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Extract from the Political Code.

SECTION 2296. Books may be taken from the Library by the MEMBERS OF THE LEGISLATURE, DURING THE SESSIONS THEREOF, and by other State officers at any time.

SEC. 2298. The Controller, if notified by the Librarian that any officer has failed to return books taken by him within the time prescribed by the Rules, and after demand made, must not draw his warrant for the salary of such officer until the return is made, or three times the value of the books, or of any injuries thereto, has been paid to the Librarian.

SEC. 2299. Every person who injures or fails to return any book taken is liable to the Librarian in three times the value thereof.

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☞The foregoing Regulations will be strictly enforced.☜

INV. 1893.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 2, 1881.

VOLUME XLIII Number 1.

Prospectors as Trustees.

The practice of outfitting prospectors and paying their expenses while they are engaged in exploring, has been a common one on this coast. It has fallen of late somewhat into disuse, however. It was formerly a common thing for men in this city to keep prospectors at work in different sections of country for months at a time. This was specially the case in new regions where "excitements" prevailed. A certain class of miners lived for years in this way. They were clothed, fed, had a little pocket money, and sometimes small wages. In return for this they were to "locate" their patron in all claims discovered by them.

The practice, though still in vogue, is not nearly so much so as it used to be, since the men were not always proved worthy of the confidence bestowed upon them. They would locate their patron in several dozen claims, but when they found a first-class ledge they would not be so particular. We speak now of the class of "prospectors" who would come to the city for just such opportunities, and who cared more really for a steady "grub stake" than for doing any very hard work.

Suit has been commenced in the Superior Court in this city which will prove, in all probability, how far prospectors are liable for agreements they enter into to locate those who pay their expenses in the claims they find. The suit is by Joseph S. Emery against Guadalupe Mason, executrix of the estate of Charles G. Mason, deceased, *et al.*, on a complaint which alleges that Charles G. Mason died July 29, 1878; that in August, 1863, plaintiff and deceased entered into a contract whereby plaintiff furnished deceased $500 in money, tools and provisions for a prospecting tour, to locate, buy and become interested in mines of gold and silver, in consideration for which advance he was to give to plaintiff one-half of all the proceeds of such tour; that deceased proceeded to the Florence mining district, Pinal, Arizona Territory, and located and took up the Silver King mine, with others, his interest being one-half the mine; that in February, 1877, he returned and sold his interest to James M. Barney for property on Market street, near Ellis, valued at $200,000. Plaintiff alleges that under the contract all the acts of deceased were performed as trustee for plaintiff, and asks judgment for an order decreeing a transfer of one-half the property, and for $18,200, as by an alleged accounting of rents and profits of the property, found to be due plaintiff.

Sutter's Mill.

The accompanying illustration will call to the minds of many pioneers of California pleasant reminiscences of those favored and long to be remembered days, the "days of '49." It represents Sutter's mill, where the first practical discovery of gold was made, which led to the "excitement" of 1849, and the immense influx of people from all parts of the world to our shores, ultimately resulting in the opening of the gold fields of the Sierras, the civilization and settlement of our State; the discovery of the unbounded field of mineral country on the Pacific Coast; and the development of the numberless resources of much-famed California, as well as adjacent States and Territories.

Sutter's mill was situated on the South Fork of the American river, in El Dorado county, for a time known as the Empire county of the State. The site was in a pleasant valley, as the engraving shows. The mill, we believe, was never completed, and the sketch shows it as it was left at that time. Among the persons who were there at the time of the discovery of gold were J. W. Marshall, E. Pierson, John Weimer, Peter Weimer, W. H. Scott, A. Stephens, H. Bigler and C. Bennett. The engraving of this historic locality was made from a painting by the late Charles Nahl, which was from a sketch made by him in 1851. The painting formerly belonged to A. Roman, Esq., but is now the property of Mr. Julius Jacobs of this city.

At the time of the discovery, Coloma contained a double log cabin and about 18 persons, exclusive of Indians. Of the history of the discovery of gold, by J. W. Marshall, we have spoken frequently, and have given a good deal of the discussion relative to the question connected with the event. It is not, therefore, necessary to repeat the facts or their reasons. The picture we give is a historical one, worthy of place in every miners' cabin.

SUTTER'S MILL, WHERE GOLD WAS FIRST DISCOVERED IN CALIFORNIA, JANUARY 19, 1848. FROM A PAINTING BY NAHL.

MINING ACCIDENT.—A very sad accident took place recently at the Delano mine, Tulare county, by which the son of Louis Latroadec, of this city, narrowly escaped with his life. The young man was employed as machinist at the mine, and had descended into the shaft for the purpose of oiling the machinery. This done he came to the surface, and in walking across the plank placed at the mouth, it turned and precipitated him to the bottom of the shaft, a distance of 96 ft. Both his legs were broken by the terrible fall.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Proofs of the Existence of at Least Two Inter-Mercurial Planets.

Editors Press:—You probably havs seen a long communication the *Alta California* kindly puhlished for me, Friday, Jnne 10th, relative to inter-Mercurial planets. The accompanying article is a kind of condsnsation and extsnsion of it to Vnlcan's position, May 17, 1882, during the total solar eclipss as well. The letter rsfers to a correspondence witb M. Aymer de la Baume, in Paris, who is preparing a work on intsr-Mercurial planets. His proofs of the existence of at least two. His distinction of the Lsscarbault-Lsverrier planet of March 26, 1859, from the Lichtenburg planet of November 19, 1762, and its re-observance by Mr. W. G. Wright, October 24, 1876, at San Bsrnardino, Califoruia, and identity with Hofmann's planst, 1764, Scott, June, 1847, and Ritter and Schmidt, June 11, 1855. Want of dates or periods of apparent revolutions in M. Baume's letter. My computations of what they may be to harmonize the whole series, ahout 33.785 days. Also, with the late Prof. Watson's observations, regarded by M. Gaillot near its inferior conjunction during the total solar eclipse of July 29, 1878. The computation continned to a possible transit next September 19th, at 4:31 A. M., (say six honrs duration before and after), but more probably October 22d, 11:21½ P.M., or not until April 9th, 5:45 A. M., 1882. Position of Wright's Vulcan or the Litchtenberg Vulcan of Novemher 19, 1762, on or at May 17, 1882, during the next solar total eclipse, probahly ahout four and a half days past its inferior conjunction, but hetter situated than when observed hy Prof. Watson, July 29, 1878.

While M. de la Baume has no hesitation in coupling Mr. Wright's California observance of October 24, 1876, with Lichtenhurg's, Novemher 19, 1762, as well as Hofmann, May, 1764 (withont specifying date) and Scott and Wray, June, 1847 (also without date), and Ritter and Schmidt, Jnne 11, 1855, he regards it as impossible to unite them with the series of Fritsh, Octobar 10, 1802; De Cuppis, Octoher 2, 1839; Lescarbault, Marcb 26, 1859, or Lummis, March 19, 1862, justly remarking that the planet was evidently at or near one of its nodes in each case, and would he again about six months before and after. Leverrier, I believe, laid down that rnle in regard to Lescarbault's planet, March 26, 1859, the corresponding date being September 24, 1859 or 1860, for a prohable transit then. He adds that "it is true that transits can occur when the planet is not quite at its nodes, bnt the distance cannot he very great, otherwise the Vulcanian orbit would he scarcely inclined upon the ecliptic, and then the transits would become so common that they ought to be frequently observed. M. Baume also remarks that to make the observations of 1859 aud 1876 agree, we must admit that in 17 years the displacement has been 30 days, or from September 24th to October 24th, which is hardly admissible, considering that Mercury and Venus can't produce such a perturbation in the inter-Mercurial planet's motion. Venus only shifts its nodes one day per century. The other transits of supposed inter-Mercurial planets lead us to think that the nodes are shifted *backward* instead of *forward*, as the following table will show, he thinks:

Date.	Observer.	The planet at the Nodes.
1802, Oct. 10,	Fritsh	Oct. 10 and April 11.
1839, Oct. 2,	DeCuppis	Oct. 2 " April 3.
1859, March 26,	Lescarbault	Sept. 24 " March 26.
1862, March 19,	Lummis	Sept. 17 " March 19.

"So that in 1876 the transit ought to occur before Sept. 17th or hefore March 19th to be identified with Lummis' and Lescarbault's observations." M. de la Baume may he right about that, but the amount of displacement is not quite so clear, for, as we may observe that from March 26, 1859 to March 19, 1862 there is absolutely *seven* days in *three* years. How much might there he in 17 years, or from 1859 to 1876? Instead of only 30 days it seems to make 39.666 days. I do not wish to intimate that it may he so. But then again observe that from 1802 to 1839 the displacement is from October 10th to Octoher 2d, which is seemingly backward only eight days in 37 yeare, but if forward, is 357 days in 37 years, while three years as above seemed to call for seven days displacement in the Lescarhault-Lummis interval.

The same proportion would require 86½ days displacement in 37 years, instead of 357 days, which the dates make it. That inquiry evidently requires some other explanation, therefore; hut however iuteresting to students, it rather led me away from the object of my letter to the *Alta California*, which was to *show the apparent period of Vulcan's revolutions*. I therefore omitted all reference to the seeming discrepancy ahout the displacement. I mean the apparent period in connection with the Lichtenhurg, Hofmann, Scott and Scbmidt observations, bronght down to Wright's observation of transit, Oct. 24, 1876, and if possihle to Prof. Watson's, of July 29, 1878. As a Californian I felt proud, as I did in 1876, of Mr. Wright's success, and now again that the Frcnch astronomer recognized tbat it supplied one of the links in the series heginning with Lichtenburg, 114 years ago; M. Leverrier indssd traced a series hack to soms time in 1750. (I never conld find ont what date, although, perhaps, taking some of his hypothetical periods, I might have compnted it.) Iu the present consideration of M. de la Bsume's remarks, I preferred to see what results I ond obtain from the data he affordsd me, and I proceedsd as follows: I first noticed the long interval from November 19, 1762, to Schmidt, June 11, 1855, which I made ahout 33,784 days, and then from Jnne 11, 1855, to M. Wright's, at San Bernardino, Octohsr 24, 1876, making 7,806 days; hut not having the clock time in 1762 or 1855, and as it was not likely to be identical, and it was desirahls for the psriods to accord as nearly as possible in working np the two intervals, I assnmed the long one at about 33,785 days, and shorter one at 7,805 days. Then the formsr might he divisible by apparsnt periods of 33.785 days, and the latter by 33.787878 days. Such a prssumption did not sesm unlikely in view of ths prohable fact that rather irregular periods may bs caused by Mercury's perturbations.

The next point was to gct the Hofmann interval, but here I was at a loss for date, so, taking periods of 33.785 days from Novemher 19, 1762, it gave me May 11 or 12, 1764, for Hofmann. If that shonld happen to be near correct, it will he highly satisfactory. I took 16 periods for the trial. Then with regard to Scott's transit, my notes from the *American Journal of Science* for 1860, Vol. 29, page 296, gave *about mid-summer* for the date in June, 1847. Now, while June 24th is regarded as mid-summer in England, 86 periods of 33.785 days each, backed from June 11, 1855, would take us to Jnne 27 or 28, 1847, which again may he nearly correct; and in that case, of conrse, just as satisfactory as Hofmann. But in either case some allowance may be prohably due for irregularity of Vulcanian periods. Assuming therefore, that 33.785 days might approximately fit these several intervals, I proceeded to try it npon the interval from Wright's observation to Prof. Watson's, or from Oct. 24, 1876, to July 29, 1878. And here again I fonnd approximate accord in the apparent position Prof. Watson found the planet, ahout 2° from the snn, provided we may incline to Gaillot's interpretation of the Lsverrier formula, requiring the planet to be *near the inferior conjunction*, instead of *superior* conjunction, as Prof. Watson supposed it was at the time. I have not yet, of course, seen the detailed report which be or his representatives submitted to Washington recently, but my present hypothesis would put the planet a little more than one day past the inferior conjunction. (The report I see affirms two new planets).

The same periods would make a conjunction to have occnrred a few days since June 9th or 10th, and carry us on to next September 19th or October 22d for possible transit, or not until April 9, 1882. In my computation I have assumed that Mr. Wright's transit was about central at 2 P. M., October 24, 1876. His observation was not made until 3 P. M., and again at 5 P. M.; but at 3 P. M. the diagram in the *Scientific American*, of November 18, 1876, shows the planet had passed the center of the sun at—say ahout 2 P. M., which would make the clock-time for September 19th, 4h. 31m. A. M., or October 22d, 11h. 21½m. P. M.—the latter heing so near the 24th or Wright's anniversary of transit, makes it the most prohable interval for a transit if it can occur this year. [Note.—*Nature* of October 26, 1876, said Leverrier considered a transit possihle in September or October, 1881, (see Paris Academy of Sciences), or not until 1883 or 1885,—see also, *Scientific American*, November 18, 1876.] I make the clock-time for April 9th, 5h. 45m. A. M., San Bernardino time, or six hours hefore and after duration of transit, if a transit at all, or rather csntral one, May 17, 1882, is, I believe, the time for the next total solar eclipse, althongh the nautical almanacs not having reached the State Library, I have seen no particulars of it or diagram, which I am anxiously waiting for. At that date, however, my hypothesis makes the planet to have passed its 60th revolntion from October 24, 1876, ahout four and one-half days, which should afford a better observation than Prof. Watson obtained during the total solar eclipse of July 29, 1878; but, as yet, I bave not learned where the total eclipse will be visible best. [Note.—*Nature*, June 2, 1881, says at Teheran, Egypt, at the Indo-European telegraph offices.] I trust the State Library will soon receive the almanacs, which are long overdue. Of course tbese remarks do not pretend to he conclusive, hut they indicate very satisfactory accord with 119 years of records, or if extended to the year 1750, would make whole periods agree with any of the following dates: December 13th, Novemher 10th, October 7th, September 3d, August 1st, June 27th, May 25th, April 21st, March 18th, February 12th or Jannary 9th. Probably November 10th, or May 25th would best accord with the planet's nodes in connection with the assumed periods of 33.785 days. I would like very much to know what date in 1750 Leverrier had reference to, which was noticed in the *Scientific American* of Octoher 21, 1876. Indeed, I would he very glad to see the details of the 30 observations there alluded to about which time Leverrier computed revolutions of 28.00774 days sidereal, I presume, and with reference to Lescarbault's planet of March 26, 1859.

A. F. Goddard.

Sacramento, June 13, 1881.

Note on Treeless Prairies.

At a late meeting of the Academy of Sciences, of Philadelphia, Mr. Thomas Meehan remarksd that the absence of timhsr or arborescent growth on the grassy prairies of America still continued to hs a matter of controversy, hut he bslieved that in the light of accumulating evidencs we might now come to a positive decision in regard to the question. The most prevalent hslief had been that tress would not grow on these prairies, and we have had theories relating to soil or climate to show why they could not grow. Then tbere were others who believed that trees did grow there in ancient times, but had been burnt off, and kept burnt off by annual fires.

Mr. Meehan considered in detail the anthors who had propounded various thsories, and the distinguished men who had advocated them, and said that it was evidsnt climate could have nothing to do with the question, because in these prairie regions there were oftsn large belts of timber lands, projected like hnge arms into the grassy rsgions, with prscisely the same climatal conditions ovsr both. That the soil was not unfavorable, was proved now by the artificial plantations everywhere snccessful, and that the soil was unfavorable to the germination of tree seed, as suggested by Prof. Whitney, was on the face of it untenable, from tbe fact that it requnired bnt the same conditions for the seed of trees as for those of herbaceous plants, the number of species of which on tbe prairies was well known to be very large. Another great gain to our present knowledge was that since the annual firing of the grassy prairies had been discontinued by tbe advance of civilization, the timber was everywhere encroacbing on them. Among the facts wbich he offered in proof of this, was a reference to page 505 of tbe seventh "Report of the Geological Survey of Indiana," where Dr. Schenck shows how land which was once grassy prairie is now covered with a luxuriant growth of forest trees; to the evidence of Major Hotchkiss, Geologist of Staunton, Vir., that the Shenandoah valley, now heavily timbered, was clear of trees in the early history of Virginia; to the discovery of buffalo bones in caves near Stroudsburg, Pa., by Dr. Josepb Leidy, now a timbered region, the huffalo ouly existing in open, grassy countries;* and to various traditions of settlers in some valleys now timbered that the land was originally clear of trees. He pointed out that in all known parts of the United States at the present time, except the arid regions, where only drought-loving plants could exist, the natural result of freedom was the succession of forest growth. Seeds were scattered by winds or animals over acres of cleared land. If sucb land became neglected, these, again seeding in time, extended the forest area continually. The tallest growing vegetation, like trees, crowded out the weaker, and the forest naturally crowded out the lower growing and weaker herbaceous plants. He illustrated this by reference to the neglected cotton-fields of the Southern States.

From all this, tbe speaker said that it was evident that there was nothing in nature, either now or in the past, to prevent the gradual encroachment of the forest over the grassy plains; till long before the white man came here the whole would have been completely covered by arborescent growth. Were there any artificial causes equal to the exclusion of trees, and yet permitting an herbaceous growth? If we were to sow a piece of land in the autmnn with some tree-seed and some seeds of annuals, the latter would be up, flower, mature and scatter their seed to the ground before the next autumn, and many of these seeds would he washed into the earth, or drawn into the earth by insects or small animals. But tree-seed would make young trees, which would not again produce seed for 10 or more years. If now, at the end of this first season, a fire swept over the tract, the seeds of the annuals which had found a slight earthly protection would come up again the next summer, again seeding and extending the area. The trees wonld he burned down, and, though perhaps many would sprout, successive burnings would keep them confined to one place. In short, under annual burnings, herbaceous plants could still increase their area annually, but trees conld never get far beyond the line they had reached when the annual fire first commenced. There could be no doubt that an annual burning in a tract destitute of forest growth, would certainly prevent the spread of timber, or of any plant that required more than a year to mature seed from the time of sowing. Now, if we look at the actnal facts, we find that the Indians did annually fire the prairies.

Father Hennepin, the earliest writer on Indian habits, noted that it was the practice in his time. There is little doubt but this practice of annual burning bas been one extending long into the past. What object had they in these annnal burnings? They must have known that the buffalo and other animals on which they were largely dependent for a living, throve only on huge grassy plains, and that it was to their interest to preserve these plains by every means in their power. Low as their power of reasoning may be, they could not hut have perceived that while grassy herbage throve in spite of fires, perhaps improved under the fiery ordeal, tress could not follow on hnrned land. What could he more natural than that they would hurn the prairies with the object of retaining food for their wild animals? If we have no difficnlty in reaching a positive conclnsion so far, we may now take a glance at the early gsological times. Mr. Meshan then referred to the researches of Worthen, Whittlesley and others, in Ohio, Illinois and other prairie regions. On the retrsat of ths great glacier, ths higher land and drift formation were probahly high and dry long hsfore the immsnss lakes formsd from the melting and turhid waters ceased to he.

It was tolerably well understood tbat many spscies of tress and other plants which required a tempsrate atmosphere, retreated southwardly with the advance of the glacier, and advancsd to higher latitudes on the glacier's retreat. Thus thsss bigher ridgss would become timbered long hsfore the lower lands became dry. Evidsnce accumulates that man existed on this continent, in the far west, not long after the glacier retreated, though "not long," in a geological sense, may msan many hundreds of years. The lakes of glacial water would gradually become shallowsr from highor land, from ths wearing away of rocky brsastworks as in Sonth pass, Illinois, as well as from the opsnings which would continnally occur from nature's over varying plan of streams under ground. In all events, the drying of these lakes would bs from their outward edges first. Aquatics would give way to marsh grasses, and these to vegstation snch as we now find gensrally spread over the prairie region. If now we can conceive of human hsings such as we know the Indian races to be, already in more southern latitudes—haviug learned the fact that firing would keep down trees and aid in the preservation of the chase—following the retreat of the glacier to the higher lands, and still as they advanced northwardly, firing the plains up to the water's edge, it would certainly account for the absence of arboreal vegetation from these immense lacustrine lands from the very beginning of their formation. Of conrse with this view we should have to look for some evidences of man's existence, both on the lands which were once under water, as well as those which were timher lands at his first appearance there. He did not know how many such evidences have heen or may he found. Man's traces in the past are at hest but rare, and they would naturally be much more scarce in the lacustrine regions than in lands dry at the same epoch. At any rate, this part of his remarks, he said, must be taken as mere speculation; but, as we could see on the basis of sound scientific investigation why there could be no trees on these grassy prairies within the range of indubitable history, it was a fair inference that some such cause had continued from the heginning; namely, that annual firee had ever been the reasou why arborescent vegetation bad never had an existence there.

* Since these remarks were made, it has been brought to the attention of the author, that the bones may have belonged to the wood huffalo.

Our Northern Counties.

Our inland exchanges are talking a good deal of railroad just now, but there is one idea that they seem entirely to overlook—a cross country railroad, conuecting the northern end of California with Humholdt bay. While railroad connection with the metropolis is desirable, perhaps, beyoud all other internal improvement, yet we are deeply impressed with the very important matter of opening a more intimate commnnication hetween our Northern California counties. And there is a principal involved that should earnestly engage the minds of all progressive and enterprising men whose interests permanently lie in the seven northern counties of California, namely, Del Norte, Siskiyon, Modoc, Lassen, Shasta, Trinity, and Humholdt, and to a certain extent, the adjoining territory of Oregon and Nevada. So long as these counties remain simply segregated tributaries of the metropolis of San Francisco, their progress and prosperity will be limited to the mere habit of tributary provinces. To connect with San Francisco will he good in many things, but when the people of the iuland counties become subject to a single line of transportation, the exactions of a single and great corporation, they will learn that there must be an offset to halance, an outlet which will he an alternative, and which will govern and regnlate the power of the carrying traffic. Humboldt bay offers far better advantagss as a shipping port tban any point on the California Coast outside of San Francisco, and while we do not wish it for a moment to be understood that we suggest it as a rival for San Francisco, yet we do suggest and propose it as a secondary port, for the use, convenience, and accommodation of this great northern couutry. We see nothing to prevent the feasihility of such a theory, and everything to urge in its favor. The carrying out of intercommunication would at once make our northern counties mutnal in their intercsts and retro-active in their influence upon one another. The area comprises a territory of fertile valleys and wooded mountains. It contains rich mines and navigable rivers, and while it is the healthiest part of the globe, and is productive in the highest degres, yet the lack of intercommunication leaves each little locality, however rich within itself, in comparative isolation. Northern California must awaken to the fact that she is posessed of all that could he required to make a community great, hut that iu order to develop we mnst cultivate a mutual sympathy, interest, and relationship between our different sections and counties and propose and demonstrate some mutnal scheme for advancement and development.—*Eureka Standard.*

MECHANICAL PROGRESS.

Malleable Cast Iron.

Malleable cast iron is cast iron simply heated to a limited degree, the heat continued for a greater or less time—from 2 to 8 days, according to the thickness of the castings and the perfectness of the work desired—and then allowed to cool very gradually.

The first authentic recognition of malleable iron was at the fair of the Franklin institute, in the summer of 1828, where a general assortment of buckles, bits and some other small articles were shown as "annealed cast iron." Since that time the business has grown rapidly and become one of great mechanical and commercial value.

Wrought iron is sometimes annealed, as when designed for special purposes; but the heat for such purpose is not continued so long, or the cooling done so gradually. The harder the cast iron the longer the heat must be continued to soften it. An imperfect process is practiced, much after the manner of annealing glass, by simply placing the articles in the hottest end of a long furnace, and gradually drawing them to the cooler extremity. But a thorough process of annealing cast iron is by packing it in iron boxes, with ordinary quartz sand, in such a way that no one article can come in contact with another. The heat must not be sufficient to fuse the sand, nor even the sharp corners of the metal subjected to the annealing process.

The only known office of the sand is that of a vehicle whereby the heat is communicated to the iron, and to retain the same at an equitable temperature. Yet, when, in addition to softening and rendering malleable the iron, it is desired to effect certain changes in its texture and workable qualities, forge scales must be used instead of sand. Why so is among "The Mysteries of Metals" elsewhere alluded to in these columns. Forge scales are oxide of iron; but oxide of iron produced by "rust" will not answer the purpose any more than will sand.

"The explanation of the process of annealing depends upon the theory of heat which may be adopted. According to the immaterial theory, the particles of iron or glass are placed by the high temperatures of preparation in a peculiar condition, opposed to the attraction of cohesion; the cohesive force being restored by the modified application of heat in the annealing and tempering process."

It is sometimes claimed by manufacturers of annealed iron articles that they are tougher than those made of steel, and not as much affected by cold or jarring as that metal.

Malleable cast iron is confined to articles of only a moderate thickness. A piece of cast iron six in. in diameter could not be rendered malleable to the depth of over one and one-half in. at most; so that, practically, malleable cast iron is confined to a thickness of only about two in.

Time was when much more was claimed for the possibilities of malleable iron than is now admitted. Experience has proven that it trenches very little on the province of wrought iron; but that it has somewhat enlarged and considerably improved the uses of cast iron. It has been claimed that it could be forged and welded—even to steel. This may be in part true, but has never become economical. The possibilities of iron, in all of its forms, are still far from being fully known.

STRAIGHTENING SHAFTS.—A correspondent of the *Blacksmith and Wheelwright* asks how he can straighten a lathe-finished shaft, four inches in diameter and three ft. long, without damaging it by hammer blows. The editor of that journal answers as follows: "I would try this way: I would get a hard-wood plank or timber the length of my shaft, heat the shaft as hot as I could and not scale it; lay it on the piece of hard-wood plank or timber, crowning side up; take another smaller piece of hard wood and put it on the shaft, end up, and then let some one strike with the sledge hammer on the end of the small piece." Another correspondent of the same journal suggests the following method: "Let him get his bent four-inch shaft red hot, rest it horizontally level by pieces placed under each end, and apply water to the rounding side of it. This will contract that side. When the shaft is black hot about one inch deep, get it red hot again as before and repeat the operation, and so on. This is a wrinkle worth knowing, for it will straighten a shaft of any diameter without damaging it by blows."

NEW TELEPHONES.—A new acoustic telephone has been recently introduced by E. F. Edgecomb, of Mechanics Falls, Maine. When in connection with the compound wire, of three strands, which is also made by Mr. Edgecomb, conversation can be easily carried on. The ticking of a clock 20 ft. from the instrument can be heard at the other end of the wire, the diaphragm of the instrument is so sensitive. We also learn from a Boston journal that Prof. Dolbear, of Tuft's College, Medford, Mass., has invented a telephone that promises a great improvement over those in general use, and immunity from many of the chronic disorders of present systems.

Balancing Car Wheels.

In a recent issue of the *Railroad Gazette* attention is called to the importance of

Balancing Car Wheels,

And the following example is given to show the effect which follows if car wheels are out of balance: On the Philadelphia, Wilmington and Baltimore railroad, some time ago, one of the cars was a frequent subject of complaint on account of its irregular motion or "rough riding." The springs were examined, and, we believe, replaced with others; at any rate no fault could be found with them, and no improvement resulted in their change. Finally the wheels were taken out and new ones made by a different maker put under, when, to the surprise of everyone, the motion of the car from being very rough became very smooth. This led to an investigation by Mr. Lungren, the master car builder of that line, when it was discovered that the old wheels were very much out of balance, whereas the new ones were in an almost perfect state of equilibrium. This led him to make the following experiment.

He constructed a rectangular wooden frame large enough to take a pair of wheels inside of it. On each side he put a set-screw with a point like a lathe center, which was screwed into the center of an angle so that the latter could revolve freely. The pair of wheels and axle to be tested were placed in this frame and held by the set-screws described. The frame was then placed on rollers, about 2 or 2½ inches in diameter, which rested on a fixed frame. A rope was then wound around the axle, and a number of men then took hold of this and pulled it rapidly, as in spinning a top, so as to cause the wheels and axle to revolve rapidly. When the whole rope was thus unwound and the wheels were revolving with a speed of about 150 revolutions per minute, it was found that the degree of unbalancement—to coin a word—was indicated by the horizontal oscillations of the frame on the rollers. If the wheels are in equilibrium, the frame remains stationary when the former are revolving. There can be very little doubt that unbalanced wheels have very much to do with the smoothness of the motion of cars, and probably if car builders would repeat the experiments described above the fact would be impressed upon their minds as it could not be in any other way. It seems to be quite as important to test the equilibrium of cast iron wheels as it is to "pair" them, or measure their diameters, so as to get wheels of the same size in the same axle. The *Railroad Gazette* suggests that the experiment could be made more satisfactory if the movable frame, instead of resting horizontally on the rollers, was suspended vertically, so as to swing freely, like a pendulum. The rope could be carried over a pulley attached to the floor immediately under the wheels, and when the former was unwound the frame could swing with perfect freedom.

PHOTOGRAPHY IN MECHANICS.—Seal skin leather and leather manufactured from the boa and alligator, and goat skin is coming into considerable demand. The leather of the alligator presents a patchwork of raised squares; that of the boa, net work of diamonds, while that of goat skin presents corrugated lines crossing at acute angles. But this last surface is produced by a mechanical process called "pebbling." The leather from seal skin has a fine arabasque surface, very attractive and much employed in the manufacture of such fancy articles as pocket books, diaries, etc.; but as the genuine article is very expensive, the photograph has been called into use to assist in the manufacture of a similar material from ordinary leather. A photograph of the surface of the finished seal skin is taken upon a zinc plate, the plate submitted to etching acids, and the etchings deepened and dressed by the graver, when the plate and the imitation leather are passed between rolls and the imitation completed.

INDUSTRIAL INNICATIONS.—The arrival of gold in the United States from Europe is as great in proportion as is the arrival of immigrants from the same quarter. The United States have such vast resources of production that we are fast draining Europe of her surplus gold and of her best blood and muscle. We have cotton, which must be used to clothe toiling millions, and of late years we have been supplying food in immense quantities from the Western States and from the Pacific coast. Every year now but makes more manifest the grand destiny which is in store for the inhabitants of the most favored people in the world.

FIRE PROOF MATERIAL.—There is practically no such thing as a fire-proof building. Brick comes nearer to being a fire-proof material than any other substance. Iron is treacherous and almost worthless in many places where it is used. A good oak pillar is far better as a support in case of fire than iron. None of the building stone generally in use is of any value in case of severe fire, and granite is the worst, or least reliable.

TO REMOVE GEAR WHEELS.—To get a gear wheel off a shaft, upon which it has been shrunk, take it to the foundry and pour some melted iron around the hub, and it will heat and expand so quickly there will be no time for the shaft to get hot, and the gear will come off easily.

TELEPHONES.—It is stated that there are now over 200,000 telephones in use in this country. At the beginning of 1879 there were only 12,000; a year later, 50,000.

SCIENTIFIC PROGRESS.

The Mysteries of Metals.

Notwithstanding the wonderful progress that has been made during the last half century in regard to the constitution and working of the useful metals, there is yet a vast deal to be learned. The metals when pure are commonly supposed to be simple elements, yet there are some reasons for supposing that it may yet be proven that at least some of them are compounds. Even the great Faraday gave utterance to the thought that the dreams of the alchemists might yet be realized—that gold and other metals might be found to be compounds and that means might be devised whereby those compounds might be seperated, and afterwards so differently re-united that the baser metals might be converted into precious.

The changes which are wrought in iron and steel by converting, annealing and hardening processes are far from being understood by the most advanced metallurgists of the present day. The mysteries of hydrogen gas and its intimate relations with iron are as much a puzzle as they were 50 years ago, and the theory advanced by Graham that hydrogen itself is a metal is still maintained by many chemists.

It is only a few years since that absolutely pure iron became known to scientists; and it is now shown to be a metal almost as "unstable as water," and still found only in the laboratory as a great curiosity. What had previously been known as pure iron, was shown by Jacobi to be a compound of iron and hydrogen. He first separated the two so-called elements. During the process the iron increased in volume, changed from a dark to a silver white substance, very ductile and so soft as to be nearly as readily cut as lead. This experiment proved that hydrogen played an important part in hardening and tempering steel—as much so as carbon—but how or why none know to this day.

It is said that much more difficulty is found in rolling, and otherwise manipulating, gold in a factory where much electricty is generated by the action of machinery than in a room where no machinery is in operation, and where, consequently, frictional electricity is absent. The trouble is manifested in a disposition of the edges of the plates or thin bars to crack.

Many other peculiarities, already known, might be mentioned, and there is no doubt that closer observation will still largely increase the number of curious and as yet inexplicable phenomena connected with the working and general characteristics of the metals, both useful and precious.

SOUND FROM INTERMITTENT LIGHT.—Prof. Graham Bell and Mr. Sumner Tainter have continued their researches in this new field of inquiry, and, stimulated by the results obtained in Europe by Messrs. Rontgen, Tyndall, Mercadier and Preece. They have just submitted to the National Academy of Arts and Sciences a most interesting paper. They endeavor to sustain their original proposition that sonorousness, under the influence of intermittent light, is a property common to all matter, and have verified all the facts obtained independently in Europe, proving further that color has a marked influence on the effects. They have reproduced speech by the action of radient energy on lamp-black, using the powerful rays of the Washington sun. They have also replaced selenium in the photophone by a peculiar form of lamp-black cell. Moreover, they have introduced a new instrument called a "spectrophone," by which absorption spectra can be examined in the ultra-red region as well as throughout the whole spectrum by means of the ear, instead of by means of the eye, as in spectroscope. Although the ear cannot compete with the eye in the examination of the visible part of the spectrum, it becomes invaluable in examining the visible parts. The new instrument is a very promising addition to the physicist's laboratory.

ALCOHOL IN NATURE.—A paper on the presence of alcohol in the earth, in water and in the air, was recently read before the French Academy of Sciences. The author, M. Muntz, has developed the method depending as the change of alcohol into iodoform, so that one-millionth of alcohol in water can be detected. Alcohol is found in all natural waters except very pure spring water, and in greater quantity in snow. Rain water and the water of the Seine contain about one gramme per cubic metre. Alcohol, no doubt, also exists as vapor in the atmosphere. In soils, especially those which are very rich in organic matter, there is a considerable quantity. The wide diffusion of alcohol in nature is due to the destruction of organic matter by various agents of fermentation.

VIBRATIONS FROM MACHINERY.—The French society for the encouragement of national industry, which offered a prize of $400 for the invention of a means for deadening the shocks and vibrations to buildings caused by steam hammers and other heavy machinery, awarded one-fourth the amount for a device which consisted of introducing India rubber plates between the foundation of the machine and the floor.

Mind and Brain.

Aristotle regarded the heart as the seat of the "rational soul." The brain was looked upon by this prince of philosophers as a comparatively useless organ, whose only function was to cool the heart. According to the latest opinion of scientific authorities, the functions of the mind are performed in the rim of gray matter of which the outermost layer of the brain consists. There sensation ends and thought begins. There are the "end-stations" where the messages from the outside world are delivered, and whore volitions originate. But though anatomists have succeeded in following the trail thus far, and have, so to speak, cornered the mind and driven it into close quarters, they seem as far as ever from seeing the mind itself or from learning what it is.

Mental science is as distinct from physical science to-day as it ever was. The nerves are excited by motions. These motions are delivered to the brain, and there become transformed into things as different from the motions in which they originate as light is from darkness. The nerve of the eye when excited causes the sensation of light. This excitation may be produced by undulations of the luminiferous ether, by electricity, by congestion, or by a blow on the head; in every case the message along the nerve is, in the brain, translated into the sensation of light. The messages delivered by the nerve of the ear are translated into the sensation of sound. But these various sensations are altogether different from the physical excitements producing them. So also are the thoughts and volitions radically different from the sensations.

WHAT WE EAT.—Prof. Leidy, in a communication to the Philadelphia *Ledger* of April 9th, on the subject of "Trichinæ, Disease Germs," etc., gives, as appropriate to the subject, the following: "Some years ago, while in Charleston, S. C., at an entertainment, among other dishes served was one of the tail of a drum fish, in nicely browned slices. The writer was helped to a piece, said to be particularly gelatinous and delicate. These qualities seemed to depend on a jelly-like substance imbedded in the flesh. Curious to know its meaning, the next day a drum fish was procured from the market, and on dissection of the tail, it was found to be due to a huge parasitic worm, coiled into a mass nearly as large as a hen's egg." Prof. Leidy was the first to discover the trichinæ parasite in the hog, which discovery he announced in 1846. He discovered it in some meat upon a portion of which he had dined. His attention was attracted to a curious looking minute spot which he saw upon a slice of meat upon his plate. He laid the meat one side, and a microscopic examination led to the important discovery. The discovery of the parasite in man was made by the English surgeon, Hilton, in 1833, and the worm was subsequently named by Owen.

BURSTING POWER OF ICE.—Ed. Hagenbach experimented, during the past severe winter, upon the bursting force exerted in the expansion of water when freezing. Two interesting experiments were made with cast-iron hand grenades. The outer diameter was 5.9 inches, the inner diameter 5.04 inches. The shells were filled with water, closed with a screwed iron plug, and exposed to the cold. Both shells were broken, and a curved thread of ice was projected, by means of an ice column, from the upper surface. One of the plugs was evidently thrown out with great violence, and to such a distance that it could not be found. The curvature in that case was bent upward.

COLORING VEGETABLES GREEN.—M. Wurtz, the well-known French savant, describes a simple process for coloring vegetables green. It consists in the use of an excess of chlorphyl obtained from spinach, which holds in its cells a large amount of coloring matter. A watery solution of this, rendered alkaline by soda, is added to the boiling vegetable, which is slightly acidulated with hydrochloric acid. The chemical result is common salt and a deposit of coloring matter on the organic tissue. There cannot now be any possible temptation for the unwarrantable dyeing of preserved vegetables by salts of copper or the employment of adulterants for obtaining a vivid coloring.

ABSORPTION OF THE SUN'S RAYS BY THE CARBONIC ACID OF THE ATMOSPHERE.—H. Ernst Lecher, by means of observations with a thermo-electrical apparatus in connection with observations with a pyrheliometer, arrives at the conclusion that the amount of carbonic acid which has been proved to exist in the air is sufficient to cause the absorption which has generally been attributed to aqueous vapor alone. He believes also that his method is better adapted for obtaining the amount of carbonic acid in different layers of the atmosphere than the chemical methods hitherto adapted. — *Annal. der Phys. u. Chem.*

MEASURING STELLAR LIGHT.—An apparatus has been described by M. Janssen for measuring the intensity of the light received by us from the stars. It is, of course, necessary for comparative purposes that the photographs of different stars should be taken under identical conditions. M. Janssen hopes to be able shortly to obtain by this method additional data for ascertaining the relative dimensions and distances of the stars, and also additional evidence concerning the phenomena which take place in them.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending June 9.		Week Ending June 16		Week Ending June 23		Week Ending June 30	
Alpha	4¼	4.10	4¼	4.10	4	3¾	3¼	3
Alta	4¼	3.55	4¼	3.80	3.95	3.70	4.40	4
Andes	2½	2½	2.45	2.30	2.40	2.05	2.20	1.85
Alhion	3¼	3.20	3.15	3.05	3¼	3.10	4	3.70
Argenta	25c	20c	20c	....	15c	....	15c	10c
Addenda	....	....	....	....	....	....	25c	15c
Belcher	3.85	2.65	3.70	3¼	3.65	3.30	3.40	3.20
Belmont	....	....	75c	70c	1	80c	85c	....
Best & Belcher	16¾	15½	16¼	15	16½	14½	13¾	11¾
Bullion	1.05	90c	95c	85c	1.65	85c	1½	1¼
Bechtel	1.05	95c	90c	85c	1.15	95c	1½	1.30
Belle Isle	....	....	15c	10c	15c	10c	50c	10c
Bodie	7	7	7¼	7	7¼	7	7	6¾
Benton	1	75c	85c	75c	1	75c	1.20	1.05
Bulwer	3	2.30	2.90	2.85	3	2.90	2¾	....
Boston	....	....	60c	....	50c	40c	....	....
Black Hawk	20c	....	....	....	25c	10c	20c	15c
Belvidere	....	....	35c	....	25c	5c	....	....
Booker	....	....	5c	....	....	....	15c	10c
Caledonia	65c	50c	60c	50c	55c	40c	40c	35c
California	2.15	1.85	1.95	1.55	1.85	1¼	1.40	1.15
Challenge	1	95c	90c	....	1	85c	1	85c
Chollar	3.05	2.70	2.95	2¾	2.95	2.70	2.85	2¾
Confidence	4.90	4.15	4.95	4¼	4.80	4¼	4¼	3.90
Con Imperial	25c	20c	25c	20c	25c	20c	20c	15c
Con Virginia	4.90	4	5.00	3¾	3.90	3.35	3.30	2.70
Crown Point	3.45	2.30	3.10	2.90	3.05	2.60	2.45	2.10
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1.70	1¼	1¼	....	....	....	1.10	60c
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	90c	90c	....	....	75c	....	....	....
Derbec	....	....	....	....	....	....	....	....
Dav	1¼	35c	1.60	1¼	1.65	1.60	1.90	1.65
E. Mt. Diablo	25c	....	20c	15c	....	....	....	....
Eureka Con	13¼	....	33	31	32¼	32	33	30¾
Exchequer	1¼	1¼	1.60	1¼	1.60	1.35	1.40	1.30
Entderprise	....	....	....	....	....	....	....	....
Grand Prize	45c	30c	35c	20c	35c	30c	50c	25c
Golden Gate	2.85	2	3	2.85	3	2.90	2 80	2¼
Goodshaw	50c	45c	50c	45c	50c	45c	45c	40c
Gould & Curry	9¼	8¼	9	8¼	8½	7	8¼	6¾
Hale & Norcross	4.70	4.15	4.90	4.60	4.85	4.35	4.40	3.85
Head Center	1½	1¼	1½	1.20	1.80	1¼	1.65	1¼
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	20c	....	10c	....
Julia	65c	55c	60c	50c	60c	45c	55c	50c
Justice	1.10	90c	1.10	75c	1	95c	1.10	95c
Jackson	....	....	....	....	....	....	....	....
Jupiter	25c	15c	25c	15c	....	....	....	....
Kentuck	2.65	2	2½	2¼	2.65	2¼	2½	2¼
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	40c	....	....	....	....	....	....	....
Lady Wash	30c	20c	30c	25c	25c	20c	25c	20c
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	3.10	2½	2.80	2¼	2½	....	2¼	1¼
Martin White	25c	....	....	....	....	....	....	....
McClinton	....	....	....	....	....	....	....	....
Mono	2½	2.40	3	2.45	3	2.20	3.20	3
Mexican	14¾	12¾	13¾	11¾	13¾	12	11¾	9¾
Mt. Diablo	9¼	7¾	10	9¼	10	8¾	9¾	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1.95	1.80	1¾	1¼	1¼	1.30	1¼	95c
New York	20c	....	20c	15c	15c	10c	10c	....
Northern Belle	25	24	21½	18	19	17	20	19
North Noonday	1¼	1.10	1.15	1	1	60c	90c	50c
Navajo	90c	85c	85c	70c	70c	....	60c	....
Occidental	1.40	1¼	1.40	1¾	1¾	1.40	1.40	90c
Ophir	9¾	8¼	9¾	7¾	8¾	7¾	7¾	6¼
Original Keystone	....	....	....	....	....	....	....	....
Overman	1¾	1.35	1.65	1¾	1.55	1.40	1¾	1.40
Oro	65c	55c	65c	60c	80c	55c	95c	65c
Paris	....	....	55c	50c	....	....	....	....
Potosi	4.05	3.40	3.70	3.55	3.65	3.30	3.35	3
Queen Bee	10c	....	....	....	....	....	5c	....
South Bulwer	10c	....	10c	6c	5c	....	35c	5c
Savage	4.40	3.90	3.95	3.70	3.90	3¼	3.45	2.95
Seg Belcher	8	6	8¼	7	8	7	7¼	7
Sierra Nevada	20¼	17¼	17¾	15¼	16¾	14¾	13¾	10¾
Silver Hill	50c	10c	45c	25c	35c	25c	25c	20c
Silver King	22¾	22¼	22¾	21¼	22	21¼	22	21¼
Succor	....	....	....	....	....	....	....	....
Summit	....	....	65c	....	25c	....	25c	....
Scorpion	2.35	2.05	2	1.85	2	1.70	1.70	1.30
Solid Silver	45c	35c	1¼	10c	....	....	....	....
South Bodie	15c	10c	10c	....	15c	10c	10c	5c
South Standard	....	....	....	....	....	....	....	....
Syndicate	40c	....	40c	....	40c	35c	35c	30c
Tioga Con	40c	35c	60c	45c	75c	60c	65c	60c
Tiptop	3.90	3¼	3.05	2.90	4.95	4	4.05	3.80
Tuscarora	25c	....	30c	....	30c	....	30c	....
Union Con	16	13¾	16	12¾	16	12¼	12¾	9¾
Utah	12	10¾	11¾	9¾	13	10¾	10¾	8¾
Ward	2¼	....	2¼	....	....	....	2¾	....
Wales	2	1½	1¾	1.60	1.60	1¼	1¾	1.45
Yellow Jacket	6	4.45	6¼	5¾	6¼	5¾	5¾	4.85

Sales at S. F. Stock Exchange.

Thursday A.M., June 30.

150 Andes.....1.90@1.85
1300 Alta.....4½@4.40
90 E & Belcher.....11@11½
660 Belcher.....3.30@3.35
350 Bullion.....1.35@1½
170 Benton.....1.10@1.05
1385 Con Virginia.....2½@2.70
285 California.....1.20@1.15
275 Chollar.....2.85@2.80
600 Crown Point.....2.30@2.20
40 Confidence.....4
100 Con Imperial.....15c
50 Challenge.....1
190 Gould & Curry.....8¾
200 Hale & Nor.....3.95@2.90
700 Justice.....1.10
215 Julia.....50@55c
100 Kentuck.....2½
190 Mexican.....8¾@8½
125 N Jx Utah.....90c
200 Ophir.....6¾@6¾
820 Overman.....1.65@1.70
100 Occidental.....1.40
165 Potosi.....3½@3.20
365 Savage.....2.95@3
520 Sierra Nevada.....11@11¼
150 Silver Hill.....30c
180 Scorpion.....1.40@1½
150 Sierra.....1.40
170 Utah.....8¾@8¾
1865 Union.....12¾@11¾
25 Ward.....2½
150 Yellow Jacket.....5¾

AFTERNOON SESSION.

300 Argenta.....10c
300 Alhen.....3½@3.80
400 Bechtel.....1.70@1¾
100 Black Hawk.....15c
105 Bodie.....7@6¾
200 Belle Isle.....10c
400 Booker.....15c
200 Concordia.....60c
500 Day.....1.65
400 Grand Prize.....50c
400 Giant & O A.....1¾
100 Head Center.....1.65
60 Holmes.....30c
75 Mt Diablo.....9@9
100 Manhattan.....1¾
115 Mono.....3.20
200 Navajo.....60c
50 Northern Belle.....19½
200 Noonday.....1@95c
750 N Noonday.....50c@60c
1050 Oro.....95@90c
50 Summit.....25c
350 Syndicate.....30c
300 S Bulwer.....35@30c
200 S Bodie.....10c
260 Silver King.....21¾
150 Tiptop.....3.95
200 Tioga Con.....60c
450 Tuscarora.....25c
200 Wales.....1¾

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

PHIL SHERIDAN CON. M. CO.—June 29. Capital, $10,000,000. Directors—John A. Robinson, G. W. Bennett, Arthur F. Carmody, Cortlaud G. Walker, John F. Hennessey.

HOWARD SPRINGS IMPROVEMENT.—The proprietress, Mrs. Carrie Hiesch, is having a large dwelling house completed, near the hotel, for the accommodation of the increasing patronage of these favorably-known aprings, near Lower Lake.

THE accommodations at Siegler aprings are to be increaed by the addition of a commodious office and reading saloon.

Lo! the poor Indians now make roads for tbe wheels of progress, in Lake county.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	No.	AMT. LAVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alpha Con M Co	California	14	1 00	June 20	July 25	Aug 15	W Willis	309 Montgomery st
Belle Isle M Co	Nevada	2	15	June 3	July 11	Aug 2	E M Hall	327 Pine st
Bullion M Co	Nevada	19	60	May 19	June 22	July 13	J M Brazell	328 Montgomery st
Belvidere M Co	California	11	25	May 27	June 30	July 16	C V Hubbard	310 Pine st
Equitable T & M Co	Utah	25	15	May 10	June 17	July 11	C J Collins	512 Montgomery st
Equator M Co	Nevada	4	25	June 7	July 12	Aug 1	W Willis	309 Montgomery st
Grand Prize M Co	Nevada	5	25	May 27	June 30	July 20	E M Hale	327 Pine st
Hale & Norcross M Co	Nevada	69	50	May 10	June 15	July 6	J F Lightner	309 Montgomery st
Mexican G & S M Co	Nevada	16	1 00	June 28	Aug 2	Aug 22	C L McCoy	309 Montgomery st
Maybelle Con M Co	California	8	20	June 22	July 29	Aug 22	W J Taylor	310 Pine st
Martin White M Co	Nevada	10	25	June 13	July 30	Aug 25	H L Scoville	309 Montgomery st
Mono G M Co	California	12	50	May 19	June 24	July 14	W H Lent	309 Montgomery st
Murchie M Co	California	6	15	June 10	July 11	Aug 10	S D Rogers	328 Montgomery st
Oro M Co	California	8	10	June 1	July 5	July 24	W Stuart	320 Sansome st
Phœnix M Co	Nevada	23	10	May 9	June 15	July 9	H Loeter	308 California
Tioga Con M Co	California	13	15	May 11	June 17	July 7	W H Lent	309 Montgomery
Yellow Jacket S M Co	Nevada	41	1 00	May 9	June 14	July 6	Mercer Otey	Gold Hill

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona Mexican M Co	Arizona	1	50	June 7	July 15	Aug 8	G R Adams	320 Sansome st
Benton Con M Co	California	5	25	May 21	June 24	July 12	W H Watson	302 Montgomery st
Betty O'Neal M Co	Nevada	1	50	June 14	July 19	Aug 9	R W Heath	318 Pine st
Berlhea Blue Gravel M Co	California	8	10	May 11	June 16	July 9	T Wetzell	522 Montgomery st
Eintracht Grav M Co	California	7	5	June 14	July 21	Aug 9	H Kunz	209 Sansome st
Excelsior Deep Gravel M Co	California	16	25	May 25	June 27	July 14	D B Chisholm	327 Pine st
Fresno Enterprise M Co	California	1	15	June 1	July 1	Aug 1	W H Allen	306 Pine st
Golden Gate Cou M Co	California	4	50	May 19	June 30	July 21	J T McGeoghegan	318 Pine st
Harrington M Co	California	2	5	June 15	July 20	Aug 11	I C Miller	409 California st
Holmes M Co	Nevada	2	10	June 22	July 25	Aug 15	E A Holmes	318 Pine st
Iron Clad Con M Co	California	1	1¾	May 25	July 10	Aug 10	A Dott	309 Montgomery st
McMillen M Co	Arizona	3	20	Jan 12	June 12	July 27	J Morizio	328 Montgomery st
Mount Potosi M Co	Nevada	—	10	June 9	July 16	Aug 8	J H Sayre	330 Pine st
Noonday M Co	California	3	50	June 28	Aug 3	Aug 26	Wm J Traylor	310 Pine st
North Noonday M Co	California	3	50	June 28	Aug 5	Aug 29	Wm J Traylor	310 Pine st
Oakland G M Co	California	15	06	May 3	July 2	July 19	R D Hopkins	436 Montgomery st
Paris M Co	California	2	25	June 22	July 27	Aug 17	W J Taylor	310 Pine st
Occidental Con G M Co	California	7	04	May 9	July 7	Aug 2	W T Smith	414 California st
Paris M Co	California	2	25	June 22	July 27	Aug 17	Wm J Traylor	310 Pine st
Rocky Point M Co	California	8	05	June 21	July 25	Aug 15	W G Hughes	330 Pine st
Red Cloud Con M Co	California	10	20	June 22	July 27	Aug 17	W J Taylor	310 Pine st
Steep Hollow G M Co	California	6	1 50	June 21	July 26	Aug 18	J W Pew	310 Pine st
Spaulding G & S M Co	California	2	10	June 28	Aug 23	Sept 15	J W Pew	310 Pine st
Swamp Angel G M Co	California	4	12½	June 14	July 16	Aug 4	L Little	607 Washington st
Three Brothers S M Co	Arizona	1	30	May 25	June 28	July 20	C Mesde	324 Pine st
Utah S M Co	Nevada	35	2 00	June 28	Aug 5	Aug 23	G C Pratt	309 Montgomery st
Wolverine Gravel M Co	California	2	10	May 31	July 1	Aug 1	E J Blanding	Front st
Wide Awake M Co	Arizona	13	10	June 4	July 18	Aug 10	C Hildebrandt	Cor Bush & Mont'y

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Associate Stock Brokers	S F	J W McClung	Stock Ex	Annual	July 11
Best & Belcher M Co	Nevada	W Willis	309 Montgomery st	Annual	July 11
Betty O'Neal M Co	California	R W Heath	318 Pine st	Annual	July 11
Bluebird M Co	California	W H Knight	10 Market st	Annual	July 6
Champion M Co	Nevada	J Oroskett	327 Pine st	Annual	July 12
Equitable Tunnel M Co	Utah	C J Collins	512 Montgomery st	Annual	July 7
Hillside M & M Co	Nevada	F Frankenthal	121 Battery st	Annual	July 9
Modoc Con M Co	California	J W Pew	310 Pine st	Annual	July 12
Mt Potosi M Co	Nevada	R Lowden	330 Pine st	Special	July 25
Utah S M Co	Nevada	G C Pratt	309 Montgomery st	Annual	July 12

LATEST DIVIDENDS—WITHIN THREE MONTHS

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	June 20
Father De Smet M Co	Dakota	H Dean	New York	50	June 10
Northern Belle M & M Co		Cal	Wm Willis	309 Montgomery st	50	June 16
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	June 16
Silver King M Co	Arizona	J Nash	315 California st	25	June 15
Staudard Con M Co	California	Wm Willis	309 Montgomery st	75	June 13
Western M Co	California	C S Curtiss	309 Montgomery st	75	May 12
Navajo M Co	Nevada	E M Hall	327 Pine st	25	Mar 25

Mining Share Market.

There is nothing specially now to report of the mining share market, other than our tables give. On the Comstock, on Wednesday, the hydraulic pumps started up, and were working well and smoothly at last accounts. The general feeling is that these pumps will now give no more trouble. They have been strengthened in every part where subjected to extra strain, and more air chambers have been added to reduce the shock occasioned by the closing of valves when the pumps are in motion. Nothing has been left undone that human foresight has been ahle to provide against. As yet there is no change of material in the Sierra Nevada crosscuts that is worthy of note.

It will be interesting to our mining stock friends to learn who are the new officers of the New York Mining Stock Exchange. They are as follows: President, S. V. White; Treasurer, John Stanton, Jr.; Chairman, A. W. Peters; Secretary, E. A. Wood; and Assistant-Secretary, R. H. Gallagher, Jr. Following is a full list of the governing committee, and the term for which each member is to serve: To serve one year, R. K. Cook, E. L. Clarkson, Geo. Phipps, H. Dunham, R. Weston, C. H. Badeau, H. S. Stanton, Jno. F. Scott, and G. W. Hoagland. To serve two years: P. K. Dickinson, G. B. Satterlee, J. A. McPherson, R. M. Shaw, R. P. Loonsherry, Louis Haight, W. W. Hanley, A. L. Seton, and P. P. Rohinson. To serve three yeare: R. McJimsey, Brayton Ives, J. H. Tucker, Geo. F. Mann, E. J. Munroe, E. P. Mitchell, C. F. Wood, W. C. Budd, and W. E. Cox. E. J. Mann was elected trustee of the gratuity fund, to serve five years.

MINERS' UNION.—The following officers have been elected hy the Gold Hill Miners' Union to serve the ensuing six months: President, E. O. Leermo; Vice-President, Thomas Fraser; Recording Secretary, J. D. Campbell (re-elected); Financial Secretary, Thomas Burke (re-elected); Treasurer, J. R. Connors (re-elected); Conductor, M. Murphy (re-elected); Warden, John Sullivan; Finance Committee, J. A. Judeska, M. Flannery, M. Buckley; Trustees, P. H. Gillooly (re-elected), H. W. Stokes (re-elected), T. Stephens, Edward Dougherty and Edmund Wolsh (re-elected).

THE Sierra Nevada mine produced 300 tons ore laet week, assaying $22 per ton. No dividends in that.

A STEAMER is building at Linkville for Big Klamath lake. It will he a screw propeller of 35-horse power, 60 ft. long and 12 ft. beam.

Mechanics' Fair.

On Tuesday evening another meeting of the Board of Managers of the coming Mecbanics' fair was held, and from the reports of the various committees a most satisfactory showing for the success of the exhihition was made. The announcement that $1,000 would be paid for the first successful trip of a flying-machine around the pavilion, carrying a man, has had the effect of hringing to light a numher of wonderful inventions, and an eminent professor of aeronautics has exhihited a perfect model, from whicb a large machine will at once be constructed. The identifying season ticket used this year will be desigued hy A. R. Wells, a member of the Board, and used so successfully at previons fairs. The prices of admission this year will be: Double season, $5; single season, $3; single admission, 50 cents. The display of agricultural and mining machinery in operation, combining the latest improvements in those two important elements of our prosperity, will be a special feature, for which a large and inclosed space has heen set apart. Another new triumph of California, from invention and manufacture, will he shown for the first time hy an improved steam fire-engine and a rotary engine of novel constrnction. We have been told of a number of mining appliances which are to be exhihited, more especially in the line of ore crushers and concentratore. It is to he hoped that our foundrymen will show enterprise enough to exbihit artioles of whicb they make a specialty. All these things go to make up a successful exhihition, and to attract the attention of the puhlic to our bome resources and industries.

Bullion Shipments.

We quote shipments since our last, and shall he pleased to receive further reports:

Germania, June 23d, $2,060; Hanauer, 23d, $1,580; Frisco, 23d, $4,584; Bullionville, 23d, $1,957; Ontario, 23d, $9,034; Horn Silver, 21st, $2,500; Ontario, 21et, $18,120; Hanauer, 21st, $1,550; Germania, 21st, $1,850; Christy, 22d, $1,776; Germania, 22d, $1,050; Hanauer, 22d, $5,280; Frisco, 22d, $4,222; Bullionville, 22d, $7,337; Ontario, 22d, $9,255; Horn Silver, 24th, $12,500; Frisco, 24th, $2,293; Ontario, 23d, $24,995; Germania, 24th, $2,900; Mayflower, 24th, $5,625; Germania, 24th, $1,990; Hanauer, 24th, $1,600; Christy, 24th, $1,817; Indian Queen, 21st, $4,195.58; Northern Belle, 22d, $6,852.22; Mt. Diahlo, 24th, $7,592.80; Western, 25th, $10,601.50; Bodie Con., 27th, $7,586; Standard Con., 27th, $39,298.70; Northern Belle, 27tb, $7,674.61.

MINING SUMMARY.

The following is mostly condensed from journals puhlished in tbe interior, in proximity to tbe mines mentioned.

CALIFORNIA.

AMADOR.

AMADOR GRAVEL M. Co.—Amador *Ledger*, June 24: The property of this company, which bas heen tied up by attachment suits for two months past, in the interest of the employees and other creditors, was released this week, and mining operations are to be renewed at an early date. I. Bluxome, Supt. of the company, came up Friday evening, and settled all the outetanding indehtedness, and the suite have been withdrawn.

MISCELLANEOUS.—The Pacific Gravel M. Co. is the name of an incorporated company recently organized to work a gravel deposit situated one mile north of Volcano. A strike of fine-looking rock is reported at the Fogus mine, Volcano, at the 200 level running north. The mill was started up this week. The small mill lately huilt by R. Stewart on the Amador side of the Mokelumne river, uearly opposite West Point, is expected to commence operations next week. The Volcano Gold Gravel M. Co. keeps a few hands employed in shovelling gravel into sluice-boxes, and running a small head of water. This plan will likely be continued tbrough the summer months while the scarcity of water lasts. It is thought tbat the yield from this process will he fully as satisfactory as the first clean-up with a full stream of water.

JACKSON.—Amador *Sentinel*, June 22: The mining interest has at all times been large, though it may not be in as flourishing a condition to-day as in times past. The Zeile mine is the principal one in operation. It employs about 100 men, has a fine hoisting works, a 40-stamp mill which is the equal of any in the State, and a chlorination works. We understand that 100 tons or more are crusbed per day, the rock paying fairly. The Kennedy mine, on the north side of town, is again in operation, under the superintendency of P. Reichling. The character of the rock now being taken out ie good. Considerable mining, hoth quartz and placer, is being carried on between here and tbe Mokelumne river. The veins are mostly small, hut of exceeding richness. Morgan & Co. and Nash & Co, are operating quite extensively in this district. L. N. Dewitt is also largely operating in this district, with encouraging results. The great bane of mining around Jackson, and the same may be said of other towns of the county, has been in the operations of irresponsible parties, who, hsving honded a mine on the strength of "big talk," run thousands of dollars in debt and then jump the town. Mining has so far proved the ruin of all small capitalists who have attempted to fly before their wings were festhered.

DOWNS.—R. C. Downs stated briefly that prospects never looked any brigbter. "I have," he said, "made the first run of rock from the 400 level, and find tbo results exceeingly gratifying. In fact richer than the 300 level. I employ at present between 20 and 30 men and keep 20 stamps going constantly. The length of the vein is 285 ft, with an average width of 4 ft." "Do you intend to develop it further?" "Certainly; I intend sinking a double-compartment shaft next fall and get heavy machinory.'

BUTTE.

SOLD.—Croville *Mercury*, June 24: The Loring & Leavitt claim, near Elizsbettbown, was sold last week to E. A. Corbin and party, of Philadelphia. We understand that the price was $50,000. If that amount was peld, tbe Eastern gentlemen have got their bands full.

A GENTLEMAN who has purchased a one-half interest in the Hyatt & Hughes claim will put it down to bedrock, when rich developments will probably be made. All the drift mines at Spanish peak are working in rich gravel. The Chinese claims are paying the best. All the hydraulic mines there that have water are running on full time and expect to make a big clean-up. The Monte Christo gravel mine is shut down at present. Mr. Murpby, the Supt., is absent, and the acting Supt. refuses to allow anyone to go into the mine. The great secrecy about this mine strongly suggests that there is a cat in the meal, and that something is wrong. There is probably going to be another deal in Chicago or New York soon. Chas. Cotterell, who has been running a drift under Mt. Ararat, Plumas county, says he has struck very good pay dirt. The drift gravel claims owned by Thos. Johnson and others at Buckeye, has been bonded to San Francisco parties. Terms, private. The Miocene Co. have finished cleaning up, and the Supt., Mr. Harris, informs us that it paid about as well as the first. Tuesday the men placed the riffles back into the flume, put the claim in order, and that night were discharged. There is now about 200 inches of water running through the ditch and flumes. The big tunnel in the Spring Valley mine at Cherokee is now in 400 ft. John Hyde and John Martin, of Bidwell's bar, are putting one of Martin's elevators in on Stringtown bar, and will probably be at work next week.

CALAVERAS.

INCREASING WATER SUPPLY.—Calaveras *Chronicle*, June 25: We understand tbat the owners of the North Hill mine, near Milton, are so much pleased with the workings of their new ditch recently completed, and the present outlook of their claim, that they are now having plans and estimates prepared by A. B. Beauvais for increasing their water supply by raising the dam at Salt Spring valley reservoir.

UPPER COUNTRY MINING NOTE.—Champion mine running 700 level on rich rock. Mill running steadily night and day. Rose & Jenkins are sinking the main shaft in the Henry mine under good prospects. Present depth, 100 ft. The lode shows plenty of gold to the naked eye. Furgeson & Co have commenced to sink the shaft on the Colorado mine another 100 ft as a prospect. A compressed air drill is being used in the mine. The Lone Star mine is being worked by its owners, Messrs. Reed & Hillery. Congdon & Reed are still sinking the main shaft of the Tom Payne mine, with rich quartz in the bottom of the shaft. Cross switch & Co. have crushed 10 tons of quartz from tbe Scorpion mine, which averaged $65 per ton. Staeger & Co. have struck rich rock in the Dunna mine.

WEST POINT.—Our mines continue to bold about the same. All of the present companies now working have good quartz and plenty of it. I don't hear of any complaints, on the contrary all of our Supts. are highly pleased with their prospects, and are confident tbat the West Point mining district is as yet in its infancy. Under the head of new strikes we have two, Mr. C. Reitz and Mr. L. Morse, both having found new ledges a short distance from town which prospect well. The latest feature in tbis district is the discovery of an excellent granite rock. The Colorado mine has the honor of its first use in West Point, and before long other mines of note will follow in its wake. The river beds are as usual, annually turned over by John Chinaman in search of gold, the exact proceeds of which would be hard to determine.

BRYAN MINE.—Proceeding from the Boston mine in a northerly direction at a distance of a half mile lies the Bryan, one of the best prospects of the country. This ledge was discovered by the present Supt. some time ago, but there had not been work done on it to amount to anything until recently. The work done consists of a shaft now down about 40 ft, showing a ledge 3 ft wide and rich. A drift at the bottom running west shows rock calculated to pay $75 per ton. A tunnel is being run to tap the ore body at a depth of 150 ft. Grading for a mill was commenced on Friday last, and the machinery for running 20 stamps will leave San Francisco as soon as it is necessary. A splendid two-story building has been erected on the works, to be used as an office for the Supt., clerk and foreman of the mine.

EL DORADO.

WATER.—Georgetown *Gazette*, June 24: T. F. Lewis, of Spanisb Flat, has been for sometime trying to bring about a concert of action among the miners of that camp for bringing water upon the ridge there to work a large

extent of seam and gravel ground lying above the ditch and known to contain gold in paying quantities. It will require about 9,000 ft of 22-inch pipe, besides some ditching, to supply that section with water should it prove anything like what is anticipated. The Co. propose that those interested put through a 9-inch second-hand pipe of their own, as a temporary arrangement, when water will be furnished free to test the value of the leading claims, after which, if satisfactory, the company agree to put through a large pipe and supply all the mines with water at the usual rates. The ridge in question is favorably situated in a good belt, and it is not extravagant to presume that the working of that ridge would result in the opening of a mine equal to the Nagler, Crane's Gulch, Parsons or Beattie mines. It is high time our people were laying asi de their indifference and personal disagreements in the camps all along the line, and possessing themselves with a spirit of enterprise to develop our hidden wealth, the out-croppings of which are plainly visible on all sides. We can announce that the Eureka mine of this place is a success. The developments up to this writing give us every assurance that the Eureka is one of the best quartz mines in the State. The clean-up of 50 tons of rock crushed at the Greenwood mill is being made at this writing, and experienced men who have been inspecting the crushing daily are united in their enthusiasm of favorable results. About 30 tons of the rock was from the ledge in the second level, taken from the north drift out of the lode where it was 25 or 30 ft wide, and considered to be the lowest grade ore in the mine, and tha remaining 20 tons was taken just as it laid from the dump. The value of tha sulphurata has already been determined to Mr. Baird's satisfaction, which is about $30 per ton, and the percentage of sulphurets is large. Rock now being taken from out of the mine frequently shows free gold.

GOPHER AND BOWLDER.—Mountain *Democrat*, June 25: Preparations are active for operations on a large scale at the Gopher and Bowlder mines, Kelsey District, during the present season. In addition to the work of erecting the mill, explorations of the ledge are in progress from several different points. A tunnel will be run to a point at the foot of the hill, due east of the shaft on the Gopher, from which 500 tons were recently taken, and crushed at the Chapparal mill with satisfactory results. It is safe to calculate that the capacity of the mill will be rapidly increased, and that before the first of January it will be running 40 stamps night and day on Gopher and Bowlder ore.

MARIPOSA.

MINES.—Mariposa *Gazette*, June 25: Some two miles above Hite's Cove, on the north bank of the river, is what is called Simm's Cave. In the neighborhood of a mile north of Simm's Cove, upon the mountain, is the El Carmin mine. This cove, which is situated opposite where Devil's gulch empties into the river, will probably be the spot upon which the company will construct their principal works for crushing rock by water-power taken from the river above, by means of a flume or ditch, and terminating at this point. Mr. Lyall says as soon as preliminaries can be arranged they expect to commence a tunnel at the base of the mountain, bordering upon the river, and run for the El Carmin mine, a distance of about 3,000 ft. In the course of the tunnel as contemplated, the chances of cutting blind lodes is exceedingly favorable. The Hite mine, which is at present the "astonisher" of that section and of the county generally, will in due course of time be equaled in importance by what is yet undeveloped in this gold-producing mountain.

THE FERGUSON mine and works are in running order again. Owing to a breakage of some sort, work was at a stand-still for a few days, a short time back.

NEVADA.

THE MURCHIE.—*Transcript*, June 22: The new 10-stamp mill of the Murchie will probably be started up to-morrow, as the finishing touches are now being put upon it. The mine is in a first-class condition, and under Supt. Schuyler's efficient management is being conducted in a manner that will secure the best possible results to the stockholders.

THE CHAMPION MINE.—*Free Lance*, June 20: The Champion mine is working at Nevada City, on the north side of Deer creek. The ground of this company is located between the Wyoming ground and the Merrificld mine. The Champion's tunnel is now in 1,700 ft, and last Wednesday the miners began to crosscut. It is positively known that the crosscutting will strike three or four large and rich ledges within a very few days. Work in running the tunnel has been going on for the past four years.

THE LOSS ESTIMATED.—Nevada *Transcript*, June 24: The North Bloomfield, the Milton and the Blue Tent hydraulic mines are all at a stand-still on account of Judge Keyser's injunction, produce altogether about $3,000 worth of gold bullion a day when in operation. Their loss in the matter of water, which is now going to waste, is not less than $1,000 a day. Supposing that only 60 days elapses from the time they shut down till they can start up again, what an enormous sacrifice results, to say nothing of hundreds of men with large families to support being idle all that time! And yet these are only 3 mines out of a dozen equally productive ones, and as many more small ones, that are similarly affected.

PLACER.

THE GLD SALSIG.—Placer *Herald*, June 25: Some time ago Adam Holden secured a lease of the old Salsig quartz mine, located a short distance north of town, and for several weeks he has been engaged in sinking a new shaft 150 ft west of the old works. He is down about 25 ft, and from top to bottom he has found the rock of an encouraging character. He showed us a large piece of ore the other day that fairly glittered with gold, and says that all the rock he has taken out, whether it shows free gold or not, prospects rich.

MIDDLE FORK.—There is considerable mining going on on the Middle Fork, and on the north and south branches of it. On the South Fork, at Alabama bar, Hazlett & Co. have a large force—all Chinese. At Rector's bar Kasloski & Co have a gang of Mongolians; Wilson, on Horseshoe, is running a crowd of the pests; Stuart, at Stumps bar, ditto. The Mitchell mine, on El Dorado canyon, is paying well. He has a large force of white men at work.

PLUMAS.

PAYING LIVELY.—Plumas *National*, June 24: The Loring & Leavitt claims at Elizabethtown, recently purchased by Corbin, Manson & Co., are paying at a rate that is astonishing. We give a few figures to show what is being done there, with only a few men at work—probably not more than four picks running at once. For the week ending on the 17th inst., they cleaned up about $1,600. From the 18th to the 21st, $1,200, and since that time they have been making big pay but we have no figures. For the week ending the 10th, they cleaned up $2,100, or a few dollars over that amount.

NELSON POINT.—In company with some friends we took a look through the Willow ranch country on Wednesday, and found things looking prosperous. Metcalf & Co., whose hydraulic claims are situated directly opposite Pauley's hotel, have had a big run of water this spring, and have improved the opportunity, too. They have piped off a large lot of gravel, and are now cleaning up, with good results. On Wednesday one of the workmen picked up a nugget weighing some $15, showing that the gold is coarse, and the evidences are plenty that they will make a splendid season's work. They have acres of good hydraulic ground in front of them—more than they can wash away in years to come. The Blue Gravel mine is still idle, but there is some reason to believe that active operations will commence there before the season is over. Nelson Point and vicinity is one of the old-time rich spots of earth.

A GRAND MINING COUNTY.—Plumas *National*, June 24: Every day shows our county in a better light as a mining country. Prospecting is going on lively in every direction, and the work is bowe more clearly, every day, that Plumas has undeveloped riches which will put her in the front before long, and make her noted all over the world as a mining center. A large scope of undeveloped mineral land lies to the south of Meadow Valley, and several locations have been made there, but, as yet, but little work has been done toward opening the immense body of gold-bearing gravel which the mountain contains. Spring Hill, owned by Bone & Phelps, is the only place where work has been done tending to show the wealth of the lead, and at this company's claims the showing, for the amount of work done, is very flattering, the gravel being beautiful and rich, and the small opening proving that it is extensive. The tunnel run by the company is some hundred ft into the mountain, and a raise from it of some 75 ft put it into gravel. The rim shows plainly at this point, and the upper drift followed it for a hundred ft more when it pitched back rapidly, and work was stopped. The gravel on this rim is rich. Lying to the east and north of Spring Hill are several locations which promise to be very valuable.

SAN BERNARDINO.

LAWSUIT.—San Bernardino *Index*, June 24: R. J. Whitton, the mining expert who has been in San Bernardino for several weeks past, has lately had assays made at different depths on the Lawshe mine, at Pinacarte. There are two 50 ft inclines, one drift 32 ft south, and another 130 ft north. A sample of 13 lbs. of ore was taken from each 10 ft of this distance, giving an average of $81.86 to the ton. A more complete test of the real richness of the mine could not have been made, and it is far above what the owners anticipated. There were shipped from here yesterday, per Wells, Fargo & Co.'s express, four bars, containing gold and silver. They were from the Gunsight mine, Resting springs, and were consigned to a firm in San Francisco. The total value of the four bars was about $7,000. The Pinacarte mill is shut down at present, awaiting some additional machinery. A short run was made last week of 5 tons, yielding $151 50.

SIERRA.

THE RAINBOW BONANZA.—Nevada *Transcript*, June 22: The Rainbow mine at Chips flat, Sierra county, made famous this spring by one of the richest deposits of gold ore being found therein that there is any record of in the history of California, continues to pay as well as during the early stages of the development. The remarkable chute is not as conveniently worked from the present shaft as could be wished, and a new one situated further to the north will shortly be put down. In the meantime a cage has been sent up to be used in the place of the bucket which has formerly done service in the old shaft. To Supt. J. O. Groves' intelligent management of the Rainbow is due much of that claim's phenomenal success.

TRINITY.

A WIDE CHANNEL.—Trinity *Journal*, June 24: From Mr. P. M. Paulsen, who visited the Oregon Gulch Mountain mine of the Trinity gold mining company this week, we learn that the mine is looking well and is now opened in splendid shape. Mr. Paulsen measured the channel on the bottom and found it to be 207 ft in width, with plenty of rich gravel. With anything like a favorable water season next year, this mine will give out a large yield.

NEW RIVER.—The derrick lately put up by Boles & Co. is doing good work; it easily raises and swings out of the way bowlders that weigh as much as three tons. This is a step in the right direction, and I wonder at people wasting so much labor breaking rocks when $100 invested in a derrick would save all that labor. The Portuguese company made a run of eight days through the cut they have been blasting last winter, and they cleared 13 ozs. from the ground sluice. This is from the gravel only, as they leave the bedrock till summer when water is too low to ground sluice. From a run of 20 days they took 27 ozs., or nearly one and one-half ozs. per day from another cut; this also without touching the bedrock. This is conceded to be doing well. Work is stopped on Slide Creek and Eagle Creek claims for want of water. Messrs. Sherwood and Mills are working away at the ledge at the head of Pony creek. Healy, the discoverer of another ledge on Eagle creek, is running a tunnel to strike his ledge 20 or 30 ft below the surface. Carson and Donald on North Fork are reported as doing well. On Virgin creek there are six or seven men working in the bed of the stream. The river is quite low and wingdams are now in order, with prospects of doing well.

NEVADA.

WASHOE DISTRICT.

MEXICAN.—Virginia *Enterprise*, June 26: On the 2500 level the joint Union Consolidated winze has been sunk and timbered 10 ft, and the joint Ophir east winze 11 ft. At the 2400 level of this winze a tank station is being cut out. On the 2700 level the east drill hole has been extended 105 ft.

CON. VIRGINIA.—On the 2300 level the joint Con. Virginia and Best and Belcher east drift has been advanced 14 ft. On the 2500 level we are cutting out a station for a winze joint with the California Co.

SIERRA NEVADA.—On the 2500 level the joint Sierra Nevada and Union Con. winze has been sunk and timbered 12 ft. During the week 310 tons of ore, assaying $22 per ton, have been extracted on the 2400 level.

CALIFORNIA.—During the week we have extracted and sent to the mills 69 tons and 600 pounds of ore, taken from the 2000 level. On the 2500 level we are cutting out a station for the joint California and Con. Virginia winze.

OPHIR.—On the 2500 level the joint California winze has been sunk and timbered 14 ft, and the joint Mexican east winze has been sunk and timbered 11 ft.

SIERRA—DEVIL'S GATE.—The machinery has recently been overhauled and is in good working order. Work has been resumed in the south drift, where we have a very promising vein from two to three ft wide, carrying streaks of rich ore, assaying all the way from $70 to $400 to the ton.

ALTA.—Since the last report we have sunk and timbered the shaft 27 ft; total depth, 2,004 ft. The bottom of the shaft is in a mass of barren quartz, which does not blast very well. No change in other respects.

UNION CON.—On the 2500 level the joint Mexican winze has been sunk and timbered 10 ft, and the joint Sierra Nevada winze 12 ft.

UTAH.—During the past week the incline has been sunk and timbered 17 ft. The north drift on the 400 level has been extended 45 ft.

UNION SHAFT.—Are cutting out the station at the 2700 level and easing timbers at the 1000, 2200, 2400 and 2500 levels.

SUTRO TUNNEL.—The small sub-drain, leading from the Combination connection to the intersection of the south lateral, has been extended 50 ft. The main tunnel drain boxes are being braced down to prevent the water running in the sub-drain from displacing them. The other shift (removed from the main tunnel), have commenced securing the ground between the Hale and Norcross and Julia connections. The south header is now 164 ft from the south line of the Yellow Jacket claim. The flow of water from the tunnel is equal to 4,476,400 gallons for 24 hours.

DUN GLEN DISTRICT.

HOISTING WORKS.—*Silver State*, June 22: Vance M. Nelson arrived from Dun Glen last evening, on his way to Spring city, to attend to his mining interests. He says hoisting works are to be erected on the Lang-Syne mine, and it is supposed that Dr. Loomis has gone to San Francisco to purchase the machinery.

EUREKA DISTRICT.

WALES CON.—Eureka *Sentinel*, June 22: From the Supt. we learn that the Wales Con Co. owns 11 claims. The total length of the mine, embracing the entire group of locations, is about 4,200 ft., situated between the Richmond and Albion end lines and the Silver Lick Con. Co.'s property. The improvements on the Wales Con. (erected since the fire six months ago, which reduced everything to ashes), include the shaft and engine house (over 50 ft long) and several outhouses. The new steam hoisting works, which have been running smoothly for some weeks past, include a double-acting and double-cylinder sinking-station engine, with double reels, and having a capacity to hoist 2,000 ft, perpendicular depth. During the last three years a great amount of work has been done on the property.

LEWIS DISTRICT.

THE CAMP.—Cor. Eureka *Sentinel*, June 25: Lewis, Lander county, is a mining town of about 800 or 900 inhabitants. There are two 10-stamp mills in operation at present, and one 40-stamp mill under construction, which will be finished and running by Aug. 1st. There are 4 or 5 saloons and 2 hotels. The principal mines in the district are the Star & Grove, Betty O'Neil and the Morgan, which employ some 200 men. The Morgan mine has recently been sold to a New York company for $20,000. Miners' wages are $4 per day; mill men get from $3 to $5 per day; common laborers, $3. There is considerable lot jumping going on. Lots sell from $200 to $1,500 each. Lumber is scarce, owing to the railroad not being able to haul it.

RAILROAD DISTRICT.

COPPER.—*Times-Review*, June 22: The sale made to Wilde & Co is being utilized, and the mine is producing about eight tons of copper bullion per day. This is the Blue Bell mine. The same firm of Wilde & Co. have also purchased the Bald Mountain Chief, and as soon as the tunnel is completed they will take out ore enough to keep the smelter steadily at work. Mr. Hatch has bought some fine galena prospects at Railroad district. The ore assays from $50 to $110 per ton, and carrying the required fluxing elements. The ores can be sold for two-thirds of their assay value at Eureka, and several of similarly reported mines are about to extract ores and sell them in the Eureka market. On the whole the camp has a fine outlook.

SAN JUAN DISTRICT.

WORK.—Reese River *Reveille*, June 20: A very considerable amount of work is quietly going on in this and surrounding mining districts. Tolyabe range of mountains, especially, is being looked after by the knowing ones—those who are familiar with the country. We learn that a very fine prospect has been encountered in the Tiger mine, located in San Juan canyon, somewhere about 40 miles up Reese river from Austin, and in the Tolyabe range. The character of the ore is said to be carbonate or galena. Those who have seen the mine speak enthusiastically of the prospect in sight. There is doubtless a good mineral belt in the region of the canyon referred to.

WALKER LAKE DISTRICT.

MOUNT GRANT.—Carson *Times*, June 21: Matters at Mount Grant, 7½ miles from Hawthorne, would seem to be in a flourishing condition. Those interested in that capital of Walker Lake district will be pleased to know that an 8-stamp quartz mill is on its way from San Francisco, and will soon be at work at Mount Grant. The mill will begin crushing $200 ore. They have plenty of wood and water near the mine, and expect to be able to work the rock for $5 per ton. It is almost certain that three or four good mines in that vicinity will be disposed of within a few weeks in San Francisco, so that work may soon be begun on an extensive scale. Mount Grant promises soon to be a lively mining camp. It is close to the line of the Carson and Colorad railroad; within a few hours' ride of Carson and Bodie; the climate is fine, and everything seems favorable for an extensive prosecution of mining enterprises there.

ARIZONA.

KLARA CAMP, SILVER DISTRICT.—Cor. *Arizona Journal*, June 23: The silent mine, in the contract drift of 100 ft from the 90-ft level of the vertical shaft, is showing excellently, and the work being pushed rapidly. The hoisting works are in successful operation.

THE Pacific mine is being investigated by the contract shaft of 150 ft, and the result is the augmenting of the sacked pile of high-grade carbonate ore on the dump. Geo. W. Taylor, a Nevada mining superintendent of enviable reputation, has arrived, and will take charge as superintendent of the workings of the Boston Co.'s property (late Hughes group, and $175,000 purchase).

THE Silver Glance tunnel is on the wall of their ledge, work progressing favorably in the shaft, and preparations under way for deep mining.

THE Klara mine continues in favorable ore-bearing, live quartz. The crosscut is now in 20 ft of solid ledge matter.

BISBEE DISTRICT.—Cor. *Arizona Journal*, June 24: From present appearances our camp is soon about to enjoy another success in the way of a bullion producer. We have made the inquiry in regard to what has made the change, and find that all the claims that work is being done on are looking exceedingly well. New and rich strikes are being made every day, and the future of the camp has never looked brighter than it does to-day. On the northern copper belt the Copper Queen is hard at work, unearthing the vast body of ore and turning it into bullion and shipping it away to be used to the advantage of man and his welfare. There are now working at this mine and furnace over 00 men. In the mine the west drift of the second level is showing up well, the ore being rich in red oxides. The south drift on the 3d level has reached a distance of 47 ft, all in ore. They have started another drift on the east on the same level; it is all in ore. The mine never looked better than it does to-day. They are now grading for a place to move their crusher nearer to the mine. They have worked this month, so far, 592 tons of ore, yielding 116 tons of bullion; on the 18th they made their largest run, having worked within 20 lbs of 40 tons of ore.

SINCE my last letter they have made a very important strike on the Neptune mine, showing that the assertion that there is but one mine in this camp is absurd. They are now working a cut 70 ft in length, showing a ledge of high-grade ore, assays averaging 40% copper. In this cut they have a 10-ft shaft, all in ore, and in no place is the ledge less than 7½ ft, and from that on up to 10 ft in width. The smelter and machinery are now on the road from San Francisco, having been shipped the early part of last week.

THE Keystone mine joins the Neptune on the south. There is now a shaft 38 ft in depth; the ledge from top down being copper ore, assaying an average of 22%.

THE Black Prince lies southwest of the Twilight. It has a 10-ft shaft, showing well. Work is being pushed along by the owners.

CHLORIDE KING.—*Pinal Drill*, June 25: The Chloride King is in Rogers district, Pinal county. It belongs to Messrs. Pickering & Benson, was located in July, 1880. The lowest sample assay taken from the 18-ft shaft was $346. Where that was taken the pay streak runs up to 18 inches in width.

THE EASTLAND M. Co.'s PROGRESS.—Mr. McGowan, under whose immediate charge the work on the Tilden mine is done, reports that they have struck a 10-inch streak of ore in the shaft at a depth of 140 ft that assays 700 ounces. It is black sulpburet ore containing native silver. This pay streak is in white porphyry encased in black syenite, and is the third strata passed in the shaft of that character of ore.

THE WINDSOR CON. Co.—Nearly all the tailings at the Windsor Co.'s mill, Pinal, have been worked, and produced over $10,000 in bullion. When the new roaster is in place, they will commence with a fresh supply of chemicals on $200 ore which they are bringing from their Mount View mine.

SOUTH PIONEER.—*Silver Belt*, June 18: The South Pioneer has stepped to the front in public estimation, and is prospectively regarded as without a peer in Arizona, except the King, which is conceded to be the "boss mine" of North America. The now famous Mack Morris, when no more developed than the South Pioneer is at present, is dwarfed by a comparison. Mack Morris, one of the most intelligent prospectors of the Pacific coast, an original locator and half owner of the South Pioneer, repeatedly expressed his regret to the writer that pressing necessity forced him to part with his interest. We rejoice that all difficulties with the Scotts' and South Pioneer Co. have been amicably settled.

COLORADO.

LOOKING UP.—Bowlder *News and Courier*, June 19: Mining matters are now looking up very materially; new claims are daily being located, and old abandoned ones, and those which for want of funds have been lying idle, are being worked once more. The Golden Age mine is again developing into a great producer, having uncovered in a crosscut what all parties agree to be a marvelous body of free gold. The work of one man for one month realized $1,500. Since writing the above, we learn that from one sack of this ore 29 ozs. of gold were extracted, or $580 from about 70 lbs. of ore. Capt. Coan and J. L. Haff are putting in new sluice boxes, and getting ready to operate their placer claim in South Bowlder canyon. In a few hours Mr. Haff says he panned $20 in gold dust from these diggings recently. The Van Vleet mill at Balarat will this week ship 5 tons of concentrates of Smuggler ore. C. Frantz, forsman of the last-named mine, says that a foot of rich ore has been uncovered in the lower workings. Mr. Gill, Pres. of the Buena, is at Jamestown, and says that that property will shortly be the scene of life and activity. A. J. McCorkle has sold to Boyd, Cheney & Co. an interest in the Newcomb mine, situated near Gold lake, above the John Jay.

IDAHO.

CUSTER.—*Idaho Herald*, June 18: The Custer mill is turning out more bullion than any other mill on the continent of its size. Owing to trouble from surface water operations in the Montana mine will be suspended for a short time.

BAY HORSE.—The smelter is running right along, reducing ore from the Hood and Sky Lark, owned by the company. Large quantities of fine bullion is being turned out. The Ram's Horn is working about 00 men, and the mine is looking better than ever before. Considerable ore is being extracted from the Silver Wing, and there is a large quantity in sight. A large force of men has been put to work on the Post Boy, from which mine a good road has just been completed to the smelter. A large force is also at work on the Beardsley, and ore is being shipped daily to the smelter for reduction.

BOISE COUNTY.—The large chimney known to exist in the Wolverine has been struck. Much richer ore than was expected has been found. The Elmira Co. will put on a large force in 2 weeks. The placer mining season is about over in the basin. The Sub Rosa, in Gambrinus district, is looking first-rate, also the Forest King.

FOREST KING.—Cor Yankee Fork *Herald*, June 18: This mine, in Gambrinus district, is showing up finely, and the owners are very much elated over their success. The rock is fairly speckled with gold. Mr. Lockwood is busy putting up his 1-stamp mill on the Golden Fleece mine, near Centerville. The ledge is a good one. His operations are watched anxiously by many miners, and if the new mill does as represented many more of them will be put up in Boise county. The Canyon creek mines are showing up better than ever, and a good deal of rich ore is being taken out. The richest strike ever made in Boise county was made a few days ago, at Banner, by Jim Irwin. The new discovery is situated about 30 ft north of the Panamint, owned by Irwin & Co. Some of the ore is so rich that it can be whittled with a knife, and it is said that the surface showing is the greatest ever found in Banner. The latest news is that Jim Monroe has also struck it big in the Silver Chief. The ledge is narrow, but is very rich, and the proprietors are very much excited. Plowman's mill has been running for some time at Shaw's mountain with very good results, I am told. Several mines are working and are looking first-rate. Very little placer mining is going on this season. K. P. Plowman has leased his claims on Bear Run to a Chinese company, who are doing very well.

MONTANA.

STRIKE IN THE MOULTON.—*Inter-Mountain*, June 22: In the face of the 200 ft south crosscut of the Moulton, a ledge was struck this morning. The face of the crosscut is 138 ft from the shaft. Mr. J. R. Clark has come down from the mine and reports the ore body 3 ft wide, the ft wall not having been encountered. The quartz, Mr. Clark says, it is not exceptionally high grade, though the outlook for a fine ledge is very promising.

THE MORNING STAR.—Sinking operations on the Morning Star are delayed on account of the non-arrival of the machinery recently ordered. In the meantime the ore product has considerably decreased.

THE Eureka mine, near Jefferson, has been recently sold to New York Capitalists, who intend at once to begin extensive operations on the property. The new company will probably purchase the Helena reduction works for the treatment of Eureka ore. The amount for which the mine sold is not stated.

BONSER.—Inter-Mountain *Freeman*, June 19: Last Friday, Messrs. Longmaid & Sherrard bonded to Albert and Karl Kleinschmidt and James Ryan, the Katie, Buster and Judith quartz lodes, mill sites and placer ground at Basin City, for the sum of $100,000. The several properties will be vigorously developed. The Kleinschmidt Bros are the largest merchants in Montana.

THE PARROT.—The engine of the Parrot Smelting Co., has left Dillon, and by the middle of July the works will be in operation. The company will obtain ore from the Parrot mine, which they are now sinking on with that view. They will also purchase custom ore. If the story about J. Horst having sold a mine at Red Mountain for $120,000 be true, that insures the mule tramway from here to Helena, being built by Red Mountain, as the trail by that route is but 45 miles long.

OREGON.

ITEMS.—The Wood River excitement seems to be flattening out. Cleaning up is still progressing at the Sterling mine with big results. Logg & McDonnell, of Jackass creek, are still engaged in cleaning up, and doing well. Carson & Co., of Waldo precinct, made an excellent run last season, all things considered. Several miners are now prospecting in the vicinity of Palmer creek, some of whom are setting sluices. The various Chinese companies in different parts of the county have about cleaned up, and are making their appearance in town. They are becoming fewer every year.

JOHN BOLT, the genial Applegate merchant, was in town Saturday, who informs us that Jack Layton is washing off dirt at his mines with a 32-inch pipe in a manner that is wonderful to see. Mr. Layton expects to make a good clean-up, despite his mishaps of the forepart of the year.

QUARTZ.—Messrs. Seybert, Anderson, Mullen & Springstead are interested in a quartz ledge on the Wagner creek hills that promises handsomely. It is well defined and the ore is of an excellent character. S. M. Robinson informs us that some excitement exists in that section in consequence of this discovery.

APPLEGATE.—Another clean-up was made at the Applegate Gravel Co.'s mines recently, which proved satisfactory. Dan Silva, an experienced miner, has leased these diggings and will run them on his own account hereafter, commencing work immediately. The Chinese connected with the enterprise were invited to go, and they went.

OUR Leland correspondent, under date of the 19th, says: The Josephine M. Co., of Portland, of which John Salmon is superintendent, is putting up one of Wm. Salmon's late improved quartz mills on Tom East creek, about 2 miles from the Esther quartz mill. The mill will be ready to run in about 3 weeks. The company will first test the ledge between Cayote and Grave creeks, known as the Hopkins, Ford & Buck ledge. Mr. Salmon is putting the mill in the building formerly used by Hopkins & Co. for their arastra, and will he run with water power. Wm. Ruble, on Coyote creek, has about finished cleaning up, with good results.

UTAH.

PARK CITY NOTES.—Salt Lake *Tribune*, June 23: The shaft of the Utah is being sunk with as much speed as possible. The new shaft at the Lady of the Lake is down over 60 ft, being worked by a whim. New hoisting works will follow. There is talk of Pinedo sinking a shaft on one of the claims north of the McHenry—probably the Wilson & Barrett. The McHenry remains shut down, to the disadvantage of every one. The mines are all looking well. At the Jones Bonanza a drift to cross the vein is being run on the 300 level. Kidneys of rich ore are found throughout the country rock, indicating what may be expected when the vein is cut. The carpenters, under the charge of J. D. McKenzie, are busy framing the timbers for the new hoisting works at the Ontario.

Village Improvement.

The idea of improving California villages and rural towns is taking deep root in the minds of the people and we expect tbe futnre will show most pleasing results. The pioneer improvement society of this coast at Bsrkelsy, Alameda county, celebrated the occasion of its annual meeting hy an open air picnic and literary exercises, which were a pleasnre to all who attended. The plan of the meeting was very simple and can hs commsnded to othsr organizations. Each msmher of the society arranged to picnic his own non-resident frisnds and eacb entertained a part of the invited guests of the society. Thns the gronnds were dotted with little picnic parties, each heneath its own oak tres, and the sounds of merriment showed tbat the meetings and rsfreshments were enjoyed. By this arrangemsnt of small groups the lahor of preparing the repast was distrihuted through the wbole msmhership of the society, and the effect was far hetter than if a large union tahle, as in old-styls picnics, had heen attsmpted. The coming together of ths townspeople and their friends did much to make the efforts at improvement more widely known and will aid the enterprise in the fnture.

Chief of the literary exercisss was the annnal report of Prssident G. D. Dornin, which included many points calculated to awaken villagers everywhere to nnited efforts to heautify their surroundinge. In this intereet we present some of the leading ideae and facts from Mr. Dornin's report.

There wae much to he done. The village had just been evolved from the raw conditione of a farming community; primitive ranch fencee here and there presented an unsightly tumhledown condition as obstructions in the highways; the etreets and nnenclosed lands were used as common pasturage for cattle to the detriment and destruction of the trees which enterprising property ownere might have planted. It wae essential that a ehowing should he made dnring the present season to give the work a proper impluse; there was a great deal of inertia or indifference to overcome; much misnnderstanding of the purposs of the promotere, and some covert opposition. But these have heen in a measure corrected and gradually overcome; the large proportion of land owned hy non-residents, and made a common hy lack of fences, has to a considerable extent heen brought under fence, defining the etreet linee, and giving an orderly appearance to the town. In every direction tbe eye rests upon new trees, neatly etaked, and presenting a diversification to the ecenery.

The first attention of the association wae given to the introduction and planting of shade trees; to this end, certain trees were recommended for certain streets, heet adapted for their growth, and were procured in quantities to enahle the association to furnish those who deeired them at low prices.

The universal hlue-gum, broken and twisted in many places hy vagrant cattle and lack of proper attention, has in many instancee been uprooted and given place to the graceful maple, linden, elm, ash or poplar. Nor is it the intention of the Association to be eatiefied with this limited range of varietiee. Acting upon the snggestions of our worthy Professor of Agriculture, and with the advantages of the proximity of the experimental farm of the Univereity, it is hoped that we may introduce along our avenues species of graceful trees yet comparatively unknown to our State; that our Berkeley hilleide may be representative of the flora of many portions of the world.

While mnch has heen done, we are yet in the infancy of our village improvement association. The work of tree planting which has heen already accomplished will make it easier to extend next season; the now vacant epaces will he filled, and along every avenne leading into our town will be presented parallel rows of graceful trees; our little park at Dwight way etation will eoon form a fitting introdnction to our pleasant village; the grading of Dwight way hy the enterprise of the neighhors under the inspiration of our association, will necessitate similar work in the adjoining streets. The man who was indifferent to the condition of his nnsightly fence will feel rehuked if hie is the only one among the many neatly repaired and painted or whitewashed fences on the street or, if he is indifferent, his wife and daughters will prove thorns in the flesh until the neceseary repairs are made. The unsightly keroeene can, or discarded hottle will be more obstructive, hecanse of the growing public opinion which condemne them as out of place on the street or on the adjoining lot.

There is a great deal to he done, and we most need individual action; the great work of this association is not to he done directly hy the association or its officers; it muet come from the spirit of improvement, acting in each individual memher of the community, man, woman and child. Nor should we wait nntil each of our neighhors is ready to act; two or three perεons (neighhors) can inaugurate the necessary improvements in their proximity, and hy a eteady pressure may in due time hring all into the plan; if the ohetinate or indifferent one be found, the good work ehould not etop, hut he apportioned among the more willing, liberally disposed, and public-epirited neighhore; the compensation will he had in the gratifying reults of our lahors.

A CONFLICT between the Russians and Chinese in Kashgar is said to he inevitahle.

Esmeralda District.

One of tbe best posted men on the mines of Esmsralda conuty, writes the following lstter to the Virginia *Enterprise*: "Now I am going to give some reminiscences of the past and present of Esmeralda connty in my simple way, making this lettsr a compendium of facts. Early in the spring of 1863, I hecame a citizen of Aurora. I was attracted to Nsvada hy the flattering acconnts given hy the pnblic press of the inexhanstihls hodies of rich gold and silver ore. Virginia city was in a fnll hlaze of excitement at the time, as was also Anstin and Aurora. I have watched the latter town in its snccess nntil $8,000,000 or $9,000,000 of the precious metals were poured into the stream of commercs within the space of three years. Aurora mnst become, some day, the attraction again.

"The old minss have nevsr hsen worked over 150 ft. perpendicular on an average, which is no mineral test, hut mere hen scratching. The monntains majestically rise one above the other like a series of steps—Hnmholdt, Martinez, Last Chance, Middle and Silver Hill—a large mineral helt passing througb tbe ridges for two miles, whicb is interspersed with hnndreds of ledges, pointing to the sonthwest and northeast and dipping to the south, imbedded witb granite and a species of mixed slate. The country does not seem to be hlistsred and hroken np hy volcanic or other internal physical causes, like some other parts of Nevada. What the camp wants ie a liheral distribution of capital in its numerous mines, with a judicioue and honest management. With a thorough exploration it will repay and redound to the honor of ite name. Aurora means the Goddess of Light or the rising light of the morn. The monntaine are rihhed with gold veins that have worked $1.50 to the ponnd. She mnst take her position among her eister mining towns again in a large output of rich ores. The place mnst hecome one of the financial levere of streugth to this State. It has all the natural surronndinge, with an ahundance of wood and water. Among the most noted mines of the past is the Del Monte. This mine was in 1863 a magnificent piece of property, disbnreing a heavy percentage of all the hullion yielded here.

"At preseut there is the Empire mine, owned hy rich capitalists; the Garihaldi mine, witb a government patent; the Crocket and Sam Patch lie adjoining these rich ore veins. Humboldt hill has among ite noted mines the Humholdt East and West. These mines are owned hy men of considerahle experience, and will, at some time in the fntnre, greatly add to the importance of Esmeralda mining district. Middle hill is fartber to tbe west of both of the last named mountains, and contains a great number of quartz veins—the Dnrand, Young Americn and Grand Trnnk, which noted ledge can he traced into Last Chance hill, where ite name is the Thanksgiving. Not far from this ie the Rothschild. All of these mines have large croppings and rich ores, with a prosperous fnture. Silver hill ie eituated at the westerly end of these mountains, and has among ite succossful ore-prodncing minee tbe St. Lonis, Antelope, Centennial, Poor, Cortez, Utah and a number of others that must eventually swell the bnllion yield, if eucceesfnlly developed to great depth. To the north of Anrora, 16 miles, is a mining district known as Elhow, which has flattering prospects of good gold and silver veins. This is not very far from the Sweetwater valley and ite beantifnl mountains; it and Smith's valley are surrounded hy mineral hills, which, I think, will be the scene of successful mining enterprises. The people of the two valleys are kind and conrteone."

Abandonment and Re-Locations.

In reply to a Montana inqnirer, the Commissioner of the General Land Office says: If John Doe ewears that a claim of which he wae at one time part owner, wae originally located in 1875, as yon state, and that during the years 1878 and 1879 no work was performed or improvemente made on the claim by the former locators or their grantees, and Richard Roe ewears in effect that no expenditures were made upon the original location eince September 20, 1878, the Depa tment does consider the evidence efficient to prove abandonment, Roe's affidavit is worthlese in that it doee not show that the required expenditnres were not made npon the claim hefore the 20th of September, 1878, to enable the owner to hold his location for that year, and if such expenditures were made at any time dnring that year, the claim would not have been snbject to re-location hefore Jannary 1st, 1880, for failnre to work the same to the neceseary entent, and in ench case a re-location in Decemher, 1879, mnst necessarily he void.

Under date of August 27, 1879, the Commissioner of the General Land Office held that where a re-location is had npon the ahandonment of a prior locator, the applicant is reqnired to furnish proof of snch fact hy affidavits of himself and other creditahle partiee who are pereonally acquainted with the facts, and that "euch affidavite should state the facts with all poesihle particnlarity, giving dates of occupation and ahandonment, with circnmstances attending the same." In accordance with this ruling the applicant muet supplement the evidence of John Doe with that of his own affidavit and that of one or more creditahle witnesses having knowledge of the faots constituting the alleged ahandonment.

The Pinal County Black Diamond Coal Fields.

Mr. Jake Schneider hrougbt in a big specimen of coal from the fields in Pinal county, situated ahout 40 miles from Pinal, southeasterly. The road runs hy the way of the Bowman mine to Riverside, and thence to Dser cresk. The coal fields extend from the Dripping springs west to the head of Deer creek, an extent of 10 to 12 miles in width. Thess fields are all located. Mr. Schneider's location is near the center, and is celled the Mountain Visw. The layer of coal is from five to sevsn feet in tbickness where the work is, and he has only gone down ahout ten ft. The claim is 160 acres, and it has been prospected in varions places, to ascsrtain the fact that this layer extends all over the claim, and fonr miles further np to the head of Deer creek. The layer of coal dips to the sonth and runs from east to west. Andsrson Lilley & Co. have made great dsvslopments, and have sunk several shafts. There is about 100 tons of coal on the Bonanza dump. The coal contains over 90% carhon, and very little sulphnr. These coal fields are all in Pinal connty, and are called the Black Diamond coal fields.

The country is rolling, and is sasily accessihle from Pinal and the Gila river. The conntry is wsll timhered with pine and csdar, sxsllent for all mining pnrposes and railroad ties, etc., the trees are generally from one to two feet in diameter, and 25 to 40 ft. high, and in many places the forest is so dense that it is hard to pase through it. The timher extends about eight milee square, and the coal fields are under and close to this forest. Tbere is plenty of running water. The coal fielde are ahout 12 miles sontheasterly from the Gila river, up Deer creek.

In near proximity to these coal fields are the silver mines on Saddle mountain, called the Hayes mine, the Goldcn Eagle, Mayhell, Blackspar and othere about eight miles northerly. On the Hayes there is a shaft of 80 ft., carhonate ore, the pay streak two and a half to four ft. wide, asays from $30 to $600. The Golden Eagle has a shaft of 75 ft. and 26 ft. crosscnt; ore, carhonate, carriee also gold, assaye $100 in gold and $80 in silver. Mayhell has a 60-ft. shaft, carhonate ore, assays average $100. The Blackspar has a 40-ft. shaft; two ft. pay streak average assay $100. There are 15 or 16 locations, all ehowing good ore on the top. The camp is lively and prosperous. At the month of San Pedro they are now erecting a five-etamp mill, for custom work.—*Pinal Drill.*

Chinese Placer Mining.

A gentleman who has been examining the methods of the Chinese who are engaged in placer mining on Gold canyon, helow Silver City, eays they excel white miners in saving fine gold under difficultios. In the gravel of gold canyon is an immense amount of hlack sand and great qnantities of iron stones and pehhles.

The eand and etones settle to the bottom of the slnices, and there hecome eo compact that the gold cannot reach the quicksilver, hut is carried away and lost. The Chinese have their slnicee so arranged that all the material passing throngh them falls into a large shallow tank, the hottom of whicb is floored with iron pierced with holes. From this is ehoveled or forked all the material that is too coaree to pass through the screen.

The material that falls through the screen with the water is carried out npon hroad slnicee covered with hlankets, and the process then employed is very similar to that nsed in ordinary hlanket slnicing.

By the nse of the screen in the etart they greatly reduce the hnlk of the material to he handled in after operations, and at once get rid of all coarse, heavy and tronblesome etones and gravel. The earth and light material of all kinds float away with the water, and gives no more tronhle, therefore little is left hehind on the blankets hnt the gold and black sand, and the qnicksilver and amalgam that have fonnd their way into the gravel along the hed of the stream.

In places where the ground is flat, and euffi-cient fall cannot he found to carry away the tailings from the end of the sluices, the plan adopted hy the Chinese saves a good deal of work. It ie mnch easier to ehovel the large rocks out of the hox than it would he to etand at the tail of the etring of slnices and there ehovel ont coarse, fine and all ae it comes down.

As the Chinese work, they have no trouble with the fine stuff. It rune away of itself when separated from the coarse and heavy material.—*Virginia Enterprise.*

SMELTER COMING AT WOOD RIVER.—We had the pleasure of meeting J. B. Parker last Wednesday. He is looking up the indncement which the Wood River galena helt offers to one who will ship in a first-class hydrocycle. Mr. Parker is just in from South Mountain, Owyhee county, where he has a 20-ton water-jacket furnace, and an engine of 24-horee power. It is all ready for use, and is qnite new; was constructed in Portland, Oregon; and if Mr. Parker can find an eligible location to ore, wood and water, it will prove a valnahle piece of property for this eection. The gentleman hae gone on a tonr of inspection np the river, and, no donht, will locate his site hefore he returns to Sonth Mountain.—*Wood River News.*

North Utah Mines.

For two years past, a number of plodding, patisnt minsrs residing in Ogden have, with an abiding faith in the mineral wealth of the conntry around them, dslved and dng, drilled and blasted in the mountains and canyons. Month aftsr montb bas passed with results far from satisfactory, financially speaking, nntil at last, indications warrant them in believing that thsy will ere long show dsvelopments at which the world will wonder. The *Pilot* man in spsaking of the outlook says that this too long neglectsd district is bsing prospected hy only a few men with sufficient ensrgy and perssvsrance to hring out a knowlsdge of the wealth stored away in these hills. At various places along the range from Wsher csnyon to a point some miles north of Brigham city, men are engaged in delving for minsral with various results. North of Ogden canyon ths country has heen hut little prospected until we reach Willard district, which now gives the richsst promise of any north of Salt Lake city.

Still fnrther north, the mineral belt is found, and at a point northwest of Brigham City, nnmsrous prospects have beeu located and some work done. The Keystone mine is prohably tbe best ons there at pressnt, and has had the most work done on it. It is located at a point ahout thrse milss from Brigham City. The first assay made on ore found at the surface gave gold, $90; silver, $23; and lead 45%. The vein at the surface was only six or eight inches, but in sinking the vein has opened out to ahout five ft., and the ore has changed so that a late assay gave gold, $44; eilver, $78. A shaft hae heen snnk hetween 40 and 50 ft., and ahont 40 tons of rich ore is piled on the dump. S. T. Joslyn, Paymaster of the Union Pacific, George Thatcher, Snpt. of the Utah and Northern, and several other railway men are the fortunate owners of this mine. A sample of the ore lying on our table is fine galena, with carbonates, and we are told that the quantity of carhonate ore increases as sinking is done. In the near fntnre we expect to see hundreds of good mines in the portion of the great Wasatch range lying north of Weher cauyon, in a distance of 30 miles.—*Southern Utah Times.*

Mining Swindles in New York.

New York is said to he cursed at present with some of the most hare-faced swindles that were ever attempted to be foisted upon the pnhlic. The Wall Street *News* saye some of theso so-called companies have not even a prospect, or a foot of mining ground, and yet they are issning stock, sending out elahorate proepectnses and telling the moet glaring falsehoods to sell their stock. There are fools who huy it, too, and after they have their eyee opened to the fact that they are ewindled, they will place all mining companies, whether good or had, in the eame category with the one hy which they were swindled, and all the men in creation oould not make them tonch another mining stock or invest a dollar in a mining enterprise. These ewindling mining concerns do more to injnre the mining industry than any other one thing, and the *News* thinks there ehould he some way devised of pntting a stop to the hnsiness.

There is no other industry that paye hetter than mining, if it is legitimately prosecuted, and it is the duty of every honorahle mining man to do all in his power to protect the indnetry from a class of men whose every action tends to disgrace it. There are papers in New York which make a speciality of mining, and pretend to give impartial newe from mining districte on the Pacific coast. It is evident, however, to their readers in this part of the country, that they are influenced hy coin considerations, and only condemn a mining ewindle when they are not paid for pnffing it, or, at least, not condemning and exposing it. It is the duty of every local paper which places the permanent prosperity of the mining indnetry of its vicinity ahove the temporary advantages which it derivee from the ephemeral success of a swindling company to expoee all euch and inform the pnhlic of their rascally operations.

Cheap Transportation.

Tbe Chicago *Mining Review* eays: "An overestimate on the valne of easy transportation can hardly he made in figuring on mining enterprises. An experienced man recently remarked in the presence of the writer that he wonld never again he caught off water or railroade in his mining ventures. The force of the assertion was felt when he pointed out the fact that many of the hest producing mines were utterly valueless, so far as the world'e market enters into the husiness, nntil railroads were hronght within easy distance. The first step in mining is to demonstrate the fact that railroad or water transportation ie at hand; and then may the mille and smeltere he pnshed to their utmost without feeling that the hullion product must go to pay the monntain road wear and tear on wagon tires and mule muscle."

To estahlish possessory right to a mineral claim reqnires, under the regulations of the General Land Office, a complete abstract of the claimant'e title hy the proper recording officere of the county or counties in which the claim is located, or a certificate from the same that no conveyances, other than tboee recited, are of record.

The Black Hills, Arizona.

A correspondsnt of the Arizona *Miner* has tbis to say of ths Black hills of Yavapai county: Stretching away west on ths eastern slope of the Verde river is an almost unbroken rango nf mnuntains, known at different points by differ-ent names, and presenting a variety of scenery unequaled by any others in northsrn Arizona. Jnst back nf the rich mineral belt that spans Lynx creek, Groom creek and the Hassayampa, they rise from low hills to minor mountains, and ars known as the Black hills of Yavapai county. Leaving Prescott and traveling about 20 milss cast you come to Coyoto Holes, whers yon camp, deriving its name from that harmless little auimal that Mark Twain describes as mak-ing night hideons with its philharmouic notes. Leaving there in the morning yon climb about 700 ft. and gst on top of the mesa. Here you are in paradise, for as far as the eye can see the giant pinss raiso thsir lofty hsads and gresn cedars spread their branches over the grass-cov-ered hills, making you think of Salt river and how you would liko to live thero if Yavapai was not in Arizona. Traveling in an east-erly direction yon come to tho break of the lofty mesa, from whose lofty top yon oan view the ranches on the upper Verde, dis-tant about eight miles, and feast your eyes on scenery enough to do any common man, but as the old saying is, "a man cannot live on scenery," you sinch your horse and com-mence to descend to the rich copper fields known as Verde district. Down you go for 1,500 or 1,600 ft., most of the way through fine min-ing timber. You arrive at last to look on cop-per enough to bottom the world. This is Head's camp, where is located the cslebrated Enreka mine, sold a short time ago for big money, and shows up as few mines ever did with the amount of developments. On the opposite side of the canyon are the locations of Messrs. McKin-non & Rufner, the principal one being the Wade Hampton, which shows up some very fine ore, and for miles can be ssen the same sign of per-manency of copper, so that it can he said of the hoys in this camp they are copper fastened. Leaviug the canyon from this group, you take the trail to Dorethy's location, known as the Emmet, which is nnder negotiation for purchase by a Philadelphia company. Passing this you take the old Indian trail from Prescott to the Verde, and in abont three miles find yourself at the New York camp, and again in copper, the principal location being the Hampton, owned hy Kennedy & Whittaker, of whose hospitality you will have to partake and stay all night. (Cortain down till morniug.) As you commence to ascend again to the mesa, they will show you the natural curiosity of Musical gulch, the theory of which is that old Mother Natnre got mad at some of her lower regions and blew them out, and only leaving a hole for some man like Mooney, of Grand Canyon fame, to bottom. Up, up you go and take a little *pasea* on Mingus mountain, named after the enteprising proprie-tor of the Mingus ranch, who has about 15 acres of potatoes planted at an elevation of abont 8,000 ft., raising a good crop every year without irrigation. From there you take tbe wagon road to a fine stock ranch two miles from Min-eral Point district, or Grapevine springs, where are some locations, but as yet smally developed, promising bonanzas as developments go on. When you arrive at the ranch, you will get some of the best beef in the county—made ten-der after you have lived on bacon and heans for a few days. He don't care how often you come; everybody knows him—Tom Saunders. After partaking of his hospitality and swapping yarns, you come back to Prescott with a good name for the copper fields of Black Hills.

U. S. J.

Journalism.—President Garfield, in bis ad-dress hefore the Ohio Editorial Association, at Cleveland, said: "It helongs to the honor of the press to have developed within the past few years as gallant a body of men, of as hright in-telligence as the world knows in any profession —men who have illustrated what beroism is by hringing from remote and dangerous quarters those items of intelligence that do so much to enlighten the world. Two forces are needed to improve, enlarge, and ennoble the sphere of jonrnalism. The first rests with us who are out-siders. If hy all the means in our power, we can make the people so intelligent that they will only patronize the best and worthiest journals within their reach, we shall have done our part. And if on your part you do so enlarge the sphere of your work, and increase its intel-ligence and justice and force, that ignorant and weak men will not want your jonrnal—and only the worthy and honorahle will deserve it—be-tween you and ns, the profession of journalism will go in no nohle inprovement, hettering that growth, and increasing the security of liherty in your country."

Ures District, Sonora.—Mr. Norton and Don Garcia will leave Tucson in a few days to commence work on their mines in the district of Ures. These mines are witbin 30 miles of Hermosillo; one and a half miles off the Sonora river, and not more than two miles from the main traveled road. These mines constitute a group, rich in precious minerals—chlorides, hlack sulphurets, and native silver—with all facilities for working within two miles of the property—formation porphyry and talc. The surveys of the Guaymas railroad, pass within eight miles of the mines.

Useful Information.

New Method of Inlaying Wood.

A new msthod of inlaying wood has been contrived by a furniture mannfacturing houss in England. Ths process is as follows: A vsneer nf the same wood as that whicb the design to be inlaid consists—say sycamore—is glned en-tirely over ths surface of any hard wood, such as Amsrican walnnt, and allowed to dry thor-oughly. The desigu is then cut out of a zinc plate about one-twentisth of an inch in thick-ness, and placed upon the venser. The whole is now subjectsd to ths action of steam, and made to travel bstween two powerful cast iron rollers of eight inches in diameter by two ft. long, two above and two below, which may he brought within any distance of each othsr by screws. Ths enormous pressure to which the zino plate is subjsctsd forces it completely into the veneer, and the venesr into the solid wood bsneath it, while ths zinc curls up out of the matrix it has formed and comes away easily. All that now rsmains to be done is to plane down the veneer left untouched by the zino nn-til a thin shaving is taken off the portion forced into the walnnt, when the surface being per-feotly smooth, the operation will be completed. It might be supposed that the result of tbis for-cible compression of the two woods would leave a ragged edge, but this is not the case, the joint being so singularly perfect as to be unap-preciable to the touch; indeed, the inlaid wood fits more accurately than by the process of fit-ting, matching, and filling up with glue, as is practiced in the ordinary mode of inlaying.

Vegetable Leather.—Tbe London *Mechan-ics' Magazine* states that there are very exten-sive works at Stepney Green, London, in which great quantities of artificial leather, are mann-factured. In appearance it resembles common leather, and it is only hy a very close scrntiny that the distinction between them can he detected. It is manufactured in wehs 50 yards in length, and four-and-a-half feet in breadth, and is now mnch used for bookbinding, and several other purposes for which tanned calf and sheepskin are employed by us. It is also used hy saddlers for making barness, and it may he made of any thickness desirable, and is capahle of being stretcbed or cemented. India rubbsr is the principal substance of its composition, but there are other ingredients mixed with it, wherehy its leather qualities are secured. The method of making it is not given, and it appears that this is kept secret; but that such a substance is man-ufactured, sold and used in large quantities is a fact of too great importance to be overlooked.

Sugar from Rags.—Brooklyn, N. Y., it seems, does not enjoy a monopoly in the manu-facture of sugar from rags, as recently described in their columns. We learn from a Enropean journal that this manufacture is now carried on upon a large scale in Germany. A German fac-tory is regularly ongaged in husiness, treating the rags first hy sulphuric acid so as to convert them into dextrine. The dextrine is bleached, hy means of milk of lime, and then submitted to a new sulphuric acid batb stronger than the first, after which, being transformed into crys-tals of glucose, it can be employed in jellies and confections. The glncose which is obtained hy this process can be sold very cheaply, and it resembles chemically that which is derived from grapes. Tbe attention of the German government has heen called to tbe danger, in a hygienio point of view, which may arise from the use of this article.

Preserving Wood.—The improved French method of preserving wood hy the application of lime is said to work well. Tbe plan is to pile the planks in a tank, and to put over all a layer of quick-lime, which is gradually slaked with water. Timher for mines require about a week to he thoronghly impregnated, and other wood more or less time according to the thick-ness. The material acquires remarkable con-sistence and hardness, it is stated, on he-ing subjected to this simple process, and the assertion is made that it will never rot. Beech-wood prepared in this way for hammers and other tools for iron works is found to acquire the hardness of oak, without parting with any of its well-known elasticity and toughuess, and it also lasts longer.—*Am. Manufacturer.*

Alum Water for Vermin.—Millers and others, who are tronhled with bugs and worms infesting crevices in the holting chests and other machinery, are recommended to try hot alum water, which is snggested hy high scien-tific authority, as a good method of destroying creeping things. Take two pounds of alum and place it in three quarts of warm water (or in that proportion), and let it stand on the stove until the alum disappears. Apply while hot witb a hrush to the crevices and other places that conceal the insects, or use it as the exigencies of the case demand.

To remove the ink from copying pads it is best to employ a soft sponge dipped into water as hot as the hand will hear. Hold the collo-graph inclined over the hasin, and wash without ruhbing. Chill the surface by applying cold water. A great numher of copies may he taken if the pad is dampened with a sponge dipped in cold water, when the print begins to get dim.—*Pharmacist.*

Working Under Water.—Mr. Flenss, of Portsmonth, England, has recently dsvised a new apparatus for snabling psrsons to work under the water and in the pressnce of noxious gases. Some practical applications of the mer-its of the device were recently given. He takes bslow with him a supply of concsntrated nxy-gen in a small reservoir which is slung nn his back like a knapsack. At svsry respiration from the tank, which is effectsd by means of a tnbe and month piece, the exhausted gas, after being strained through a sponge saturated with caustic soda, retnrns to the tank, the impure ingredisnts alone being permitted to escape. In this way he can remain nnder watsr for four hours, and can penetrate to sitnations whicb are impossible to an ordinary diver, who is com-pelled to drag a lsngthening pipe at svsry step, and is always liable to the dangsr of gstting en-tangled with the means which supply him with air. Whsn entsring an atmosphsre charged with smoke and poisonons gases, Mr. Fleuss divests himself of the diving dress, his only pro-tsction being tight-fitting coverings for his eyss and nostrils. Thns providsd, Mr. Flsuss has gone unharmed throngh fnmes of the dsnssst and most pungsnt description.

An Improved Mortar.—Some time since the use of sawdust in mortar was recommended as snperior even to hair for the prevention of crack-ing and subsequent peeling off of rough casing under the action of storms and frost. Someone by the name of Siehr says that bis own house, exposed to prolonged storms on the seacoast, bad pieces of mortar to be renewed each spring; and after trying, without effect, a number of snbstances to prevent it, he found sawdust per-fectly satisfactory. It was first thoronghly dried and sifted through an ordinary grain sieve, to remove the larger particles. The mor-tar was made by mixing one part of cement, two of lime, two of sawdust, and five of sharp sand, the sawdnst being first well mixed dry witb the cement and sand.

To Test Quality of Glue.—Dry glue steeped in cold water absorbs different quantities of water, according to the quality of the glne. From careful experiments with dry glue im-mersed for 24 hours in water, at 60° Fahr., and thereby transformed into a jelly, it was found that the finest ordinary glue, or that made from white hones, absorbs 12 times its weight of wa-ter in 24 hours; from dark hones, tbe glue ab-sorbs nine times its weight of water, while the ordinary glue, made from animal refuse, absorbs bnt three to five times its weight of water.

Imitation of Ground Glass.—The following recipe for imitation of ground glass is from an Antwerp *Scientific Journal:* Paint the glass with the following: Sandarach, 18 drachms; mastic, 4 drachms; ether, 24 onnces; henzine, 6 to 18 ounces. The more benzine, the coarser the grain of tbe immitation glass will be.

Good Health.

Healthfulness of Fruit.

Fresh, ripe, perfect, raw fruit is safe and healthful at all seasons of the year, and amid the ravagcs of disease, whether epidemic, en-demic or sporadic, general, special or local. Under proper restrictions as to quantity, such fruit as named will cure a diarrhœa, aid in re-moving a cold, colic, fever or any other disease wbose treatment requires the bowels to he kept freely open; for this effect, fresh, ripe fruit is acknowledged to have; hut to be used advan-tageously in health and disease, the following rules are imperative:

1. Fruit should be eaten ripe, raw, fresh and perfect.
2. It should be eaten in moderation.
3. It should he eaten not later than four o'clock in the afternoon.
4. No water or fluid of any description should be swallowed within an hour after eating fruit.
5. To have its full heneficial effect, nothing else should he eaten at the time the fruit is taken.

It is to the neglect of these observances that erroneous impressions prevail in many families, and to an extent, too, in some instances, that the most luscions peach, or apple, or bunch of grapes, is regarded as that much embodied cholera and death. When will men learn to he observant and reflective?—*Journal of Health.*

Injurious Effects of the Buttonball.—*Les Modes* states that a French medical journal has recently called attention to the injurious ef-fects that are apt to follow a residence near the common shade tree, the huttonball or plane tree. The fact has long been known, even from the time of Pliny, that a stay near these trees is often followed hy an irritation of the air pas-sages, followed hy a disagreeable and sometimes persistent cough. This is due to the fact (famil-iar to hotanists, though perhaps not to the gen-eral puhlic) that the young shoots, leaves and stipules are covered with a fine, thick down, composed of minute-branched rigid hairs, which falls off as these parts become older, and often floats in the air in large quantities. It is the inhalation of this that canses the throat diffi-culties. It often causes serious annoyance to employees in nurseries where the tree is raised, and who fail to take precaution against it.

Treatment of Sunstroke.—The peculiar atmosphsre of California admits of much more exposure to the rays of the summer sun than can be endnred in the Eastsrn States. But it is still well to know what to do in case of sun-stroks, as prompt action is gensrally necssary to avoid ssrious results. An exchange says: In case of snnstroke, loosen the patisnts clothss and baths the head and entirs body with cool water, and with moistened hands ruh ths extremities, ths neck, and the whols lsngth of the spins, rubbing in a downward direction to draw the blood from ths head. As soon as boiling water can bs obtained, put a dry blanket round the body, then ring flannsls from the hot water and apply thsm quickly to the region of the stom-ach, liver, bowels and spine, over the blanket; also, immerss the feet in hot water, or wrap thsm in hot flannels as far as the body. Re-wring the flannsls oncs svsry five or eight minntes for half an hour or more, then remove them and apply cold water in the same way, eithsr by cool towsls or sponging with cool water; dry well and rub the snrfacs lightly and briskly with the hand nntil a glow is produced. As soon as the patient can swallow, give him hot watsr to drink, and plsnty of it, with oc-casional bits of ice or sips of cold water. Often, of course, the attack is so slight that so thorough treatment is not necessary.

A medical discovery of great interest, if veri-fied, was recently announced by Dr. W. Cheatham in the Lonisville (Ky.) *Medical News.* This gentleman announces that he has made the discovery that the use of the sulphate of eresine makes it nnnecessary to use specta-cles in case their use is caused by a flattening of the cornea from old age—a very common com-plaint. He states that tbis drug possesses the property of acting especially on the ciliary mus-cle, and contracting it, which has the effect of increasing the convexity of the cornea. He reo-mmends dissolving one gram [grain?] of the sulphate of eresine in one ounce of water and putting one drop in each eye at hedtime. At first it is said to produce the opposite effect—great convexity of the cornea—or near-sighted-ness, hnt this is said to soon pass away. He affirms that, in his opinion, the remedy is per-fectly safe, and recommends its use in cases of inflammation of the eye from varions canses, for weakness of this organ, etc. Until it has been definitely ascertained that this remedy is not attended with unfavorahle secondary effscts, which can only he determined after its pro-longed use, we feel disposed to recommend cau-tion in its application. The observation, how-ever, is of the utmost interest.

Wool Sorters' Disease.—For some time past considerable discussion has arisen in tbe manu-facturing districts of England over a malady called wool sorter's disease. Mr. Roberts, the medical officer of health for the district of tbe Keighley Local Board, treats at considerable length in his annual report for 1880 of the nature and preventives of this disease. In snmming up from the report it is recommended that the fol-lowing precautions be taken without fail hy wool sorters: "(1) Wool sorters not to sort dan-gerous wools when they have any sore places or cracks on their hands or fingers; (2) to be oare-ful not to wipe or ruh their faces with their hands while sorting, especially if they have any cracks or pimples on the face or lips; (3) to wash their hands before eating, and to take neither food nor drink into the room where the wool is being sorted." The sorting room, he adds, ought to he well ventilated, to be swept regularly, and to have the walls and csilings whitewashed twice a year.

Protection Against Mosquitoes and Flies. A correspondent of *Nature* writes as follows: A young friend of mine, severely hitten hy mosquitoes, and unwilling to he seen so disfig-ured, sent for quassia chips and had hoiling water poured upon them. At night, after washing, she dipped her hands into the quassia water, and left it to dry on her face. This was a perfect protection, and continued to be so whenever applied. At the approach of winter, when flies and gnats get into houses and some-times bite venomously, a grandchild of mine, 18 months old, was thus attacked. I gave the nurse some of my weak solution of quassia to be left to dry on his face, and he was not hitten again. It is innocuous to children, and it may be a protection also against bed insects, which I have not had the opportunity of trying. When the solution of quassia is strong, it is well known to be an active fly poison, and is mixed with sugar to attract flies, but this is not strong enough to kill at once.

Buttermilk as Summer Food, Drink and Medicine.—A Detroit physician asserts that for a hot-weather drink nothing eqnals butter-milk. It is, he says, "hoth drink and food, and for the laborer is the hsst known. It sup-ports the system, and even in fever will cool the stomach admirahly. It is also a most val-uahle domestic remedy. It will *cure* dysentery as well and more quickly than any other remedy known. Dysentery is really a constipation, and is the opposite of diarrhœa. It is inflammation of the howels with congestion of the 'portal circulation'—the circulation of blood through the bowels and liver. It is a disease always prevalent in the summer and autmnn. From considerable observation I feel warranted in saying that huttermilk, drunk moderately, will cure every case of it—certainly when taken in the early stages."

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Saturday Morning, July 2, 1881.

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Passing Events.

Tbia week our sensation has been tbe nnexpected appearanca of a comet of very respectable dimensiona, and people were rather startled by being told there wera two or three of tbese celestial visitora in range, none of wbicb wera previously announced. It ia fonnd there is only one.

Here as elsewhere thoughts of 4th of July have filled tbe pnblic mind for a week past and display of bnnting, tbo imposing parade and the essentials of oratory, poetry and the one hundred and fiftb reading of the declaration, are all being planned and will he duly executed for the diversion and entertainment of the people. In this city there will he the nsual military demonstrations, festoons of flags will bridge the streets, and other decorations will not he wanting. Those who enjoy the excitement, tumult and spectacle of a city celebration will no donht he gratified by a visit to San Francisco next Monday. In the interior towns, and at the pleasure resorts where thousands are now congregated, there will be quieter obaervations of the day, and the patriotic spirit will rise as high as in the more imposing demonstrations.

THE average monthly bullion output of Arizona since January is over $650,000. The average will he much larger during the next seven months.

Two English ships with cargoes of railroad iron for the Oregon Railway and Navigation Co., arrived at Portland Saturday.

Ourselves.

To-day, the MINING AND SCIENTIFIC PRESS comes of age, commencing as it does tha 22d year of its existence. We begin the new term with energy and confidence, and assure our readers that we will do all that we can to further their intarasts by furnishing a good and readable paper in tha fntura as in the past.

Twenty-ona years is a long lifa for a newspaper to have lived anywere, but aspecially on this coast wbere such frequent and sndden changes in business occur. The same firm is pnblishing tha paper now as did so at the beginning, with the exception of tha first few montbs.

It is needless for us to inform our patrons that the PRESS has kept full pace with tha mining davelopments of the country, and that we taka a just pride in recording, year after year, fresh evidences of our success in our efforts to furnish our readers with a first-class industrial jonrnal for the progressive readers of tbis coast. Special evidences of our desire to keep fully up with the times have been given in our columns of lata. It has been our aim, and will be, to stimulate all honorable enterprises, to raise a warning voice against all wild and reckless speculations, to record passing events, to marshall in ordar all tha important discoveries and snggestions of the day wbence our readers can extract lessons of wisdom, whether in tha paths of Science or Indnstry. Our journal becomes in this way, with its faitbful record of all that is useful or instructiva, indispensahla to tbe miner, mechanic, or artisan, and a work of reference which will he sought for.

Situated in the center of the greatest mining field in the world, we devota a great share of our space to tha mining intarests of the country, giving the current news from all localities from week to week. We have paid close attention to all improvements of benefit to the industrial classes, and illustrated such new inventions as appeared to us worthy of special notice. Our efforts have naturally been devoted to the development of home industries, but in so doing we have ignored nothing abroad that would be useful at home.

We have kapt a complete and full record of Pacific coast inventions, giving weekly, as we shall continue to do, the list of patents issued in Washington, and describing in detail such as are of special interest to Pacific coast readers.

We propose to continua to improve the PRESS as occasion offers, and spare no pains in maintaining its excellenca. Our list of snbscribers has attained proportions which are very satisfactory, and our advertising patronage is of tha most respectable character, both as to styla and amount.

No person interested in mining pursuits can afford to be without the PRESS. It not only gives him tha current news, but describes all the new improvements and gives him the experiences of others in the same business. We collate from all available sources, practical information of far graater value than any subscription can he.

The MINING AND SCIENTIFIC PRESS has been in existenca long anongh to prove its worth, and to show that it fills its field properly, and we feel justified in assuring any new readers that they will without donht be satisfied in the investment of subscribing for a year. If our friends will continua to land their assistance as they have in the past, the paper will continue to improve even more rapidly than beretofore.

The State Mining Bureau.

The State Mining Bureau, which, as we have before stated, is compelled to change its quarters, as the building now occupied ia to be torn down, will he removed to 212 Sutter street. It was originally proposed to take the rooms in the front upper story of the Grand Opera house, but it was finally concluded that the location waa not central enough for convenienca.

The new quarters chosen, at 212 Sntter street, near Kearny, are quite centrally located. The first floor contains three rooms, covering an area of 30x56 ft., which will be used for general office, private office and library. On the floor above a large hall, 56x130 ft., nearly twice the size of its present room, will he devoted to the museum, being admirably adapted to the purpose by its abundant light, received through windows at either end and skylights overhead. A room in the rear will he used for laboratory purposes. Large accessions have been received and others are at the command of the museum, so that when it is finally opened to the pnblic some six weeks hence, it will be on a much more extensive scale than ever before. The building fronts south and has fine hay windows.

Mr. Hanks has had some considerable trouble in finding suitable quarters for the purposes of the museum, and at the same time getting a place where the rent was not too high. It will take some weeks to make the alterations in the building, and to place and rearrange the collection, but the operations of the Bureau will not be suspended in the meantime.

Mr. Hanks informs us that the income of the Bureau will probably he larger hereafter, as $5,000 will shortly he available, a much larger sum than was received from the collector last time. The collection of ores and minerals is rapidly growing, and the museum is fast becoming more attractive.

Oakland Harbor Improvements.

The greatest engineering work now being done on this coast by the Government is the improvement of Oakland harbor. We gave a short time since a report of progress on the work. The method of placing the rock, which we then described, is still being carried on. The training walls are fast assuming respectable proportions, and it will not now be very long hafore the whole tide flow of the harbor will he confined between the walls. The inner end of the north wall has been faced up, and both hargas are now being daily unloaded on the north wall. The rock seems exceptionally good in character, though, for the price at which the contract is taken, it is difficult to see where much money is to be made. Dredging is going on constantly, and, though the dredger seems to be in a chronic state of break-down, it does good work, when at work. At present the material is carried ont on barges and dumped in the bay. We hear, however, that arrangements are being made to deposit some of it on the adjacent shore. For this the contractor receives a higher price. The point where it is to he deposited will he on the C. P. R. R. Co.'s land, back of the freight slips.

The Government engineers have now in prospect another part of the work on this harbor improvement, which is an important one, and bids have been invited from contractors to do the work. The work to be done consists in the excavation of the flats of the tidal basin lying east of Fifteenth avenue, in Brooklyn, between low water line and the line of the marsh which forms the shore line, and in putting the excavated material *ashore*.

Here now is a chance for some enterprising persons. They can have 75 days, from the date of award of contract, to build a machine which will dredge and deliver the material ashore. Inventors of dredging appliances can here have an opportunity of proving the superiority of their devices. As most of the land near by belongs to the Oakland Water Front company, it is probable they will have no objection to having the material put asbore where it will improve their land. This remains to ha seen, however.

The part excavated is to be taken ont at least to one ft. below low water, and not deeper than 3 ft. below low water. It is supposed that the contractor can make arrangements for deposit with parties who wish to have land raised. The flats are shown by survey to extend to a height of 4 or 5 ft. above low water, sloping gently to the basin. Borings made show the material for the first 4 or 5 ft. in depth to be soft mud, which extends in places to much greater depth. In other places, the mud below is firmer, and has sand mixed with it. Bidders may choose their own place for excavation outside of the line of marsh, subject to approval and under the conditions that the area excavated shall he reasonably compact in shape and outline, having a width of not less than 500 ft., and provided it shall be made to connect with the existing low-water basin by a channel 200 ft. wide, having about 3 ft. in depth at low water.

This work, it is supposed, will ha followed by more of the same character, as appropriations become available. The amount to he applied under this contract will he what remains of funds now available after existing contracts shall be fulfilled. It will probably not ha less than $80,000, and may he as much as $100,000. No particular method of excavation is required in the specifications, and the intention is to give the contractor the fullest latitude in his operations, if this shall result in cheapening the cost of the work. The measurement of material will be in place as it now lies.

The deposit on shore will ha subject to such regulation in the way of herme or levee as shall, in the judgment of the engineers, be sufficient to prevent the material being returned to the basin. The place of deposit must, however, ha approved. The points of marsh land that make out from the two shores below Sixteenth avanna are not admissible as places of deposit. The rate of excavation required is not less than 30,000 cubic yards per month. It may he as much in excess as the contractor may choose to excavate.

Bonds to the extent of $30,000 will be required at the signing of the contract from two sureties, each qualifying in this amount.

The work will he supervised by an inspector, whose decision on any controverted points, when confirmed by the engineers, shall be final, and binding on all parties. Payments will be made monthly by checks on Assistant Treasurer United States to the amount of 90% of the work done, 10% being retained until the completion and acceptance of the work.

When this work is completed it will leave a large tidal basin at the upper end of the harbor, where many vessels can lie securely in the winter months. It is not safe for them to lie in the open bay, and Mission bay, once a favorite place, is now shut off by the bridge, the piling and the filling in. Coasters have, therefore, to go to Antioch or Oakland. The new basin will doubtless he a very useful one.

THE Salt Lake *Tribune* says that small steam yachts would do a thriving business on Great Salt Lake. At present there is nothing but sail boats to carry people to the islands and along the shores of the great inland sea.

Stored Electricity.

An exceedingly long step from the theoretical to the practical was made when that "box of electricity" was sent from France to England. Many years have tha scientific men of all countries been theorizing on the application of electricity to the purposes of every day life, aside from the important ones of telegraphing, lighting, etc. Above all things was it wanted for a motor, and now it seems, suddenly, this application is made. The box was sent to Glasgow, to Sir Wm. Thompson, having been stated to have been charged at Paris with a store of active electric energy to the amount of 1,000,000 foot-lbs. It consisted of four of Faure's batteries charged with electricity from an ordinary Grove's battery. The four batteries were enclosed in a wooden box, about a cubic foot in measurement, and weighed about 75 lbs. Sir Wm. Thomson now makes the important announcement that all that has been stated has been more than borne out by experiment. No appreciable loss could be ascertained to have occurred during the delay from transit and until the stored energy was applied to working purposes in Glasgow. One battery was detached from the other and carried to another place to supply the force for an electric cantery; and a single battery, after having been left alone for ten days, yielded to Sir Wm. Thomson 260,000 foot lbs., being some 10,000 above the original estimate. The first result Sir Wm. Thomson looks for is the use of Faure's batteries in private houses, as reservoirs of electricity for domestic purposes, such as lighting, heating, the driving of sewing machines, and many other objects.

We obtain electricity from the atmosphere by simple mechanical means, the principal expenditure being for power. Now, with a means of storing electricity, we store power; for it can be generated by wind, by running streams, etc., and saved for use when required. We thus chain up powers hitherto free from more than a passing restraint. The cost of storage does not seem to ha material in this application.

Of the hundreds of ways in which this power can he utilized, it is useless to speak. Already a tricycle weighing 400 lbs., has been propelled along the streets for an hour and a half continuously. This one practical experiment points out the way to thousands of applications.

Foundry Notes.

Pacific Iron Works.

These works have just shipped a 20-ton water jacket galena furnace for the Senate mining company, Galena, Wood River district. With it goes a complete equipment, consisting of engine, boiler, blower, etc. The plant is a very full one.

They are also building a large 40-ton furnace for a mine on the Upper Wood river, belonging to a Philadelphia company. With this are all the appliances for a sampling and separating works. The company proposa to put up separating works so as to take out the silver from base bullion and leave the lead on hand until better facilities offer for its shipment. The Richmond company of Nevada, which could not make suitable arrangements for freight, did this, and have now on hand, we are told, some 10,000 or 12,000 tons of lead.

Smelting works, consisting of a 20-ton furnace, have been made for the Sonora Antimony company, at Berkeley. They have also just finished a 30-ton copper furnace and plant for the Huachuca mining company, Silver Bell district, Arizona. They are putting up a new furnace plant for the Hacienda de la Constantia, near Alamos, Mexico. This is a 30-ton furnace.

They have built another copper furnace for the now famous Copper Queen mine, at Bisbee, Arizona, thus doubling the reducing capacity of the plant. They turned out 1,200 tons of bullion in six months with one of these 30-ton furnaces. The ore will produce an average of seven tons of bullion a day. The remarkable success of this company is largely due to the character of the ore, as it runs out of the furnace very pure, scarcely needing to be refined.

The Pacific works have sent three or four sets of hoists off to Montana, lately, and are just shipping a ten-stamp mill to the Silver Bow in that Territory. They shipped recently a chloridizing furnace and drier to the Almada and Tirite M. Co., in Sonora, Mexico. What is more notable is that amalgamating machinery has been sent to a mill in Colorado, a place from which we have hitherto had few orders.

Goss & Adams.

We examined this week, at the iron works of Goss & Adams, a pair of double-action plunger pumps of 150-horse power, and will deliver 8,000 gallons a minute at an elevation of 100 ft. They will be employed to raise salt water for surface condensers at the new California Sugar Refinery on the Potrero. The pumps are among the largest ever built on the coast. They were built under the patent granted to Mr. Dow, of this city, and he personally superintended their construction. The main peculiarity of the pumps is in the valve motion. We shall shortly give a detailed description of these pumps.

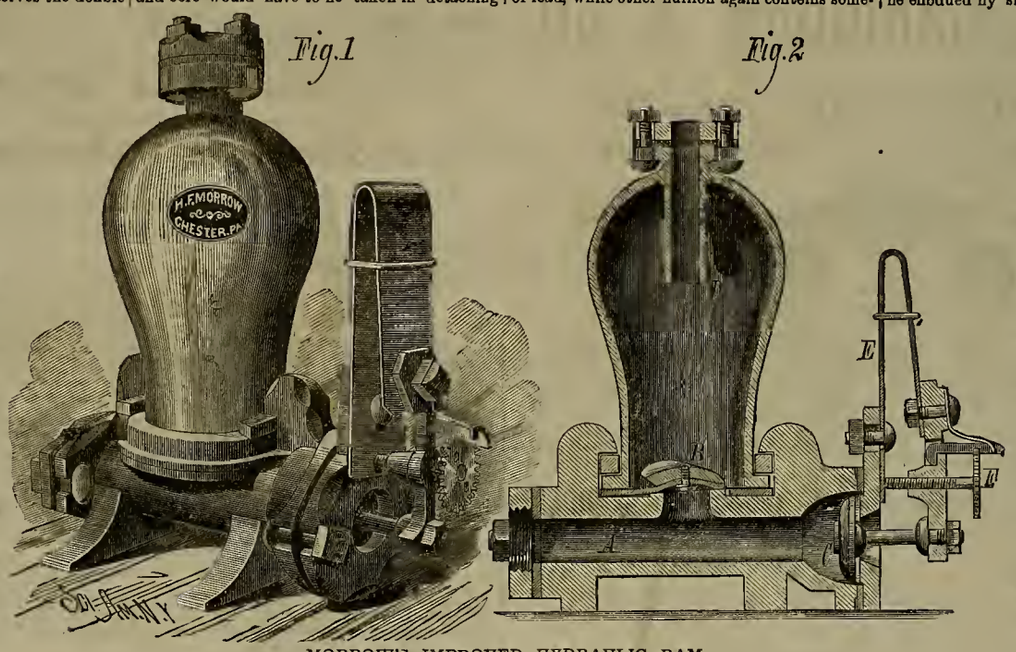
An Improved Hydraulic Ram.

A nnmber of onr readers have nssd hydranlic rams with full satisfaction in lcetions where water is abundant and snfficient fall conld he obtainsd to operate the ram. Wherevsr ths conditions are favorable there is nothing which can compare with a ram for water raising, bscanse if the dsvice be a good one it works on nnceasingly, reqniring a modicum of attention, thnmping and spirting in solitudo for months nr years sometimes. Snch hsing the value of the ram, we are wont to give attention to improvemsnts in the method of applying the principles which enter into its operation. The latest which comss to onr notice is that of H. F. Morrow, of Chester, Pa., which is shown npon this page. He has invented a ram which seems to embody every essantial fsatnre without being nndnly complicated, and is represented by the annexed engraving, in which Fig. 1 is a perceptive view showing the sxterior, and Fig. 2 is a vertical section showing the interior constrnction.

The base nf the ram has a horizontal passage, *A*, with a discharge valve, *B*, at the top, and an nvsrflow valve, *C*, at ths end. Covering the discharge valve there is an air chamber, held in place hy keye or wedgee, and farnished with a discharge pipe at the top, which projects a short distance downward and eerves the donble pnrpose of a diecharge for water and an escape for the surplns of air in the chamber. One of the greatest tronbles with all rame, aside from this nne, is the gradual increase of water in the air chamber nntil the chember is filled and the ram stops. The ram shown in the engreving airs itself, and drives off with the weter any snrplus air when the qnantity is more than sufficient to fill the epece ahove the lower end of the tuhe, *D*.

The discherge valve, *B*, ie attsched to a flep formed on a disk of leether which also forme the pecking nf the lower end of the eir ohamber. The valve is concaved to receive the head of the rivet nr holt which secures it to the leather; and the leether tonches the valve seet a short distence from the edge of the velve npening. By meene of this construction the valve is alwaye kept free from ridges, and whether or not it alwaye strikes exactly in the same place it is alwaye tight.

The overflow valve, *C*, is hung npon a cesting attached to the lower end of the spring, *E*, and its etroke ie regulated hy the screw, *F*, which beere against the hody of the ram. The screw, *F*, carries a toothed head which may he secured in any desired pceition hy a etop or pawl. This cohetruction admits of regulating the overflow valve to the 1-448th part of an inch, and effectually prevents it from jarring out of edjnstment. The valve can he regulated to meke from 30 to 300 strokes per minnte, and the ram may he adjusted so delicately ae to raise water 10 ft. on a 9-inch fall, or it may raise water 200 ft. with less than 4-ft. fall. For irrigating lands, snpplying dairies, farms, harnyards, dwellings, factories, engines, railrond etations, villages, etc., this ram seems invaluahle, as its extreme simplicity enahlee it to he set up or repaired by any one likely to nse it.



MORROW'S IMPROVED HYDRAULIC RAM.

Eureka District.—This district is now the most prosperons in Nevada. The *Sentinel* saye: Our camp is husy and hustling, and the fntnre appears brighter than ever it did before. Our minee are as yet nnly prospected; three that are worked are yielding well, and our merchants and bnsiness men are reaping the rewards of their investments and enterprise; hut few honses are marked with the ominons sign "To Let;" onr mechanics are all bnsy, and hut few idlere are found except those who would rather walk away from work than accept it when offered, or look with any energy to find it; nur hotele are well filled and restanrants well patronized, while those criterions of the prospsrity of a mining camp, the saloons and gaming tahles, are only too well patronizsd.

In the recent tendere for the constrnction of an iron hridge over the Douro, at Oporto, all the leading French firms were beaten hy the Societe Anonyme des Atsliers de Willebroeck, Belgium. The snccess nf the Inter was entirely dne to its excellent plans, which were classed first in the order nf merit, and also no douht to ite past reputation; for while its tender amounted to 2,066,000f., those nf its competitore were: Fives-Lille, 1,229,000f.; Cail et Cie, 1,539,050f.; Creusot, 1,703,000f.; and G. Eiffel, Levallois-Perret, 1,774,000f.

From last month'e operations on the Morning Star, Butte, Montana, Mr. Faraday realized a profit of $1,000 for each man employed, limited as are the present developments on that property, He employs 20 men.

The Electric Light for Mines.

We have previously given the details of the Swan electric light in nse in Europe, hnt Mr. Swan has now arranged it so as to adapt it to nndsrgrnnnd mining pnrposes. He hns exhibitsd it in the nsw form to the North of England Institnte nf Mining and Mechnnicel Engineers. Mr. Swnn said that on the principle of incan. dsscsnce yon conld divide the electric light indefinitely. He did not et first think of applying slectricity to the safety lamp. When he hegan to prodnce an economic electric light, his intention was simply to prodnce an electric lamp which wonld he gensrally applicebls; but several persons, whose opinions he conld not bnt respect, repressnted to him that the lamp in a suitahle form might be used for lighting coal mines; end these strongly expressed opinions hed led him to put the lnmp in the sheps in which it would hnve to hs for this purpose; and the ultimate result was the form of lemp which he exhihited. Improvemsnts in deteil might easily hs suggested; all he nskad now was to consider the principle of the lemp, and whether in any case it would bs applicable to the wants of coal-miners. It would be quite safe in n dengerous atmosphere, on condition thnt the glass did not hreek; another source of dnnger was the accidental rupture of the wires, and cere would have to he taken in detaching the wires. One of the main qnestions would be how far, snppoeing the lamp to give a good light, and to he comparatively safe, it wonld be feesihle to work it with the ordinary practicel operations? He was having 50 lamps made, and they would he placed in the hande of the memhers of the Acoidente in Mines Commission, and tried at a colliery in Nottinghamehire and elsewhere for lighting pit heaps; hut as a safety lamp they would he tssted in a lahoratory hy Prof. Ahel and his assistants. A nnmher of questions were asked and answered, and Mr. Swan said he thought they arrived at the conclusion, or almost at it, that it was too mnch to hope that the apparatus to generate the cnrrent could he so far reduced in size, weight, and cost, as to render the electric lamp self-contained and ahsolutely portahle. He added that there was no limit to the distance to which the electric current could he carried without serious loss, even as much as 20 or 30 miles hsiog feasihle. The President, in moving a vote of thanke to Mr. Swan, said that, seeing what changes had taken place in electric lighting, he did not entirely lose hope that we would have a self-contained and portnhle electric light.

It is not known that there are dividend mines in Georgia. The Con. G. M. Co., of Georgia, has just declared its eecond dividend of four ceuts per share, aggregating $4,000, payahle at New York immediately. Few California mines would dare offer so small a dividend as four oents per share, hut many are hold enough to go on for yeare without paying anything, hecanse they cannot pay hig dividends, and others even go eo far as to make liheral and frequent drafts on stockholders for development purposes, which often meane simply excavations in ssarch of supposed ore deposits.

According to the output of bullion from the various mining camps of the Territory dnring the last five mouths, the Arizona *Miner* is prepared to state that ehould the yield continue equally good for the next seven months, then Arizona can he marked as having given to the world 10,000,000 of money during the year. With the advent of certain railroads in 1882, then Arizona cen produce easily 20,000,000.

Roasting Ores Containing Lead.

It has not been nnly once that the mistake has been made on this coast of attempting to amalgamste ores that nught to have heen smelted, and attempting to smelt ores thet ought to have been amelgametsd. Furneces have been put up whsre mills were needed, and mills whsre furnaces were required. But the more frequent mistake has besn mede of roesting ores which had too mnch lead to admit of roesting. Leed hns a had influence in amalgemation, lixiviation, and in the roasting itself, ceusing a baking of ths nre at the slightest undus rising of ths temperatnre. Ths chlorids of lead amelgamates eesily, sspecially in iron pans. Mr. Kustel, in his "Roasting of Gold end Silver Ores," mniutains thet ores with 8% to 15% of lead will nllow of a successful roasting. A pert of the formed chloride of lead sscapss in gnseous form, another part is redncsd by degrees to oxychloride of leed. This latter comhiuation goss mostly iuto the amalgam. If there is more lend in ths ore than 15%, it gives sometimes, according to its naturo, as much as 85% of silver, and the retorted amalgem is suhmitted to cupellation in ordsr to separts the lead. If the lead is trensformed into a snlphate, it does not amelgamnte. This explaine the reason why some bullion of plumhiferoue eilver ores is free of lead, while other hullion again conteins sometimes 600 parts of lead in a thousand, according to the condition of the lead in the roasted ore. As yet no investigetiou has been made how to direct the roasting in order to convert all lead into a snlphate. Carbonate of leed as well as galena, form, under certain circumstances, snlphate, and very little of chloride of lead; sometimes it is the reverse.

Mr. Knstel gives an instance, where, in Hnngary (Offenbanya), black copper, contnining, hesides the silver, 10% of lead, was subjected to a chloridizing roasting. The pulverized copper ie mixed with 12% of salt, 1% of green vitriol, and 3% of saltpeter. The saltpeter oxidizee the lead to a enlphate, which in the eubsequent harrel amalgmnation does not enter the amalgam. Here snltpeter ie added for the purpose of oxidizing the lead to a sulphate in presence of salt. It is possihle that an addition of 50 or 60 lbs. of peroxide of manganese to a ton of roasting ore may have a great influence in thie reepect; and the conetruction of the furnace is not immaterial.

The Miners' Union at Butte, Montana, paraded on the third anniversary of its organization and had a hall in the evening. The object of the association ie not only to protect the wages of underground miners, hut to aid and assist all its members who may he incapacitnted for lahor hy reason of accident or sicknese. The wages of underground miners at the present time is $3.50 per day. While all workingmen are accepted as memhers, the wages of none are protected save those named, hut in case that any member is prevented from lahoring through an accident or hy reason of sickness, he is entitled to and will receive the sum of $8 per week. In case of great hodily injury he will receive more. At the present time the Union numhers 810 memhers.

Two Austrian iron worke have ohtained the contracts for the delivery of 19,000 tons of Bessemer steel rails and 2,000 tons of permanent way fittings required for the Servian railways. The period for delivery extends to the year 1883. A further contract of 7,000 tons of rails muet also he placed shortly, and this will probahly he ohtained on hehalf of the Austrian metal industry.

The Advantage of Perseverance.

As we have jnst passed the centsnary of the eminsnt engineer, Georgs Stephenson—June 9, 1781—it is not out of place to remind struggling young mechenics or enginssrs that this greet men did not achieve his distinction and fame without hard work, and that it wns not his gsnius alone that saved him and made him whet he was, bnt more his perseverance, ensrgy and determinatinn to snccesd. It will not do for a yonng man, becauss he supposss he hes gsnins or his friends suppose he hns, to sit down and weit for opportunity to come to him. He must mnnfully sail forward and put aside the obstacles which impede his peth, must persevere in his endssvors to perfect his knowledge and skill, nnd mnke the opportunities to use thsm. Samuel Smiles, who has writtsn a life of George Stephenson, snys of him thet for ths first 50 years of his life, he had sverything against him. He owed nothing to luck, to patronage, to ths adventeges nf edncetion. He owsd everything to bravery, intsnse conviction, and prolonged perssverance. He had to tsech himsslf sverything from the A B C to the principles of mechsnice. He hed to conquer every inch of the ground on which he stood. His conquests were not eesy, fnr arreyed against him were, first, his own ignorance which had to he enbdued hy silent, persistent endseevor; and second, the npposition of men nf knowledge and science, who etood united to oppose him and conld only be silenced by snccees. At first, Stsphenson etood almost alone in his helief in the powers of the locomotive engine. His experiments were carried on in silence end obscurity. They were qnite unknown to the journelists, historiens, and writere nf the day. The greet wnrk was done without any help from authore and orators. He never contented himself with dwelling in the regions of epeculation and abstraction. He worked energeticelly in giving life to a dormant principle, and practical reelization to en abstract proposition. Yet the facte which he developed hy experience were leughed at as "mooushine."

There is something tragic in witnessing the determined hostility which obstructed his efforts. Tho whole prejudice of the scientific world opposed him. When he invented the safety lamp he wns "pooh-poohed," and regarded as an interloper. The civil engineers opposed him to a man. He was not "nne of us," he had never received an engineer's education. They would not admit his fects. They would not even inqnire into his experiments. Everything that he proposed to dn wes demonstreted to he *impossible*. The civil engineere declered that it was impossihle to drive a locomotive at the rate of 12 miles an hour. The engine would he driven back hy the wind. If it traveled it wonld he beaten by the cenal hcats. But it conld never go at all. The smooth wheels could never "bite" npon emnoth rails. The wheels would merely turn round and round, and the whole machine would stand still. It was also declared to he *impossible* to make a railroad over Chat Moss without etopping short of the hottom. "No engineer *in his senses*," esid a distinguished civil enginssr, "would go throngh Chat Moss if he wanted to make a railroad from Liverpool to Manchester." The whole thing was declared to he "impossible." And yet the impossible things were done. What George Stephenson proposed to do, he did. The impossihle locomocive wns run, not only at 12 hut at 50 miles an hour; and the impossihle railroad was made from Liverpool to Manchester over the center nf Chat Moss.

Altogether the life of this distinguished man affords an example of what one may do hy persistent efforts, and unsuhdued energy. The moral teaching nf such a life is great, and the young men nf the day will find that as far as the means of personal progress are concerned, the means have not changed since George Stephenson's time.

Mining Watchman Murdered. — About three o'clock Saturday morning, Eyra Deljarmo was murdered in the Grass Valley Hydranlic mining clnim, near Volcano. He was employed as watchmnn on the claim, heing armed with a double-harrelled shot-gnn. His hody was found lying on the sluice hoxes, penetrated hy two rifle or pistol halls, one of which passed through the heart. Both harrels of hie gun were discharged. The robhere cleaned up some 60 ft. of the hoxes, hut how mnch amalgam they ohtained is nnknown.

Last week the famous Lexington mine, at Butte, Montana, was sold to Medhurst, representing a French company, for $1,000,000 cash. The property is considered well worth the money.

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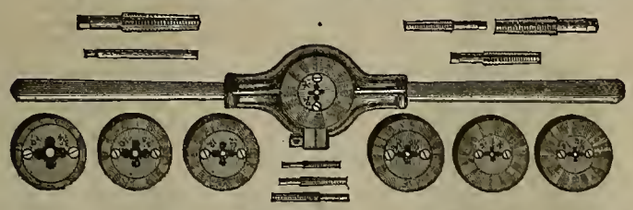

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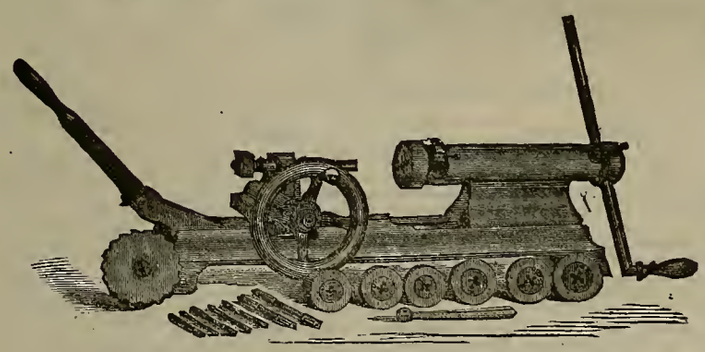
C, " 26 " " 7 " " " " ⅜ to 1 "
D, " 53 " " 6 " " " " ⅞ to 1½ "

No. 0. Lightning Hand Bolt Cutters and Tappers.



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Made to be bolted to the Bench or Table. Fitted with seven sizes, from ¼ to ⅜ inch. Usual assortment, ¼, 5-16, ⅜, 7-16, ½, ⅝, ¾ inch.

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FROM 1-4 TO 10,000 lbs. WEIGHT.

True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
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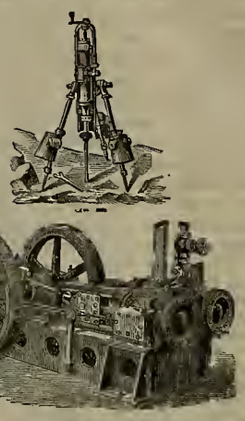
PRICES REDUCED.



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MANUFACTURERS OF
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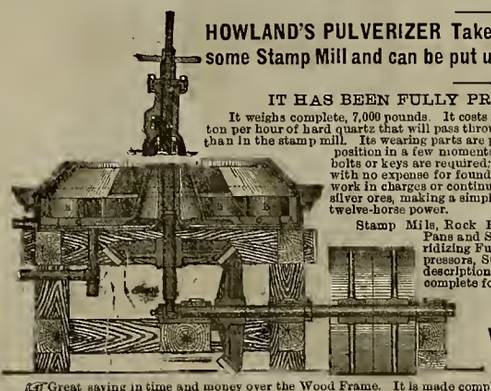

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IT HAS BEEN FULLY PROVED AND TESTED.

It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.

Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies. Iron Work complete for Wood Frames, also

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WROUGHT IRON FRAME
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☞ Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores, Wet or Dry Crushing Mortars.

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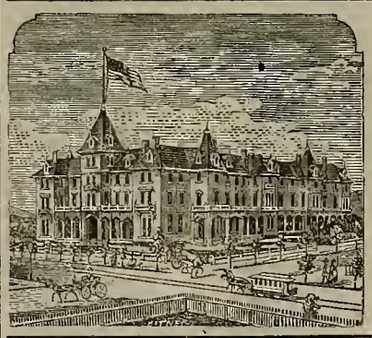

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Excelsior Blasting Powder,
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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
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THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand
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Saves from 50 to 100 per cent. more than any other Concentrator in use, and the concentrations are clean from the first working.
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I have on hand and for sale, at LOW PRICES, a number of the above Concentrators, of the latest pattern and in perfect order.
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This Company has the best facilities on the Coast for working
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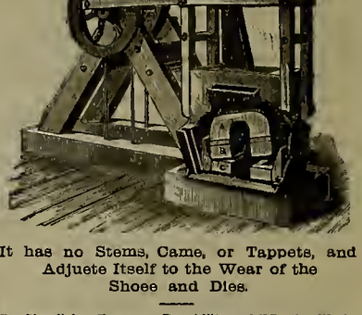

It has no Stems, Cams, or Tappets, and Adjuste Itself to the Wear of the Shoes and Dies.
For Simplicity, Economy, Durability and Effective Working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power.
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A machine for feeding quicksilver to the mortars of GOLD MILLS. It is so connected to the cam shaft, that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a mechanical movement, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding ordinary hand-feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect. Price complete, $100.00. Send for circular.
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MINING ENGINEER AND METALLURGIST.
Concentration of Ores (of all kinds), including the Chlorination Process for Gold-bearing Sulphurets, Arseniurets, and Gold and Silver Ores generally, with 120 Lithographic Diagrams. 1867.
This work is unequaled by any other published, embracing the subjects treated. Its authority is highly esteemed and regarded by its readers; containing, as it does, much essential information to the Miner, Millman, Metallurgist, and other professional workers in ores and minerals, which cannot be found elsewhere in print. It also abounds throughout with facts and instructions rendered valuable by being clearly rendered together and in simple order. It contains 120 diagrams, illustrating machinery etc., which alone are of the greatest value. PRICE, $7.50
ROASTING OF GOLD AND SILVER ORES (Second Edition) and the Extraction of their Respective Metals without Quicksilver. 1880.
This rare book on the treatment of gold and silver ores without quicksilver, is liberally illustrated and crammed full of facts. It gives short and concise descriptions of various processes and apparatus employed in this country and in Europe, and explains the why and wherefore.
It contains 155 pages, embracing illustrations of furnaces, implements and working apparatus.
It is a work of great merit, by an author whose reputation is unsurpassed in his specialty.
Price, $3.00 coin, postage free.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.

FOR THE WEEK ENDING JUNE 21ST, 1881.

243,053.—TALLY BOARD—H. J. Baddeley, Napa, Cal.
243,202.—OIL STOVE—B. C. Brown, S. F.
243,136.—DRY PLATE HOLDER FOR PHOTOGRAPHIC CAMERAS—J. M. Howe, S. F.
243,071.—POCKET KNIFE—A. Keyser, S. F.
243,160.—FANNING MILL—Thos. R. Rosier, Dayton, W. T.
243,161.—LATCH—J. W. Ross, Santa Clara, Cal.
243,321.—HARROW—Geo. S. Spring, Willows, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign, Patent Agency, the following are worthy of special mention:

SOFA BED.—Frank Laeremans, 525 Washington street, San Francisco. Dated June 14, 1881. No. 242,941. The patent which covers this invention, though modest in title, really covers several in one. It relates to that class of furniture which combines the sofa with the bed, wherein the back of the piece of furniture folds forward on the arms. It consists in a pair of grooved arms and a shifting back, provided with studs entering said grooves, and upon which the back swings in combination with projecting rails secured to the ends of the back, and which sustain the back when it is in a horizontal position to act as a bed. When used as a sofa, it looks like one—and is one; when used as a bed, it is a good wide one on a firm foundation. The user does not lie on the upholstering, but on the ticking, and this is made with slates like a regular mattress. With it is a movable frame for mosquito bars. Another combination of this principle is the sofa and operating table for the use of physicians. In one position, it is an office sofa; in the other, an operating table, with all necessary appliances, and so made as to take the patient in any position. Many of these have been sold, and for country physicians they are excellent. The combination is also formed as a chair and a crib. During the day-time it is a good easy-chair for bed-room use. At night a single motion makes it a crib, the side unfolding and being properly held in position. The most peculiar arrangement, however, is the sofa and table in combination. The back of the sofa, when tipped over horizontally, makes a table capable of extension. Its edges project over sufficiently to allow room for the limbs under the table. The end-leaves draw out and admit of inserting any number of leaves. This is a very useful arrangement for residences, steamers, etc., being very convenient. The frame can be made in black walnut, but a cheaper form is, of course, in pine. For sitting-rooms in the country this is handy, the table being out of the way when not in use, and being, at the same time, available as a sofa. A 6-ft. sofa makes a 12-ft. table. The slide is peculiarly arranged so as to leave no chance to get out of order.

POCKET KNIFE.—A. Kayser, S. F. Dated June 21, 1881. No. 243,071. This invention relates to that class of pocket knives the novelty in which is the peculiar construction of the handle and arrangement of the blades, whereby the said blades may be easily removable, and contained complete within the handle when not in use and pushed out therefrom when required, being held in place to prevent their unexpectedly closing up and hurting the hand. The object of the invention is to provide a knife, the blades of which can be easily removed and others substituted, and which, when not in use, will be convenient and harmless, the blades not being able to open in the pocket, and when in use will be held firm and rigid, the whole knife being substantial and not likely to get out of order.

HARROW.—Geo. S. Sperry, Willows, Yolo county, Cal. Dated June 21, 1881. No. 243,321. This is a peculiar sectional harrow, the two parts of which are connected by peculiar links, with notched or corrugated surfaces which give to the two sections a zigzag or vibratory motion and conform them to the character of the ground. An extended heel, or tube, carrying the teeth, is journaled on the frame; these teeth revolve between the interstices of the frame timbers, and are long enough to cut the straw or stubble beneath.

OIL STOVE.—B. C. Brown, S. F. Dated June 21, 1881. No. 243,202. This invention relates to an oil stove for heating and cooking purposes, the novel features of which are the details of construction of the oil-holding tank. The construction of the stove makes it possible to warm the room at the same time a cooking vessel is used.

What they Say about Us.

We append a few of the "notices" which we have received from our exchanges:

THE following we take from the Tucson *Journal*, the official paper of Pima county, Arizona, and one which ably represents the mining interests of the Territory: Interesting.—The MINING AND SCIENTIFIC PRESS of June 18th inst., is a magnificent 36-page edition, with a vast amount of interesting matter relating to the Territory of Arizona. Accompanying the edition is a map of the Territory, engraved from Riecker's of last year, with added corrections and additions. Besides the map there are illustrations artistically executed, exhibiting objects of historic interest, among which are the painted rocks of Arizona, etc. The PRESS contains a number of well and carefully written and condensed articles on the climate, productions, mineral and agricultural, of the Territory, original and selected, which may be read and acted upon with entire confidence in their truthful accuracy.

THE MINING AND SCIENTIFIC PRESS, of San Francisco, comes to us this week in the form of an Arizona extra, containing 36 pages, devoted principally to mining news of Arizona. A correct map is enclosed, showing the location of all the cities, rivers, districts, mines and railroads in the Territory. It is a magnificent number, and should be read by every one in search of information concerning Arizona.—*Globe Chronicle, June 23.*

WE have received the Arizona edition of the MINING AND SCIENTIFIC PRESS. It consists of 36 pages, and is an excellent number. In it we notice a letter from Prof. Lemmon, and another from Rev. Messenger. The PRESS is a good journal, and its columns show that it is prosperous.—*Phœnix Herald, June 24.*

Miners' Meeting at Sweetland.

At a large and enthusiastic meeting of the miners and citizens of Mississippi Valley mining district and vicinity, held at Sweetland, Nevada county, the following preamble and resolutions were adopted:

WHEREAS, We view with mingled concern and alarm the recent action of an interested and prejudiced court of a neighboring county, in issuing a restraining order, perpetually enjoining the miners of this county from the customary use and working of their mines in the manner indicated by the nature thereof and the conditions under which the same exist, as an attack upon the enjoyment of a natural right and fraught with great immediate injury and danger, not only to the mining interests of the county and the citizens thereof, but to the State at large, tending to adverse influence upon the national finances involving among the first sufferers of a deplorable success, the very interest in behalf whereof such attack is ostensibly made, for the cogent reason that a cessation or marked decrease of gold product heretofore flowing in the channels of trade, must inevitably unsettle values and create a depression in the price of cereals and other staple products of this coast. Therefore,

Resolved, That we view without any sentiments of jealousy the occupation and use of the rivers and streams of the State to the development and working of mines within its borders, as bearing most important relation to local, State and national interests. That we deprecate as most unwise the policy heretofore adopted by too large a proportion of the mining interest of the country, in substituting Chinese labor in part or any capacity for that of the Caucasian race, upon which latter must necessarily devolve all the duties and responsibilities incumbent upon the American citizen. That such policy has in no small degree impaired the interest and sympathy which should be extended to the mining interest, reduced the ratio of our representation in the Legislature of the State by discouraging the influx of an intelligent white labor element and compelling that formerly part of our population to seek other fields of employment, thus retarding the collateral growth and development of other resources and property interest and consequently increasing the burdens of taxation.

Resolved, To the end that the results of the policy above mentioned may be obviated as much as now possible, we ask the several managements of the various mining interests of the county, in good faith to pledge and promise to refrain hereafter from employment in any manner or in any capacity whatever of Chinese labor, and, in lieu thereof, to employ none but white labor in the mines of this county, and that we do hereby accord the mining interest our full sympathy and support in combatting the late restraining order issued out of the Rancher's Court, and we, calling upon our fellow citizens for moral support and physical aid, do hereby pledge ourselves to sustain the mining interest by all means in our power to the bitter end in assertion of a natural right against all action emanating from illegal sources tending to subvert and destroy such natural right, and in this spirit we ask the meeting to be held at Nevada City, in behalf of the mining interest of the county, to endorse and sustain the sentiments of these resolutions.

Resolved, 3d, That copies of these resolutions be transmitted to the press of the county for publication.

G. N. L. POWELL, Chairman.
FRANK N. WOOD, Sec'y.

Powder Explosions.

A powder magazine blew up at Tucson on the 27th, ult., which did a good deal of damage, but killed no one. From the associated press dispatches in the *Chronicle*, we take the following items:

The magazine belonged to William Zeckendorf & Co. and L. Zeckendorf & Co. The magazine was located one mile from the town. A member of the firm of L. Zeckendorf & Co. informed me that the magazine contained 1,000 cases of Hercules and Tonite powder, but it is generally believed that there was much more. Many persons sustained slight wounds from falling doors and glass, but no serious wounds have been reported. Many residences in the northern part of town are almost ruined. The doors and windows are torn from their fastenings, the plastering is shaken off and the walls badly shattered. Several houses took fire from the explosion or the breaking of burning lamps, but with no serious results so far as now known. The damage must be great, as nearly every house and building in town is more or less injured.

Last Sunday morning the powder mill at Clark's Landing, Alameda county, was destroyed by fire, and three men were seriously, but not fatally burned. The works were owned by the Alta Chemical Co., who manufactured a peculiar kind of powder for mining purposes. The building consists of two rooms, one of which is used for storing the powder and the other for manufacturing it. Charles Anderson, the engineer, was in one of the apartments hammering on some steel, when a spark lighted on his vest and set it on fire. Losing his presence of mind he threw the vest off, upon a heap of powder lying on the floor, which ignited without an explosion and set the buildings on fire. Prof. Monnier, the manager, and his son, barely escaped with their lives, as they were instantly surrounded by fire and had to grope their way through flames and blinding smoke. As it is, their hands and faces are seriously burned. The loss on the building, stock and machinery amounts to $6,000. The company will resume business as soon as the building can be restored

Hygienic Science Made Popular.

We all of us want to understand how these human frames are built, and what the different parts are good for. How to keep the live machine in running order; save it from every harm avoidable; repair it, when injured, at least expense, and get the best results from its harmonious working.

This want is better satisfied by Dr. Kellogg's "Home Hand-Book" than by any other work we know of. In the light of recent and trustworthy researches, and in a clear, forcible, entertaining style, he explains the structure and uses of the various organs, and states the laws and conditions of health. Causes of disease and how to avoid them receive special notice. Great stress is laid on heeding the first departures from health and nipping illness in the bud. The principles of rational medicine are set forth lucidly, and their application to disease is intelligible and practical. People of common capacity are thus enabled to adopt simple measures of treatment when a physician is not at hand or need not be summoned; to discern when professional services are really necessary, and, in the latter case, to discriminate between the wise, reliable doctor and the charlatan.

The chapters on diet, dangerous adulterations of food and how to detect them, stimulants and narcotics, drainage and ventilation, together with the plain, emphatic warnings against every species of reckless drugging, are timely and valuable. There are full instructions, also, what to do in case of accident—drowning, sunstroke, poisoning, etc. The cuts are numerous and generally good; the print is large and pleasing to the eyes; the binding calculated to stand service in a studious family.

Dr. Kellogg himself is a member of the Michigan State Board of Health, and highly esteemed for scientific attainments and professional skill, as well as energy, moral integrity and human ambition to do good.

A full table of contents and copious indexes make ready reference easier and increase the practical worth of the volume. Believing it to be the best work of the kind in print, we hope it will find its way into and bless many California homes. It is published on this coast by the *Pacific Press* Co., of Oakland.

News in Brief.

THE emigration from Denmark this year is estimated at 70,000.

THE iron foundry and machine shop at Yreka were destroyed by fire Saturday.

THE track of the Southern Pacific is now laid 22 miles east of El Paso, Texas.

THERE is a prospect that a Signal Service station will be placed on Mount San Bernardino.

THE trouble between the Italians and French still continue, and serious results are not improbable.

THE Richmond and Alleghany, Atlantic and Northwestern and Ohio Central railroads have consolidated.

AT rifle practice the regulars of the Presidio defeated a picked team, Saturday, at 200, 500 and 600 yards.

AN investigation into the affairs of the State Prison at San Quentin is to be had, at the request of Warden Ames.

A FIRE occurred in the San Quentin prison in the California Door Co.'s dry-house on the 25th ult. Not much damage was done.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. F. OSBORNE—San Francisco.
A. C. KNOX—Napa and Lake counties.
G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—Solano and Sacramento counties.
GEO. W. FAHRION—Plumas county.
GEO. H. HOPKINS—Amador county.
A. LEONARD MEYER—Utah and Idaho Ter.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We will send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

HOW TO STOP THIS PAPER.—It is not a difficult task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

ANDERSON SPRINGS, in Lake county, 19 miles from Calistoga (over a grand, picturesque route, via Mt. St. Helena) are among the best in this State. They are situated in the midst of a natural park, full of beauty and interest to the naturalist. Good home-like accommodations at reasonable rates are invariably furnished by the Anderson family.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus, terms of subscription, etc., and request that they circulate the copy sent.

THE State Mining Bureau, No. 313 Pine street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francisco.

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Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Arizona Mexican Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Globe District, Arizona.

Notice is hereby given, that at a meeting of the Directors, held on the 7th day of June, 1881, an assessment (No. 1), of Fifty (50) Cents per share was levied upon the capital stock of the Corporation, payable immediately in U. S. Gold Coin, to the Secretary at the office of the Company, Room 39, No. 320 Sansome St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 15th day of July, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 8th day of August, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

GEO. R. ADAMS, Secretary.
Office—320 Sansome St., Room 39, San Francisco, Cal.

ANNUAL MEETING.

GOVER MILLING AND MINING COMPANY.—The regular Annual Meeting of the Stockholders, for the election of a Board of Directors, will be held on Tuesday, June the 14th, 1881, at 2 o'clock, P. M., at the office of the Company, No. 402 Front street, Room 8, San Francisco California. W. O. WILSON, Secretary.

Steep Hollow Gold Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Liberty Hill Mining District, Nevada County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 21st day of June, 1881, an assessment (No. 6), of $1.50 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the Company, No. 310 Pine street, Rooms 15 and 17, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of July, 1881, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 18th day of August, 1881, to pay the delinquent assessment together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. W. PEW, Secretary.

Office—310 Pine St., Rooms 15 and 17, San Francisco, Cal

DIVIDEND NOTICE.

San Francisco Savings Union,

532 California St., corner Webb.

For the half year ending with June 30, 1881, a dividend has been declared at the rate of five and one-tenth of one per cent (5 1-10⅕) per annum on term deposits, and four and one-fourth of one per cent (4¼) per annum on ordinary deposits, free of Federal tax, payable on and after Wednesday, July 13th, 1881. LOVELL WHITE, Cashier.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending this date, the Board of Directors of The German Savings and Loan Society has declared a dividend on Term Deposits at the rate of five and one-tenth (5 1-10) per cent per annum, and on ordinary Deposits at the rate of four and one-fourth (4¼) per cent. per annum, free from Federal Taxes, and payable on and after the 11th day July, 1881. By order, GEO. LETTE, Secretary.

San Francisco, June 30, 1881.

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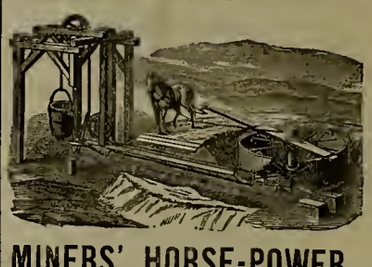

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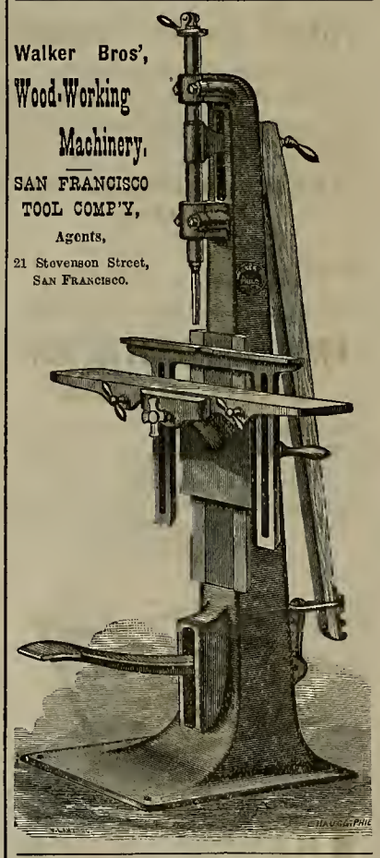

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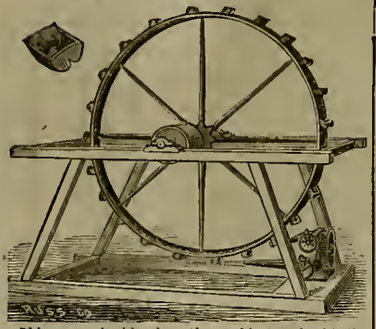

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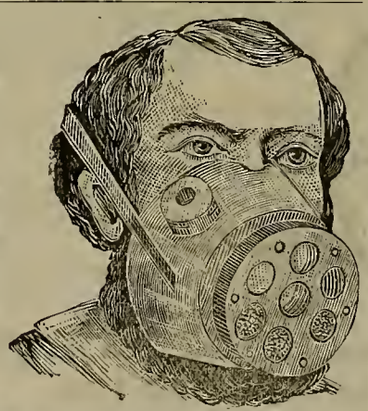
Prevents Lead Poisoning and Salivation.



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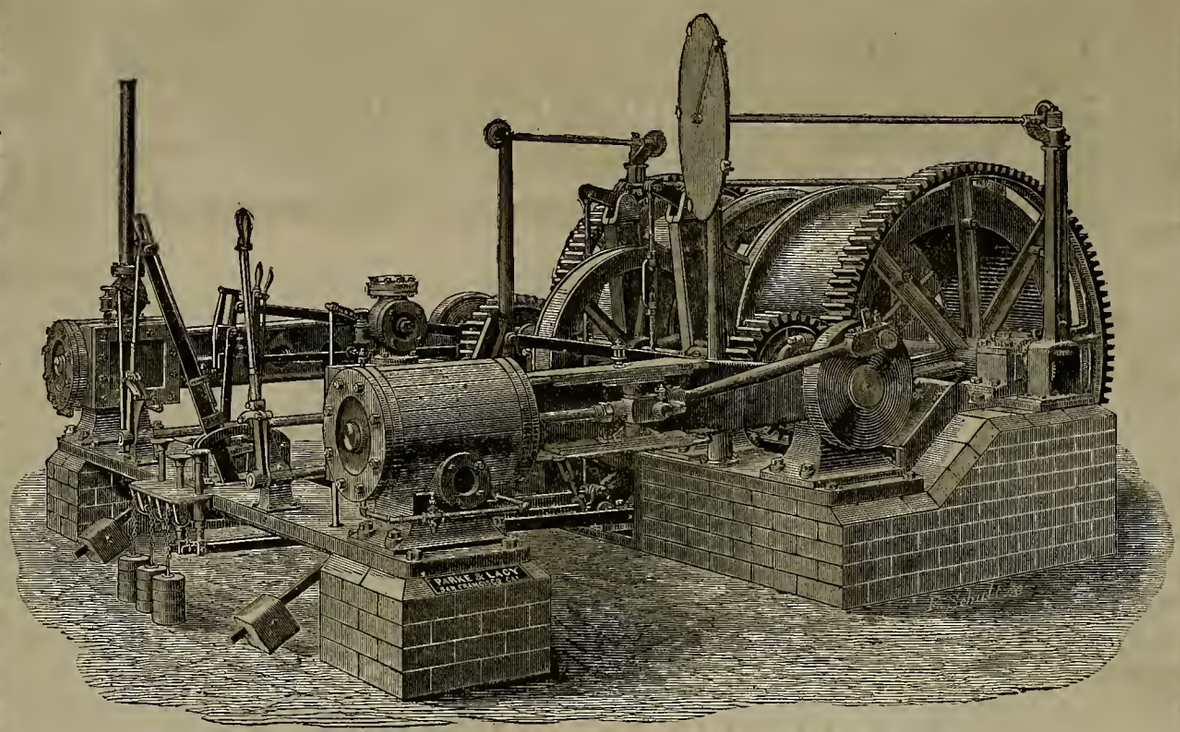

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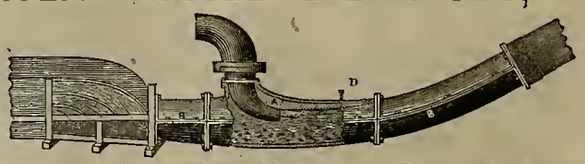

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 9, 1881.

VOLUME XLIII Number 2.

Destroying Base Metal Chlorides.

In roasting ores it is very difficult to get rid of all the base chlorides. They are formed under the action of chlorine and hydrochloric acid. The most of the metal chlorides are volatile, and a part is carried off through the chimney. Another part of the chlorides gives off some of its chlorine, whereby sulphates, undecomposed sulphurets, antimoniates and arsenates are chloridized. Chlorides, which are disposed to transfer chlorine to other metals in combination with sulphur or arsenic are: The protochlorids of iron and of copper, the chlorides of zinc, lead and cobalt. When, in this way, the most of the metals are chloridized, the base metals, principally iron and copper, are losing their chlorine gradually, being first converted into sub-chlorides, and then into oxides.

Mr. Kustel, in his "Roasting of Gold and Silver Ores,"* says that the roasting for the purpose of destroying base metal chlorides must continue with increased heat, even when the chlorination of the silver is finished. At an increased heat, the base metal chlorides lose their chlorine, while the chloride of silver remains undecomposed, unless a very high temperature should be applied. This process requires a long time, consequently also more fuel. The decomposition of these chlorides is greatly assisted by the use of 5% to 6% of carbonate of lime in a pulverized condition. Lime does not attack the chloride of silver, but it is not advisable to take too much of it, as it would interfere to some degree with the amalgamation. The pulverized lime rock must be charged toward the end of the roasting. First, 2% is introduced by means of a scoop, the whole well mixed, and then examined either with sulphide of sodium, or in the following way:

A small portion of the roasted ore is taken in a porcelain cup or glass, and mixed with some water by means of a piece of iron with a clean metallic surface. If the iron appears coated red with copper, some more lime must be added. In place of iron—especially if no copper, but some other base metal is present—some quicksilver is mixed with the sample. In the presence of base metal chlorides, the quicksilver is coated immediately with a black skin.

When endeavoring to expel the base metals by heat, the loss of silver, in presence of much antimony, lead and copper, should be investigated very carefully. Under certain circumstances it is not uncommon to find a loss of even 50% of the silver, if the chloridizing roasting is carried on at a high heat for a great length of time. The loss increases with the duration of roasting and with the degree of temperature. When such ore is under treatment, it is necessary to take samples during the roasting, and to examine the same for the amount of chloride of silver, and also for its loss, and to stop roasting when the highest percentage of chloride of silver is obtained without reference to the condition of base metals.

*For sale by Dewey & Co. Price $3.

THE FOURTH OF JULY.—As a rule, the Fourth of July celebrations in the larger cities throughout the country were laid aside, out of respect for the President in his affliction and in harmony with the feeling of grief which pervaded the country. Instead of rejoicing, there was suspense, anxiety and solicitude. It was fitting that the day should be memorable by the omission of celebrations. If the President recovers, there will be a general disposition to rejoice, and it is proposed to carry out the plans laid in this city in the celebration of Admission Day, September 9th. It strikes us this would be a very good arrangement.

THE FIRE FIEND has again broken loose in the grain. On the Fourth there was a destructive grain fire on Glenn's Montgomery ranch, 14 miles above St. John. About 2,000 acres of wheat were destroyed, and 12 or 15 stacks. About 400 men fought the fire for hours. No insurance. It is said to be summer fallow wheat, about 25 bushels to the acre.

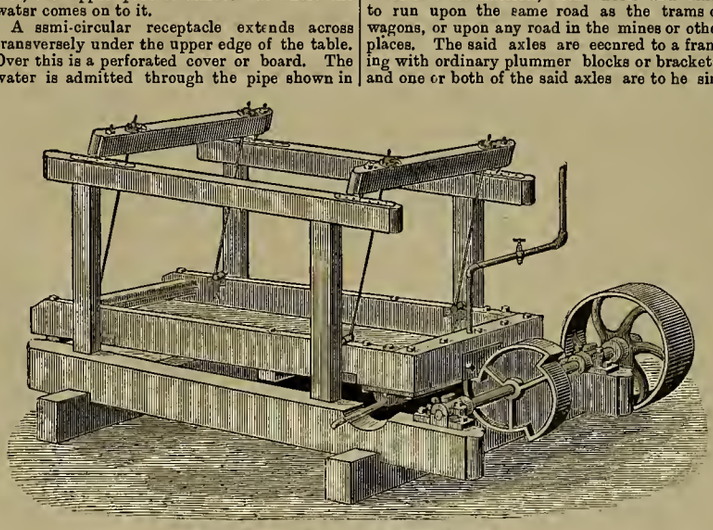
A New Concentrator.

We present on this page an engraving of the National concentrator, a new metallurgical appliance invented by Stephen Kendall, of this city, and for which he has applied for letters patent. The peculiarity of the concentrator lies in its power of not only concentrating the ore, but in separating from the concentrations the amalgam and particles of mercury, depositing each in a separate place.

It is built very substantially, is easily transported and can be run by hand, or direct from a main shaft without the use of pulley and countershaft. It is easily regulated according to the quality of pulp that is to be concentrated, and requires no skilled labor in either running it or setting it up.

As will be seen, the machine is like an ordinary percussion table. The lower portion of the table has more of an incline than the upper; in fact, the upper part is almost flat where the water comes on to it.

A semi-circular receptacle extends across transversely under the upper edge of the table. Over this is a perforated cover or board. The water is admitted through the pipe shown in



THE NATIONAL CONCENTRATOR.

the engraving, and is led down under this perforated cover, up through the perforations of which it flows smoothly and without any rush, or wash, or sudden flow. It then flows smoothly on, meeting the upwardly moving heavier particles, and sending the lighter portions down and away.

The heavier particles come on up, the jar of the machine moving them, until they pass through the perforations into the receptacle. The sulphurets can then be withdrawn from the tube shown in the engraving.

This tube or opening is not made exactly at the bottom of the receptacle, but somewhat above it. Therefore the amalgam, quicksilver and heaviest substances do not come out of the discharge when the sulphurets do, but remain there. When removed they are therefore separate. This machine therefore admits of continuous discharge both of the tailings and the concentrations, as will be seen from what we have said. The method of hanging the table is very good. It is hung out of the center so that no springs are needed to draw it back to the position where the cam wheel which gives its movement, will strike it.

All the bearings of this machine are well made. It is light and portable, and costs but $250. One of them may be seen in operation, corner of Main and Howard streets, in this city, at the National Iron Works, Marshutz & Cantrell, who are the sole manufacturers. The machine is now in operation at a quartz mill in this State, and Mr. Kendall informs us that it is doing very satisfactory work indeed. Mining men will do well to call and examine the machine in this city.

CYCLONE at Poughkeepsie, N. Y., on the 5th.

A Spray for Mine Galleries.

An invention which has for its object the prevention or mitigation of explosions in coal mines has lately been patented in England. It consists of an apparatus for automatically watering the galleries of the mine, and so laying the fine coal-dust which floats in the atmosphere of dry collieries and has so frequently contributed to, if it has not actually caused explosions of the most destructive kind. The inventors are well known. Mr. Kirkhouse holds a leading position as a mining engineer, and Mr. Lewis, of the Tredegar foundry, is already favorably known by many successful inventions. The present invention is thus described in full: "As the coal and other dust in the air in mines has been proved to be explosive and otherwise injurious to workmen, hence our invention. It consists of a cistern or cisterns carried upon a framing made of wood, iron, or steel, or any other suitable material, with wheels and axles to run upon the same road as the trams or wagons, or upon any road in the mines or other places. The said axles are secured to a framing with ordinary plummer blocks or brackets, and one or both of the said axles are to be single or doubled cranked, or fitted with eccentrics, from which a pump or pumps can be driven either full or empty as the tank travels along with the journeys through the mines and other places. The said pump or pumps are driven by the said cranked axle, axles, or eccentrics, and fed from the tank. At either end of the tank is fixed a circular pipe perforated with small holes or other openings, which are supplied with liquid from the pump, and forme a complete jet or spray as the tank travels, thereby laying the dust which is suspended in the air. The pump or pumps are fitted with a balance relieving valve and stopcock, so that the liquid can be worked through the pump and back into the tank without forming a jet or spray in case it should not be required, and thereby saving the liquid while the tank is still in motion." Such are the details of a patent which combines simplicity with power. It is a step, and a successful one, towards the prevention of the distressing accidents which periodically desolate coal districts. It will be useful in the mines on this coast for carrying fumes of high explosives.

MILL SITES.—Section 2 of the act of Congress approved January 22, 1880, entitled "an act to amend sections 2,324 and 2,325 of the Revised Statutes of the United States concerning mineral lands" does not apply to mill sites located separately or in connection with lode claims. No annual expenditures are required to maintain possessory title. This statement is made in reply to a "Nevada reader of the Salt Lake *Tribune*," and the reply is as given by the Acting Commissioner of the General Land Office to the correspondent of that journal.

Locating Coal Lands.

L. H. Bowers, Esq., of Austin, Lander county, Nev., asked the Department permission to renew a coal filing upon a certain land, the situation of which is not stated. The Acting Commissioner of the General Land Office, in reply, says: It is contrary to the rule of this office to permit a second filing upon the same land. If a second could be allowed, so could a third and fourth, and thus the disposition of the land could be indefinitely postponed, a condition of things not in accordance with public policy.

J. W. Rowley, of Colorado, asks that he be allowed to relinquish coal declaratory statement and make preemption filing for the same tract; and, as it appears from the affidavits presented that the land is not in part valuable for coal, and accordingly the Department directs the Register and Receiver to allow the preemption filing.

Edward S. Aiken, of Hawlon, Pecra county, Arizona, propounds the following: "A certain coal field, extending for about four or five miles in length and about one mile in width, has running through its entire length, a small strata of silver-bearing rock, which will carry $5.12 to the ton. Will the land have to be located as bearing gold, silver or copper? Is it subject to pre-emption for coal lands under Section 2,347, et cetera?"

The acting commissioner's reply, says: The land (inasmuch of it as contains the silver) must be located under the mining act of 1872. Under the regulations of this office, founded upon Section 7 of the Coal Act, the claimant under that act is required to testify to the non-existence (as far as his knowledge goes) of any vein of gold, silver or copper, which would be manifestly impossible in the present case. But if the land were located under the mining act, locators would be entitled not only to the silver vein located, but also to all other valuable deposits within their location and would get title to the land at $5 per acre instead of $10, the price demanded by the Coal Act. The remainder of the tract would then be necessarily located under the Coal Act and paid for in accordance with its provisions.

Taste and Odor of Minerals.

In their action upon the senses a few minerals possess *taste* and others under some circumstances give off *odor*. Taste belongs only to soluble minerals. The different kinds of taste adopted for reference are as follows:

1. *Astringent;* the taste of vitriol.
2. *Sweetish astringent;* taste of alum.
3. *Saline;* taste of common salt.
4. *Alkaline;* taste of soda.
5. *Cooling;* taste of saltpeter.
6. *Bitter;* taste of epsom salts.
7. *Sour;* taste of sulphuric acid.

Excepting a few gaseous and soluble species, minerals in the dry unchanged state do not give off odor. By friction, moistening with the breath, and the elimination of some volatile ingredient by heat of acids, odors are sometimes obtained which are thus designated.

1. *Alliaceous,* the odor of garlic. Friction of arsenical iron elicits this odor; it may also be obtained from arsenical compounds, by means of heat.

2. *Horse radish odor,* the odor of decaying horse-radish. This odor is strongly perceived when the ores of selenium are heated.

3. *Sulphureous,* friction elicits this odor from pyrite and heat from many sulphides.

4. *Bituminous,* the odor of bitumen.

5. *Fetid,* the odor of sulphuretted hydrogen or rotten eggs. It is elicited by friction from some varieties of quartz and limestone.

6. *Argillaceous,* the odor of moistened clay. It is obtained from serpentine and some allied minerals, after moistening them with the breath; others, as pyrargillite, afford it when heated.

The feel is a character which is occasionally of some importance; it is said to be *smooth* (sepiolite), *greasy* (talc), *harsh* or *meager*, etc. Some minerals, in consequence of their hygroscopic character, *adhere to the tongue*, when brought in contact with it.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Bishop Creek Mines.

Editors Press:—I have the pleasure of announcing the sale of ths Pajaro mine, the rich gold mine that I mentioned in my last. The transfer was made on the 25th ult, W. H. Lent, Jr., purchaser; considsration, $30,000. Mr. Lent was here in person, and is very fortunats in gstting possession of the propsrty. I understand he has left orders for the further prosecution of the work of development, with a view of ascsrtaining the extent of the ore body, and the size of reduction works needed. The shaft is down now 100 ft, and the ore will mill at least $75 per ton.

The people of Biehop Creek are very juhilant over the transfer, as all well know that where snch men ae Lent take hold, it means prosperity and revival of business. There is much more mining property here quite ae good, and it is truly an inviting country for the investment of capital. Concord.

Trout Ponds.

Editors Press:—Within three miles of Nevada City an old-time miner ie hard at work, utilizing the free waste water from springs and tunnele. The conformation of the ground favors the construction of lakelets and reservoirs, at trifling outlay of labor and money. The overflow passes hy three gates through wire screens, falling upon rock, and at present is conducted away through eide ditchee into a natural water channel. Ahont midway the length of the lakelet, a little island with yonng trees remains. Sometime it will have a rustic summer-house, and heds of hright flowers. This will create a desire to row, and necessitate a boat. This in turn will he a home attraction and amusement to each memher of the family.

At one of the side gatee the proprietor has constructed a feeding place 10 ft. in diameter, from which the water can be drawn. Thie he eays will enable him at pleasure to assort, count or divide the fish. In thie are little piles of emooth, white rocks. The baby fish were evidently familiar with the presence of their friend the owner, and in large numbers were waiting to he fed. He dropped clahhered milk into the still water npon the rock piles. Instantly, from the shady nooks they came by the thousand, until the water was thick with them. At our elightest movement, even at a ehadow on the water, they would scatter, frightened away, as rapidly as they came. The banks abont the feeding place are semi-circular and terraced one above the other. These are to have the eidee sodded, and the walks graveled. To accommodate the friends who may, as we did, seek the place to learn the habits of the speckled heauties, henches are to he placed there. The stock is young, consisting of 2,000 land-locked ealmon and 8,000 trout. The owner says that in three monthe those that came to the feeding placee have grown from the length of a grain of harley to two inches. At sundown, emall ae they are, their leaping out of the water after insects is a lively and intereeting eight.

As rapidly as possihle the series of excavations will he continued to make room for the increasingly large family. The intention ie to have nine of these narrow deep lakelets, fed hy pure spring water. The capacity of each to be from 8,000 to 10,000 fish. These lakelets are independent of natural water courses and hence not liable to he washed out hy spring floods. The gentleman has the help of two half-grown lads. The work is all done by hand, with aid of pick, shovel, amd wheel-harrow.

There is a possibility of fountains and a desr park. A long eide hill containing 40 or 50 acres overlooking thie eeries of lakelets can easily be fenced for that nurpose. Magnificent forest trees and clumpe of lilacs are ecattered over it. The eparkling waters can he conducted in an open ditch along the higheet line of this hill, and then be piped across to the lower hill for domestic and irrigating purposes. To date, not a drop of water has been carried on to the garden, hnt young fruit trees and emall fruits are growing thriftily within a ehadow length of pine trees 100 ft. high.

A four-roomed, two-story house last spring took the place of tbe miner's cahin. Wife and children, hooke and magazines and refinemente have come from town to share the amhition and give light and love to the willing worker. These people have a U. S. title to the land, but have very little money. How they manage to make expenses we will tell in our next.

Mrs. C. F. Young.

Nevada City, Cal.

A Notable Aerolite.—The State Mining Bureau has acquired the "Chilcat" meteor, so named becauee it was seen by the Chilcat Indiane of Alaska to fall, 100 years ago, and has heen preserved hy them. It is an aerolite, weighing 1,600 ounces, and was brought to the notice of Prof. Hanks hy John Muir, the well-known ecientist, some eight months ago. Through the Northwest Trading company, the Mining Bureau succeeded in negotiating for its purchase.

The Microscope in Geology.

The following paper of Melville Attwood, Esq., was read before the San Francisco Microscopical Society, June 13, 1881, "On the Gsology of Bodie, Illnstrating the Two Ages of Gold:"

At the time of the orgsnization of this association, ths subject of this paper, "The Geology of Bodie," might have hesn considered ill-suited to and out of place before a microscopical socisty. But at that time the microscope in geology may he said to have hsen quits in its infancy, and even at the pressnt time we are looking forward to great revslations hy its more extended applicstion.

The portion of that hranch of geology which the lats Mr. Jukes defined as "gsognosy," which is of real importance for *industrial purposes*, is that which inclndes the mineral composition and structure of rocks, such as csn he determined in the laboratory by the aid of hand specimens, and is termed "lithology" (etone lore). The use of the microscope in the hands of some of onr most eminent geologists, and the reeulte obtained by them from it, have proved this instrnment of research to be of the greatest value, or I may say, to be absolutely indispensable in that branch of geological investigatione just mentioned.

For the past eight yeare I have devoted a large portion of my time to the etudy of the walls or enclosing rocke of metalliferous veins, and have made minute and careful investigations of them, hut without the microscope my lahors would have heen of a most unsatisfactory character, as rocks of eedimentary or etratified deposits have the same chemical composition as those of an intrusive nature, and can only he distinguished hy the aid of the microscope. Eruptive rocks, for instance, whatever be their age, nnder microscopic examination exhihit certain definite charactere distinguishing them at once from all othere. No one on this coast is better able to bear testimony to the correctness of this statement than onr State Mineralogist, Mr. Hanks. I think I may venture to remark that no mining engineer'e or expert's report on mines can be fairly relied upon unless he is able to distinguieh the true character of the enclosing wall-rocks, and this he cannot do unless he

Understande the Use of the Microecope.

The exact methods of investigation demanded at the present day, will only regard snch terms as "favorable information," etc., as expressions of comparative ignorance, and the reputation of those using them must euffer greatly. A knowledge of the proper place for sinking shafts, driving drifts or crosscuts, is quite as necessary as to know how to use the pick, gad, drill and shovel, and I may say that the money that has been thrown away on the Comstock alone for want of euch a knowledge, would have built up manufactoriee in California that would have made it the envy of the whole world. Now, with respect to gold—aurifer-ons lodes or veine are not characteristic of any sedimentary etratnm or formation, bnt are alwaye met with in conjunction with the outburst of eruptive rocks, hoth plntonic and volcanic (I use the old classification of eruptive rocke, "plutonic, old; volcanic, new;" thongh I am well aware that evidence can he adduced to ehow that they graduate into one another, and consequently that it is more hypothetical than real), as representing, in my belief, a very marked and real distinction in the ages of the gold contained in the rocks; and I hope to ehow that the condition of the gold demonetrates clearly the character of the enclosing rock of the lodes or veins from which it was obtained. The gold of the first age, or that found in connection with plutonic rocks, being only elightly alloyed with silver, whilst that met with in the second age has, in some instances, been found to contain nearly 50% of silver. So that the condition of the gold in nearly every case I have examined has correctly indicated the

Character of the Enclosing Rocks

Of the lodes; and on the other hand, the etndy of the enclosing rocks has told me the condition of the gold I should be likely to meet with in them. Speoimens of gold accompanying this paper, which came from Grase Valley and Bodie, are rolled out into thin strips to show and illustrate the marked difference in the appearance of the two kinds.

I have carefully stndied this matter, and a collection of gold and wall rocks from nearly every part of the world confirme the correctness of these conclusions, which I believe to be of univereal application.

The gold in metalliferons *belts*, like that of the Comstock, which followe the contour of the east side of Mt. Davidson, or in the metalliferons channel of Bodie, which runs along the center of the ridge from Bodie Bluff, each contain a uniform proportion of eilver alloyed with gold, from the outcrop of the veins at the eurface to the deepest workings. So in the milling, say of the Bodie ore, the proportion of silver graine of the native alloy would he 37 grains, any in 100 above that obtained in milling would he from the minsralized eilver mixed with the vein matter.

The native alloy of the Comstock belt in every 100 grains contains about 43 grains of silver. Many who have not made careful examination of the rocks in the proximity of those auriferons quartz veins, which are enclosed or occupy the planee of "cleavage" in slaty rocks, the mother lode for instance, which appears to he on the line, and cansed by the outhnrst of eruptive rocks, might think that those veins had no connection with plutonic rocks, and that the gresnstone (really diorite), gsnerally mst with on the hanging walls of that lode was a sedimentary rock. Such mistakes are of frequent occurrence.

Specimen marked "A," also section cut from it, is from the hanging-wall of the Eureka mine, Grass Valley. The serpentineous character of a portion of this specimen is excesdingly intsresting. I am of the opinion that the serpentine to ths north of the Eureka and Idaho lodes, was originally an intrnsive igneous rock. Specimen "B," and section is from the Sierra Buttes mine; spscimsn "C" and section, from the Oneida mine, Amador, and specimen "D" and section from the Pine Tree, Mariposa. These are all associated with ths gold of the first ags.

The metalliferous or ore channel of Bodie, extsnds the whole length and brsadth of the ridge, *i. e.* from what is known as Bodie Bluff to Queen Bee hill, having a length of 10,800 ft. and a hreadth of 3,600. (See general view of Bodie, Mr. Anderson's map of that place).

The Prevailing Rock

Is a trachytic diorite, in almost every etage of alternation; the eame character of rock that forms the hanging wall or eastern houndary of the Comstock lode, and which appeare at the Comstock to occur in two forms—sheets and dykes. On the top of the Bodie bluff the rock ie what was called in the olden terminology, "Trachyte Amphibole Andesite." From the top of Bodie bluff to the lowest workings of the Standard mine, altogether a depth of 1,264 ft., the rocks, though apparently of very different varieties, are all really merely local differentiations of the eame rock, which can be seen and examined from the blnff to the Osceola shallow level; from that down to the Syndicate tunnel in the Tioga mine, in its workinge hslow the Syndicate tunnel and in the Standard mine down to the 1,000 level, making a section of 1,264 ft.

If you will examine the longitudinal section which I have placed under the general view of Bodie, the numhere marked on it indicate the different parte from which the specimens, which I now euhmit for your examination, were taken. These rocks belong to the latter part of the tertiary and the heginning of the post-tertiary periods.

Silver hill is in places capped by volcanic conglomerate; near the entrance of the Aurora tunnel and also south of the Queen Bee hill are eome basaltic rocks, sections cut from which very much resemhle those from American Flat on the Comstock. What is called the "white-cap" is a pyritoue greyish-white trachytic, very similar to that which is mentioned hy Mr. Dainhree in hie paper on "The Occurrence of Gold in Australia." Specimen No. 1 and eection, Bodie hluff; specimen No. 2 and section, Tioga mine; specimen B. 2 and seotion, Belvedere mine; specimen No. 3 and section, Bulwer tunnel; specimen No. 4 and section, Syndicate tunnel; specimen No. 5 and section, end of east cross-cnt, 500 level Standard mine; epecimen No. 6 and section, 430 level Bodie mine; epecimen No. 7 and section, 800 level Tioga mine; specimen No. 8 and eection, 500 level Dudley mine; spscimen No. 9 and section, 100 level Standard mine; epecimen No. 10 and section, White Cap, Silver hill; epecimen No. 11 and section, wall rock, Noonday lode; specimen No. 12 and section, wall rock, Noonday lode; epecimen No. 13 and section, hasaltic rock east of Aurora tunnel; specimen No 14 and section, Comstock, Gold hill, at 1,700 ft.

There Is a Jointed Structure

Running north snd eouth through all the Bodie ore channel, in which the planee of jointure have a north and sonth direction and a slight dip either to the east or west, in conformity with the configuration of the hill. These planes of jointure are either filled with clayey matter or veins, the former, ae well as the latter, though in a less degree, being metalliferous, and in reality this is what may be eaid to form the Bodie ore channel. There are two marked and dietinct classes of veins met with in the Bodie ore channel: first, large veine called lodee or true veins; and the eecond, small veins, gash or crevice veins—the first occupying portions of fissnree or rents, which divide and dislocate the jointed structnre, cansing a vertical displacement, generally on that side of the country rock, which forms the hanging wall. The amonnt of dieplacement, or "throw," as it is called, can easily be eeen and measured in sedimentary rocks, which have alternating bede of limeetone, shales, sandetones, etc.; hut in eruptive rocks, like those of Bodie, it is very difficult to make any calculation reepecting it. The underlie of the Bodie trne veins varies from 40° to 60°, these veins heing from a few feet to 30 ft. in width. The non-metallic or gangue portion of the lode conaists principally of quartz and carb nate of lime. The metallic portione are electrum and native silver, mixed mineralized metals in the form of cerargyrite and polybasite, etc., heside which a small quantity of magnetic iron and iron pyrites and what the minere term "wad"—an earthy oxide of manganese—is found. A large portion of the gold or electrum is met with in a loose and free etate, so much eo that it might nearly he eluiced out just as it comes from the mine. The Noonday and Standard main lodes belong to this class, though the Noonday underlies to the east and the Standard to the west. At Silver Hill, which is very correctly named, lodes, also of this character, are met with, euch ae the Oro, etc., in which rich and most heautiful specimens of pyrargyrite are found; also some rare silvsr ore, curionsly mixed with gold or electrum, has heen tsken from a mine called the Concordia, which I much regrst not having had an opportunity of examining.

I think the

Prospects of Rich Silver Mines

At the south end of the Bodie ore channel are very good. The second-class small veins, gash or crsvice veins, are very numerous at ths north end of the Bodie ridge. Thsy mersly fill portions of the planes in the jointed structure, their underlie heing the same as the dip of the planes of jointurs, which they sometimes follow down till intsrsected hy other diagonal joints running along diagonals into other dip-joints.

This class of veins is very limited in extent, and gsnerally give out at no inconsiderable depth. Many of these veins tsrminate in the hanging walls of the larger veins or lodes. With respect to ths filling of these vsins, vast periods of time must havs elapsed for such processee to have taken place. Rocke met with at or near the surface of the ground, and also thoee at great depths, appear never to be in a etate of rest; they are always changing or nndergoing some alteration—in a measure proving the *uniformitarian* doctrine, which maintains that all changes were produced by the slow and continuoue action of causes now in operation.

In the depression of the ridge near the north end (see general view of Bodie), the rocks "in place" are covered to a depth varying from 50 to 100 ft. by debris, consequently very few of the veine in that part of the ground have any surface outcrop, and are what the California miners term "hlind leads." At some fnture time I hope to be able to give you a detailed deecription of the rock sections I now suhmit to you, and analyses of the different rocke.

It ie perhaps unnecessary for me to add that there is no porphyry or felspathic porphyry on the Bodie ridge. The term "porphyry" means without addition or qualification, "quartz porphyry," a plutonic and much older rock than any met with in Bodie.

I never remember having seen any lode which was worth working that had porphyry for its walle.

I was in hope of getting analyses made of some of our California rocks at the laboratory of the Mining Bnreau, hut that usefnl and really necesaary part of that institution was etarved almost at its birth by the withdrawal of the necessary fnnds to carry it on; so that in future any important rock must be sent to England for analyeis. The mining commnnity of this State know either too much or too little; they huild gorgeoue and costly marble palacee for interaction in stock speculations, hut appear to be sensitively economical in supporting any institution that would afford practical instruction to the working miner. California, I believe, is the only civilized part of the world that can hoast of

Not Having a Geological Map.

The need of such a map and of a collection of the minsrals and rocks of the State, does not appear to he rightly understood.

In 1851 I assisted in making a collection of the iron ores of Great Britain for the indnstrial exhibition of that year; the reeults of which and the value of a geological map are told in a few words hy Prof. W. W. Smyth, in hie introdnctory lecture on the opening of the London School of Mines, 1852: "Few among the crowds, who, at the late Industrial Exhibition, ewept past the eeriee of iron ores brought together from all parts of Britain by Mr. Blackwell, could have prophesied that the collection of a half dozen of those eomber stones would give rise within a few months to an active industry which hide fair to develop a new phase in the gigantic phenomenon of the British iron trade. An example this, of the mutual dependence and assistance of the three eister eciences, where geological reasoning had to point out the tract in which a given formation was to he found; mineralogical observation to discover the actual deposit, and chemical analysie to determine the value of the ore."

The Cleveland iron ore allnded to occnrs in heds of from 15 to 20 ft. thick in the Middle Leas. So after the discovery of the ore at Cleveland, those interested in iron making had only to conenlt the geological map to know where to look for it. One-quarter of the iron production of Great Britain ie from that eource. I trust I may not he misunderstood in this communication, which is really a very humble effort to attract attention to improvements in legitimate mining. Are there not numerous sources of mineral wealth lying unemployed because we do not understand how to take advantage of them? I feel sure that enlarged opportunities of learning brought within reach of tbe working miner muet prodnce their fruite in due eeason.

In conclnsion, the resnlt of many yeare of experience in its nse, confirms me in the helief that the *Microscope in Mining*, with which the miner is enabled to distinguieh the trne character of the conntry rocks, will eoon be found to he an instrument nearly equal in importance, and as necessary in mining, as the compass is in navigation.

It is reported that the Dunkin mine of Colorado will omit ite dividend this month, not hecauss there is no money in the treasury, hut hecause the ore is not so rich. The first dividend of this mine was paid Novemher 1, 1880, at the rate of 7½c. per ehare, and the last wae paid June 2d at the same rate. During thie interval, 15 dividends were dishured, aggregating $200,200.

MECHANICAL PROGRESS.

Purchasing Steel.

The stael maker deals with three classes of customers. Tho first simply orders steel without knowing what quality to hny or what qnality he is going to get. The second explains the purpose to which tho steel will he devoted and lenves the quality to the judgment of the maker, or the dealer, as the case may be. The third orders the particular quality he desires, after specifying that the eteel must contain so much carbon, or possess certain properties which may seem most desirahle for the purposee for which it ie intended.

Customers of the first cless are generally the most ignorant. Wo menn ignorant so far as a practical knowledge of the qnality and usee of steel are concerned. The second clnss are conservative, and throw the hnrden of responsibility of selecting the steel upon the maker or dealer. While tho third nssumes a knowledge of the kinds and qualities of steel aud its adaptability to the purposes designed.

Ono of the chief trouhles in the steel trade is tho innhility of many consnmers to recognize the different qualities of eteel offered in the mnrket. Thns it frequnetly happens that n really first-class eteel is pushed aside and diecarded for a much inferior mske, simply because the consnmer is nnnhle to tell the differenco hetweeu the poorest nnd the best. Stesl is an article that cannot safely he purchased npon inspection.

Whilé it may he trne that the carhon in stsel, for ordinary practical purposes, may be detected hy the sight, there are other propertiee such as strength, hardness and working qualities that can only he determined hy mechanical tests, and herein lies the difficulty in selling steel. Some smooth-tongued salesman, representing an inferior hut good-looking steel, comes along and, instead of ehowing the cnstomer, hy the proper tests, what it can do, rather supplante these tests hy hie own plnnsihle commendations of its quality, and thns the consumer is whsedled into huying it, and finds sooner or lnter that he hne made a eerions mietake in trusting to the salesman's word, instead of demanding a physical test, and actually ascertaining the true quality of the material before purchasing. Of course there are many concerns where these tests are demanded in the first instance, and such houses rarely find themselves the victims of an imposition; for the eelling of a poor grade of eteel in the name of the hetter grades, is most certainly an imposition. It might he proper to say that we do not essert that it is the dnty of the maker always to stand the expense of these tests, as the determination of the quality is often of more interest to the consumer than the seller. Ae there is no general rnle without an exception, so the rule of requiring teets hefore purchasing a steel with which the consnmer is not familiar, may reasonahly he relaxed in favor of some of the oldest and hest estahlished hrands which have been teeted repsatedly hy the hest authorities, and whose qnalitiee are endorsed hy many of the moet experienced workers of eteel in the country. In such instances the purchaser relies not npon his own unaided judgment, not upon the interested etatement of the salesman, hut upon the testimony and experience of other consumers who are fairly supposed to he impartial judges.

The practice of seeking tenders of hids on specifications for steel, which prevaile among many large consumers, hoth in this country and ahroed, is looked upon with considerahle disfavor hy the producers of the highest grades of steel, hecause, as they allege, the tendency of snch methods is to indnce makere to allow a deterioration in the quality in order that they may meet the low price of competitive hiddere and yet retain their usual profits. The asking for sealed hids is a direct attempt to rednce the maker's pricee to the minimum. The hest steels are thus forced into competition with the poorer steels. If the purchaser is a judge of grade and quality, he may he willing to pay a higher price for one steel than another, hut if he is not, then the maker, to insure a aale, muat, in nine cases out of ten, mark down his own price or lose a sale. Sometimes the consumer is indifferent ahout the quality. He may he a maker of sham machinery or cheap tools, or he may use the steel where he is indifferent as to its strength or lasting qualities. In snch cases he does well to get the cheapest hids that he can; hut if he is making meritorious goods, certainly hia seeking for a competition among the eteel producers will not tend to help the quality of the eteel which they will make to fill hie order. If they do give their hest quality, it is that they think more of the reputetion of their steel than for the meaeure of their profit, or that the competition hrought forth hy the hidding did not run so far ae to ruin their chancee for a eatiefactory profit.

The difference in coet hetween the best eteels and the pooreet, ie not sufficiently large to warrant a manufactnrer, who deeiree to uee the heet, to change from a well known and thoroughly reliahle hrand to one of unknown quality and unfamiliinr make. And hence there ie no one thing that the user of steel ehould be more careful ahout than in changing off a quality of eteel that he knowe to he good, for one, the merita of which, as far aa he ia concerned, are yet to he determined. If a change ia made it ehonld only be aftor a moet thorongh trial of the new steel and a satisfactory determination of its qnality. And it mny be wall to state that it is never advisnbla to experiment with mora than ona mnka of steel nt a time, hecanse there is great liahility to confnsion as the different makee of steel nre likely to beoome mixed, when no definite determination ae to their respective merits can be made. Manufaoturers cnn readily see how this confnsion is linble to occur. It is now not infreqnently tha caso that larga manufacturers confine their teste to one eingle make until they have fully proved its qualities before trying another. The makere of steel ehould nlso learn one lesson from this, and that is, that after having estahlished n reputation for the qnality of their metal, they shonld strive to keep their future productions fully up to the standnrd, so that those employing them may have no occasion for making experimsnts with rival stsele.—*Industrial World.*

An Engineer on Faulty Boilers.

A practical engineer writes: "Most employers do not take into consideration that one engineer can consume from 25% to 50% more fuel than another; also, that expensee on repairs and other mnttere will he in the same proportion. The man hae run an engine, and that ie all that is required of him in the employer's opinion. As long as employers are of this opinion, who can wonder nt hoiler explosions? I eimply wonder thnt there are not more, when wa look ahout us and ese how hoilere are managed; hlown out when the masonry is overheated; safety valves overloaded and corroded to their eeats; gauge cocks etopped up; pressnre gmges out of order; hoilers corroded; flues chokad, and other had disorders. When we come to sec all this, we wonder there are not more crystallized, distorted, lagged and twisted hoilere, nnd not more explociens. I once knew an old flue hoiler that was so thin that the back end fell down, forcing the support through the shell. Thie hoiler had heen in constant use for many years; but business hecame dull, and it was allowed to etand for a short tima nearly full of wnter; and when the engineer ceme into the hoiler-room the day previons to starting, he found the hoiler in this condition, evidently too weak to sustain its own weight. I wae once called upon to run an engine in a large lenther manufactory. I fonnd that the gauge cocks hed not heen in use for a long time, and conld not etart them from their seats. On making inquiry I found that the engineer had for two yeare depended solely upon an automntic water gauge. Now we all know that any automatic arrangement for indicating the water level in a steam hoiler is not a reliahle device, nor is it possihle to construct one that is reliahle. When hoiler ownere become convinced that patent damper regulators, automatic hoiler feedere, low water alarms, fusihle plugs, etc., do not, with an ignorant engineer, make a hoiler safe and prevent explosions, the hetter it will he for the community, although I do not condemn their use, hut rather encourage their adoption, if properly cared for hy a competent man; hut it would he far hetter to pay their equivalent to n good man, rather than use them with a common lahorer ne engineer. I, for one, would not trust myself to lahor in a huilding where they use an antomatic hoiler feed, for pumping the water, and a common laborer to shovel the coal."

ZINC SHEETING FOR IRON SHIPS.—In a yacht recently lannched at Rutherglen, Scotland, the zinc is 28 ounces to the square foot, hetween wind and water, and at the bottom 28 ounces per square foot. Zinc is the only metal capahle of application without injury to iron, as it protects it from corrosion, and the combination of the two metnls causes the zinc to act as copper does on the hottom of a wooden ship. The sheathing zinc is attached directly to the iron plating of the vessel, no paint of any kind heing nsed. The places on the iron where these attachments are to he made are first hurnished with an emery wheel, and the alloy used ie a solder. The zinc plate is similarly prepared and placed in position, and amalgamation is produced hy the application of heat. The laps and hutta are then soldered together, and are either lapped or hutt-jointed together. The first vessel with this aheating has heen in work for nine months. It trades in canals and rivera ahounding in acida from chemical worka; all corrosion of the iron hottom of the vessel heing, according to the *Ironmonger*, effectually prevented hy the zinc sheathing.

PETROLEUM AS FUEL.—Russian engineera and technologists appear to he decidedly in advance of ue in respect to the utilization of petroleum in place of coal for generating motive power of every deecription. In the neighhorhood of the oil regione of Russia, crude petroleum ie very generally nsed for eteamhoat and locomotive propulcion, ae well ae for other uece in generating power where coal has hitherto heen employed. In heating power, petroleum ia eo decidedly anperior to coal, that no quection can be raised againet ita use on the acore of economy; and in all the experimente that have heen made with it in thie country, it hae demonetrated ite merits in the moet aatiafactory manner. Ruecian engineere who have occaeionally vicited thia country, have repeatedly expreeeed their aurpriee that, in a conntry like oura, where euch ahundant snppliee of petrolenm are availahle, its advantagea aa a fuel have not heen more fully developed. In thia respect, Ruasia, which is eo far hehind us in many other respecte, can teach us a valuable leeson.

SCIENTIFIC PROGRESS.

The Color of the Sun.

Prof. S. B. Langley, Director of the Alleghany Observatory, famous in the line of discovery in solar physics, ie about etarting on an expedition of scientific and popular interest. The mnin object of this expedition is to determine hy actual experiment the nmount of heat given hy the snn to the earth, and also the true color of the sun, as it would appear to an observer beyond our atmoephere. Numerous queetions of importance to meteorology are closely involved in thie inquiry, and hence it hae a direct practical hsaring. A liberal citizen of Pitshurg, Pa., who wishes thnt his name should not he made pnhlic, has defrayed tho large cost of the requisite npparatus, nnd aleo of the incidentnl expenses of the expedition. The co-operation and hearty nseistance of Gen. Hezsn, Chief of the Signal Service Bureau, hae been given to the enterprise, and it proceeds under his official direction. To attain its special object the expedition must seek one of the most elevated summite on the continent, in an extremely arid region, these two conditions heing essential. These are only to he found comhined in the remote localities of Arizona and Southern Californnia, in places far from civilization, and where the aid of government hy the War Department is indispensahle both to provide transportation and protection.

One of the ohjects of the expsdition will he to prove hy a new clase of experiments a curious conclusion which Prof. Langley has already arrived at: to the effect that the snn is not really a white, or yellow, or even a red ohject, hut that sunlight ie in reality "desply, darkly, heautifully hlue." We, however, see snnlight only through the delusive medinm of an atmosphere. Wa are in the position of people who nave heen looking through colored epectacles without knowing it. If we had alwaye looked at the electric light in this way—eay through yellow glasses—we ehonld have fully helieved it yellow. The proof that we have a hlue sun is, however, somewhat conclusive at present, and this expedition ie likely to add to the strength of the proof. Thie ie not merely a suhject of curions inquiry. If our atmosphere in reality has played the part of yallow glassce, it follows that an enormous proportion of the sun'e heat has never heen taken into account in those questions of ecientific meteorology which have a epecial hearing on climate, and hence npon agriculture and other practical affairs. Two adjacent stations will he selected, respectively at highte of 3,000 and 14,000 ft. for purposee of comparison, through their very different thicknesses of atmosphere. The *personnel* of the expedition will include at least eix specialists, of whom one will he an officer from the army, three from civil life, and two noncommissioned officere of the Signal Service. The expedition starts July 1st from Pittsburg.

UNITED MEETING OF BRITISH AND AMERICAN SCIENTISTS.—The rumor has heen started that at the forthcoming meeting of the American Association for the advancement of Science, to open at Cincinnati August 17th, a proposal will he suhmitted to extend an invitation to the British Association to hold their annnal meeting for 1883 in this country, in conjunction with the American Association, at some place to he hereafter decided upon. This enggestion, it is added, has heen received with much favor hy many of the leading memhers of the American hody in the United States and the Dominion, and the hope is expressed that the British society will find no insnperahle ohjection in the way in departing from ite usual custom of holding its annual meeting at home. Should the suggeetion hear fruit, the united meeting of British and American scientiste will douhtless he one of great interest to the friende of science in the two countries.

OBJECTS ON THE RETINA AFTER DEATH.—Much was expected from the discovery made hy Prof. Boll that the imagea of the ohjscts remain on the retina of animals after death. It was thought, for example, that the last scene of myaterious murder would he found hy properly examining the eyea of the victim. Actual tests have shown that the optogrnm can he of no use in detecting crime. Dr. Ayera made more than a thousand experiments in the lahoratory of Prof. Kuhne, at Heidelherg, and met with hut poor success. The hest result was ohtained hy expoeing the eye of a living rahhit, which had heen dosed with atropine, to a photographic negative, and even in thie case the optogram was imperfect, indietinct, and evaneecent.

FORMATION OF MOUNTAINS.—Speaking of the formation of mountains, Prof. Favre, of Geneva, hae eaid that the three systema which account for the origin of mountaine do not differ greatly from each other. Those who admit the syatem of elevations as the principal cauee would prohahly admit the formation of depreeione aa a eecondary cause, while thoee who give depression the firet place would aleo admit elevation ae a secondary factor. Laetly, in the syetem of lateral cruching there ie a general depreeion of the earth, aince there ia a diminntion in the length of the radiua of the globe, and yet there reeult elevationa of the gronnd in the midet of thie general depreeion.

Storing up Electricity.

The principle adopted hy M. Faure for storing electrical energy ie founded npon an inventien made some 20 yeare ago hy M. Plante, which he called a secondary pile, and which of itself was nlso a means of storing electric energy to a certain extent. M. Faure'e plan is described as follows: "It consists of two platee of lead immersed in water, acidulnted hy snlphuric acid. This pile is inert in itself, inasmuch as the two electrodes are identical; hnt if it he connected with an electric generator—as a voltnic hattery or dynamo-electric machine—oxidation tekes place on one of the lend plates, resulting in the formetion of a thin coating of peroxide of lend, while the other plate remains as metallic lend. The pile is then detached from the charging hattery, and the electricity remains stored up in it so long ns the polarization of the plate coutinues. When the two elcctrodes are joined hy n conductor, there is ohtained an electric current, intense hut of ehort duration; the pile ie discharged nnd the plates assume their normal condition. With a Plnnte conple, having one-half square meter of surface, the current is sufficient to heat to redness for about ten minutes, a platinum wire one millimeter in diameter, nnd from 7 to 8 centimetere long.

M. Faure's invention consists of an improvement on Plante'e pile, hy which its capacity for etoring electricity is greatly increased. This consiste in furnishing the lead plates with a quantity of the oxide at the start. Eech plate is covered with a layer of red oxide of lead, held in place hy pieces of felt fastened to the plates hy lead rivets. These are then rolled together in the ehaps of a spiral, and immersed in dilute acid. When connected with a hattery or machine the oxide on the positive electrode is converted into the peroxide, while that of the negative is retnrned to the metallic state. In this way the electricity can he carried from place to place, the capacity of the hattery depending, apparently, upon the amount of oxide with which the platss are enpplied.

Whether this method of conveying electric currents will prove more economicel than hy metallic conductore remaine to he seen, hut at present it looks rather douhtful. The May numher of the *Journal des Usines a Gaz* is largely devoted to a discnssion of this discovery, and from it we learn that M. Reynier claims that the Faure hattery will give out 80% of the power used in charging it. This etatement ie supported hy M. Dumas, who places the loss at 20%. M. Hospitallier, in *L'Electricien*, criticises thsse etatements, and claims that, taking into consideratien the losses eustained in the transformation from mechanical to electrical energy, hy the dynamo-electric mnchine, as well as that in converting the electrical power of the hattery into mechanical force, the most that can he ohtained from Faure'e hattery is 52 5% of the energy necesary to charge it. The ordinary method of transmission by metallic conductore easily yielde 60%.

As might have heen expected, the discovery of M. Faure has passed into the hands of speculators, who are making fortunes for themselves at the expense of those unfortunate persons who possess more money than foresight.

SPEED AT WHICH WINGS ARE DRIVEN.—The speed hy which some wings are driven is enormous. It is occasionally so great as to cause the pinions to emit a drumming sound. To this source the huzz of the fly, the drone of tha hee, and the hoom of the heetle are to he referred. When a grouse, partridge or pheasant suddenly springe into the air, the eound produced hy the whirring of its winge greatly resemhlee that produced hy the contact of steel with the rapidly-revolving stone of the knife-grinder. It has heen estimated thnt the common fly moves ite wings 330 timee per second, that is, 19,800 times per minute, and thet the hutterfly moves its wings nine times psr second, or 540 times per minnte. These movements represent an incredihly high speed even at the roots of the wings; hut the speed is enormously increased at the tips of the wings, from the fact that the tips rotate upon the roots as centers.—*Fraser's Magazine.*

SPEAKING TUBES NOT A MODERN INVENTION.—There can be hut little douht that speaking tuhes were used by the ancient Romans. The Rev. John Bruce says they ran along the whole length of the great wall which surrounded the city. An early Engliah poet alludes to them as follows, as quoted hy Mr. Bruce:

"Townes stood upon my length, where garrisons were laid
Their limits to defend; and for my greater aid
With turrets I was built, where sentinels plac'd
To watch upon the Pict; to me my makers grac'd
With hollow pipes of hrasse, along me still they went,
By which they in one fort still to another sent
By speaking in the same to tell them what to doe,
And sos from sea to sea could I be whispered through."

A CURIOUS EXPERIMENT in heat is performed with an apparatus devieed hy Dr. Graesl. The apparatue coneiets of three concentric veseele, separated hy annular spaces of ahout three-fourths of an inch. The outer epace ie filled with oil and the inner with water. The oil ia heated to a point ahove 212° Fahr., when the water hegins to hoil. Oil heated to 300° ie then introduced into the central veeeel, and falls rapidly to a temperature ahout that of the hoiling water. Dr. Grasal finds that thia central oil cools the more quickly the greater the heat of the outer ring of oil—a reeult seemingly very paradoxical.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending June 16		Week Ending June 23		Week Ending June 30		Week Ending July 7.	
Alpha	4¼	4.10	4	3¾	3½	3	3.10	3
Alta	4½	3.80	3.95	3.70	4.40	4	4¼	3.90
Andes	2.45	2.30	2.40	2.05	2.20	1.85	1.90	1¾
Ahlion	3.15	3.05	3¾	3.10	4	3.70	3.95	3
Argenta	20c	....	15c	....	15c	10c	10c	....
Addenda	....	....	....	....	25c	15c	25c	....
Belcher	3.70	3¼	3.65	3.30	3.40	3.20	3.35	2.65
Belmont	75c	70c	1	80c	85c	....	....	....
Best & Belcher	16¼	15	16¾	14¼	13¾	11¾	11¾	9½
Bullion	95c	85c	1.65	85c	1¼	1¼	1.40	1
Bechtel	90c	85c	1.15	95c	1½	1.30	2	1.35
Bells Isle	15c	10c	15c	10c	50c	10c	....	....
Bodie	7¼	7	7½	7	7	6¾	7	7
Benton	85c	75c	1	75c	1.20	1.05	1.10	1
Bulwer	2.90	2.85	3	2.90	2¼	....	2.60	....
Boston	60c	....	50c	40c	....	....	....	....
Black Hawk	....	....	25c	10c	20c	15c	16c	....
Belvidere	35c	....	25c	5c	....	....	....	....
Booker	5c	....	....	....	15c	10c	20c	....
Caledonia	60c	50c	55c	40c	40c	35c	25c	....
California	1.95	1.55	1.85	1½	1.40	1.15	1.20	75c
Challenge	90c	....	1	85c	1	85c	1	85c
Chollar	2.95	2¾	2.95	2.70	2.85	2¼	2.80	2
Confidence	4.95	4¼	4.80	4¼	4¼	3.80	4	....
Con Imperial	25c	20c	25c	20c	20c	15c	20c	10c
Con Virginia	4.20	3¾	3.90	3.35	3.30	2.70	2¾	2
Crown Point	3.10	2.90	3.05	2.60	2.45	2.10	2.45	2.05
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1½	....	....	....	1.10	60c	90c	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	75c	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Dav	1.60	1¼	1.65	1.60	1.90	1.65	1.80	1.55
E. Mt. Diablo	20c	15c	....	....	....	....	....	....
Eureka Con	33	31	32½	32	33	30½	31	....
Exchequer	1.60	1¾	1.60	1.35	1.40	1.30	1¼	1.10
Enchemeni	....	....	....	....	....	....	....	....
Grand Prize	35c	20c	35c	30c	50c	25c	40c	....
Golden Gate	3	2.85	3	2.90	2.80	2¼	....	....
Goodshaw	50c	45c	50c	45c	45c	40c	....	....
Gould & Curry	....	6¾	....	7	6¾	5¾	6¾	4.30
Hale & Norcross	4.90	4.60	4.85	4.35	4.40	3.85	4	3.20
Head Center	1½	1.20	1.80	1½	1.65	1½	1½	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	20c	....	10c	....	....	....
Julia	60c	50c	60c	45c	55c	50c	55c	45c
Justice	1.10	75c	1	95c	1.10	95c	1.10	90c
Jackson	50c	....	....	....	....	....	30c	....
Jupiter	25c	15c	....	....	....	....	....	....
Kentuck	2¾	2¼	2.65	2¼	2½	2¼	3	2½
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	30c	25c	25c	20c	25c	20c	25c	....
Lewathan	....	....	....	....	....	....	....	....
Locke	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2.80	2¼	2¼	....	2½	1¾	2¼	1¼
Martin White	....	....	....	....	....	....	....	....
McClinton	....	....	....	....	....	....	....	....
Mono	3	2.45	3	2.20	3.20	3	3.05	....
Mexican	13¼	11¾	13¾	12	11¾	9¾	9¾	7¾
Mt. Diablo	10	9¼	10	8¾	9¾	....	8¾	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1¾	1½	1¾	1.30	1¼	95c	95c	85c
New York	20c	15c	15c	10c	10c	....	....	....
Northern Belle	21¼	18	19	17	20	19	19¼	....
North Noonday	1.15	1	1	60c	90c	50c	50c	....
Navajo	85c	70c	70c	....	60c	....	85c	60c
Occidental	1.40	1¼	1¼	1.40	1.40	50c	1.40	....
Ophir	8¾	7¾	8¾	7¼	7¾	6¾	6¾	5½
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.55	1¼	1.55	1.40	1½	1.40	1.70	1.55
Oro	65c	60c	80c	55c	95c	65c	1.10	95o
Paris	55c	50c	....	....	....	....	....	....
Potosi	3.70	3.55	3.65	3.30	3.35	3	3¼	2.20
Queen Bee	....	....	....	....	5c	....	5c	....
South Bulwer	10c	5c	5c	....	35c	5c	....	....
Savage	3.95	3.70	3.90	3¼	3.45	2.95	3	2.45
Sag Belcher	8¾	7	8	7	7¼	7	....	....
Sierra Nevada	17½	15¾	16¾	14¾	13¾	10¾	11¾	8¾
Silver Hill	45o	35c	35c	25c	35c	25c	30c	....
Silver King	22¾	21¼	22	21¼	22	21¼	22	21¼
Succor	....	....	....	....	....	....	....	....
Summit	55c	25c	....	....	25c	....	....	....
Scorpion	2	1.85	2	1.70	1.70	1.30	1½	1.20
Solid Silver	1¼	....	....	....	....	....	....	....
South Bodie	10c	....	15c	10c	10c	5c	10c	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	40c	....	40c	35c	35c	30c	30c	25c
Tioga Con	60c	45c	75c	60c	65c	60c	60c	....
Tiptop	3.05	2.90	4.95	4	4.05	3.80	4	3.90
Tuscarora	25c	....	30c	....	25c	....	....	....
Union Con	16	12½	15	12¾	12¼	9¾	12¾	9
Utah	11¾	9¾	13	10¾	10¾	8¼	8¾	7
Ward	2¼	....	....	....	2¾	....	2¼	....
Wales	1¾	1.60	1.60	1¼	1¼	1.45	1.65	1.60
Yellow Jacket	6¼	5¾	6¼	5¼	5¾	4.85	5¼	4.60

Sales at S. F. Stock Exchange.

Thursday A. M., July 7.

590 Alta ..... 3.90@4
620 Andes ..... 1.50@1.55
210 B & Belcher ..... 3.95@4
430 Belcher ..... 2.70@2.65
285 Bullion ..... 1.05@1
280 Benton 1
495 California ..... 80@75c
2950 Con Virginia ..... 2.05@2
420 Chollar ..... 2@2.10
280 Crown Point ..... 2.10@2.05
700 Con Imperial 20c
50 Caledonia 25c
190 Exchequer 1.10
1060 Gould & Curry ..... 4.30@4.35
205 Hale & Nor 3.20
70 Julia 45c
100 Justice 90c
30 Kentuck 3
550 Mexican ..... 7½@7¾
505 Ophir ..... 8@8½
680 Overman ..... 1.35@1.40
815 Potosi ..... 2.30@2.20
90 Savage 2.45
930 Sierra Nevada ..... 8@8¼
400 Sutro 22c
555 Scorpion ..... 1.05@1
110 Utah ..... 7@7½
930 Union ..... 9@9½
300 Yellow Jacket ..... 4.70@4.60

AFTERNOON SESSION.

300 Argenta 10c
190 Bodie 7
50 Bechtel 1.95
50 Booker 20c
250 Day ..... 1½@1.80
50 Eureka Con 31
700 Grand Prize 40c
100 Head Center 1½
450 Holmes ..... 60@65c
140 Jackson 30c
160 Manhattan 2½
100 Mt Diablo 6¼
100 Metallic 50c
300 N Noonday 50c
50 Noonday 85c
40 Navajo 60c
180 Oro ..... 1.10@1.05
50 Scorpion 5c
500 S Bodie 10c
50 Silver King 22
300 Star 25c
200 Tioga Con 60c
310 Tiptop 4
40 Wales 1.60

Bullion Shipments.

We quote shipments siuce our last, and shall he pleased to receive further reports:

Plumas Water and Mining Co. for month of June, $5,555.27; Mt. Diablo, June 28th, $7,748.24; Indian Queen, 30th, $4,425.28; Western, July 2d, $14,056.24; Mt. Diablo, 1st, $6,693 37; Northern Belle, 2d, $7.710.67; Western, 2d, $14,664.12; Navajo, 4th, $4,000; Bodie Con., 4th, $3,300; Star, June 25th; $10,216; Christy, 27th, $1,881; Mammoth, 27th, $4,425; Ontario, 27th, $14,221; Germania, $2,950; Nevada, $2,000; Germania, 28th, $1,715; Pascoe, 28th, $1,625; Horn Silver, 28th, $12,000; Frisco, 28th, $5,000; Ontario, 28th, $8,174; Ontario, 29th, $9,285; Horn Silver, 30th $2,500; Bullionville, 30th, $1,828; Tintio, 30th, $6,942; Germania, 30th, $3,800; Mayflower, 30th, $3,600; Jay Gould, 30th, $3,400; Bullionville, July 1st, $3,743; Ontario, 1st, $13,383; Ontario, 1st, $11,964; Germania, 1et, $1,950; Pascoe, 1et, $1,370; Jersey, 1st, $1,330; Telegraph Extension, 1st, $2,100.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	California	14	1 00	June 20	July 25	Aug 15	W Willis	309 Montgomery st
Belle Isle M Co	Nevada	2	15	June 3	July 11	Aug 2	E M Hall	327 Pine st
Bullion M Co	Nevada	19	60	May 19	June 22	July 13	J M Brazell	328 Montgomery st
Belvidere M Co	California	11	25	May 27	June 30	July 16	C V Hubbard	310 Pine st
California M Co	Washoe	4	30	June 30	Aug 6	Aug 25	C P Gordon	309 Montgomery st
Equitable T & M Co	Utah	25	15	May 10	June 17	July 11	C J Collins	512 Montgomery
Equator M Co	Nevada	4	25	June 7	July 12	Aug 1	W Willis	309 Montgomery st
Grand Prize M Co	Nevada	5	25	May 27	Juue 30	July 20	E M Hale	327 Pine st
Mexican G & S M Co	Nevada	16	1 00	June 26	Aug 2	Aug 22	C L McCoy	309 Montgomery st
Mayhelie Con M Co	California	8	20	June 22	July 29	Aug 23	W J Taylor	310 Pine st
Martin White M Co	Nevada	10	25	June 18	July 30	Aug 25	H L Scoville	309 Montgomery st
Mono G M Co	California	12	50	May 19	June 24	July 14	W H Lent	309 Montgomery st
Murchie M Co	California	6	15	June 10	July 11	Aug 10	S D Rogers	328 Montgomery st
Oro M Co	California	8	10	June 1	July 5	July 24	W Stuart	320 Sansome st
Phœnix M Co	Nevada	23	10	May 9	June 15	July 9	H Loeter	308 California

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona Mexican M Co	Arizona	1	50	June 7	July 15	Aug 8	G R Adams	320 Sansome st
Benton Con M Co	California	5	25	May 21	June 24	July 12	W H Watson	302 Montgomery s
Betty O'Neal M Co	Nevada	1	50	June 14	July 19	Aug 9	R W Heath	318 Pine st
Derbec Blue Gravel M Co	California	8	10	May 11	June 16	July 9	T Wetzell	522 Montgomery
Eintracht Gray M Co	California	7	5	June 14	July 21	Aug 9	H Kunz	209 Sansome st
Excelsior Deep Gravel M Co	California	16	25	May 25	June 27	July 14	D B Chisholm	327 Pine st
Fresno Enterprise M Co	California	1	15	June 1	July 1	Aug 1	W H Alien	306 Pine st
Golden Gate Cou M Co	California	4	50	May 19	June 30	July 21	J T McGeoghegan	318 Pine st
Harrington M Co	California	2	5	June 15	July 20	Aug 11	I C Miller	409 California st
Holmes M Co	Nevada	2	10	June 22	July 25	Aug 15	E A Holmes	318 Pine st
Iron Clad Con M Co	California	1	1½	May 25	July 10	Aug 10	A Dott	309 Montgomery st
McMillen M Co	Arizona	3	20	Jan 12	June 12	July 27	J Morizio	328 Montgomery st
Mount Potosi M Co	Nevada	—	10	June 9	July 16	Aug 8	J H Sayre	330 Pine st
Noonday M Co	California	3	50	June 28	Aug 3	Aug 26	Wm J Traylor	310 Pine st
North Noonday M Co	California	3	50	June 28	Aug 5	Aug 29	Wm J Traylor	310 Pine st
Oakland G M Co	California	15	06	May 3	July 2	July 19	R D Hopkins	436 Montgomery st
Paris M Co	California	2	25	June 22	July 27	Aug 17	W J Taylor	310 Pine st
Occidental Con G M Co	California	7	04	May 9	July 7	Aug 2	W T Smith	414 California st
Paris M Co	California	2	25	June 22	July 27	Aug 17	Wm J Traylor	310 Pine st
Rocky Point M Co	California	8	05	June 21	July 25	Aug 15	W G Hughes	330 Pine st
Red Cloud Con M Co	California	10	20	June 22	July 27	Aug 17	W J Taylor	310 Pine st
Steep Hollow G M Co	California	6	1 50	June 21	July 26	Aug 18	J W Pew	310 Pine st
Spaulding G & S M Co	California	2	10	June 28	Aug 23	Sept 15	J W Pew	310 Pine st
Swamp Angel G M Co	California	4	12½	June 14	July 16	Aug 4	L Little	607 Washington st
Three Brothers S M Co	Arizona	1	30	May 25	June 28	July 20	C Meade	324 Pine st
Union Con M Co	Nevada	17	1 00	July 1	Aug 4	Aug 24	J M Buffington	329 California st
Utah S M Co	Nevada	35	2 00	June 28	Aug 5	Aug 23	G C Pratt	309 Montgomery st
Wolverine Gravel M Co	California	2	10	May 31	July 1	Aug 1	E J Blanding	325 Front st
Wide Awake M Co	Arizona	13	10	June 4	July 18	Aug 10	C Hildebrandt	Cor Bush & Mont'y

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Nesting.	Date
Associate Stock Brokers	S F	J W McClung	Stock Ex	Annual	July 11
Boston Con M Co	California	F E Luty	330 Pine st	Annual	July 19
Best & Belcher M Co	Nevada	W Willis	309 Montgomery st	Annual	July 11
Betty O'Neal M Co	California	R W Heath	318 Pine st	Annual	July 19
Champion M Co	Nevada	J Croskett	327 Pine st	Annual	July 12
Hillside M & M Co	Nevada	F Frankenthal	121 Battery st	Annual	July 9
Laguna M Co		A B Cooper		Special	July 16
Modoc Con M Co	California	J W Pew	310 Pine st	Annual	July 12
Mt Potosi M Co	Nevada	H Lowden	330 Pine st	Special	July 25
Old Union M Co	Nevada	E Hill	230 Montgomery st	Annual	July 13
Pacific M Co	Nevada	C T Bridge	224 California st	Annual	July 13
Utah S M Co	Nevada	G C Pratt	309 Montgomery st	Annual	July 12
Union Con M Co	Nevada	J M Buffington	309 California st	Annual	July 18
Yellow Jacket M C	Nevada	M Otey	Gold Hill	Anoual	July 18

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	June 20
Father De Smet M Co	Dakota	H Dean	New York	50	June 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	June 16
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	June 16
Silver King M Co	Arizona	J Nash	316 California st	25	June 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	July 12
Western M Co	California	C S Curtiss	309 Montgomery st	75	May 12
Navajo M Co	Nevada	E M Hall	327 Pine st	25	Mar 25

The Mining Share Market.

There is very little interest shown in the stock market, prices being pretty well off at present. The assessment on California is the sensation of the week. The Sutro Tunnel folks have cut through a vein 15 ft. thick from wall to wall, of which six ft. is solid quartz, with occasional spots of metal. This is 300 ft. east of the Yellow Jacket shaft and 67 ft. from the Kentucky line. As the vein is in andesite, and has a slight dip west, it is supposed to he a large feeder of the main ledge.

Although the hydraulic pump runs very well, it is not yet doing all that is desired, and new valves and air-chambers have been ordered and will he here in a week. Meautime the pump will he run in case of accident to the Norcross or other pumps.

The following companies had an indebtedness July 1st. Alpha, $17,329.39; Best & Belcher, $5,694.39; Bullion (including $142,866.66 due the Ward Co.), $149,162.62; Belle Isle, $10,567.88; Betty O'Neal, $16,710.90; California, $108,042 04; Con. Virginia, $57,803.51; Equator, $7,573.95; Gould & Curry, $6,250; Metallic, $8,690.92; Mexican, $31,850.15; Utah, $6,969.27; Union, $40,000; Wedge, $520.70.

The following companies had a halance on hand Jnly 1st: Alta, $21,589.75; Alhion, $16,204.66; Argenta, $11.20; Benton, $22,772.91; Bulwer, $69,954.02; Bodie, $17,509.10; Crown Point, $38,903.85; Challenge, $444.02; Chollar, $15,531.68; Con. Imperial, $12,573.92; Exchequer, $1,304.81; Grand Prize, $3,239.85; Hale & Norcross, $10,225.85; Independence, $1,806.78; Lady Washington, $2,765.45; Mt. Diahlo, $833.67 (the company still owes H. H. Allen $8,000—$7,586.16 in hullion not included); Northern Belle, $191,599.19; North Bonanza, $5,059.54; North Belle Isle, $1,792 38; Ophir, $40,262,39; Occidental, $8,370.67; Potosi, $8,672.88; Standard, $242,353.74; Sierra Nevada, $18,003.15; Silver Hill, $3,989.66.

Following are some of the June pay rolls, which will show what is heing done on the Comstock: Yellow Jacket, $10,594.25; Alta, $6,138.88; Benton, $3,054.16; Overman, $4,196.50; Caledonia, $1,280; Forman shaft, $8,188.54; Con. Imperial, $4,786; Alpha Con., $150; Exchequer, $150; Gould & Curry and Best & Belcher shaft, $8,105.50; Union shaft, $19,520.37; California, Con. Virginia and C. & C. shaft, $24,352.50; Ophir, Mexican and Union Con., $19,710; Crown Point and Belcher joint air shaft $4,515.50.

The bullion receipts at Salt Lake for the week ending the 1st, were $150,000.

Mining Rulings.

The acting Commissioner of the General Land Office, in reply to a Nevada inquirer, says:

First—A location of a mining claim may he made hy an agent.

Second—The certificate of a recorder of a mining district that work to the value of $100 has been performed upon a lode claim is merely prima facie evidence of such work. When a conflict arises hetween an original locator and one who relocates upon an alleged failure to make the required annual expenditures, the question of the true value of such expenditures is one of fact, to he determined in a snitable action hefore the proper legal trihunal.

Third—This office has no authority to regulate the fees of mining district recorders, or to decide when snch fees are reasonable and when excessive.

Fourth—Section 2, of the act of January 22, 1880, provides "that the period within which the work required to he done annually on all unpatented mineral claims shall commence on the first day of January succeeding the date of location of snch claim." Hence, a claim located on the first day of January, 1881, is not subject to relocation, for failure to perform the required annual labor, until the 1st of January succeeding the date of the original location, viz.: on the first day of January, 1882.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Massachusetts Con. M. Co.—June 5th. Location: California. Capital, $2,500,000, or 250,000 shares. Directors—W. E. Dornett, T. W. Hutchinson, S. A. Worrall, P. Crowell, A. C. Hammond, P. McMahon and C. L. Meyer.

Business Correspondent.—Wm. R. Bentley, a well informed Californian, has gone East on a tour among the larger cities on the other side of the mountains, as husinese correspondent of this paper. Mr. Bentley is well posted in matters pertaining to this cost, and those who meet him, desirous of information about this part of the country, will he able to learn many details. We hespeak for Mr. Bentley, among the patrons of the Press, a cordial welcome.

Esmeralda mining district has yielded about $15,000,000, and yet not even respectable gopher holee show for it.

Gen. Connor, authority in mining matters, says Bntte City, Montana, is the hest mining district on the continent.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Kennedy.—Amador *Ledger*, July 2: As a set-off to the discouraging fact of the complete stoppage of work at the Oneida mine and mill, it affords us pleasure to be able to announce that the Kennedy, adjoining the Oneida on the south, is developing into a splendid property The drift running north has encountered a body of quartz 12 ft in thickness, and said to be rich in quality. Indeed the future of the mine looks more promising to-day than at any time for many years past. Claus Spreckles, F. Riechling, and other prominent stockholders, were up here last week, accompanied by Mr. Skidmore, a mining expert. They came for the purpose of looking into the value of the recent discoveries for themselves, with the view of being better able to determine the best course to pursue in regard to future working. Two hundred tons of the rock is to be crushed as soon as possible, and if the yield comes up to expectations, it is generally understood that a new mill will ere long be erected.

BUTTE.

Electric Light at Cherokee.—Butte *Record*, July 2: The Spring Valley M. Co., of Cherokee, now have the electric light in successful operation in their mines. An effort was made to introduce the light early last spring, but owing to some defect in the machinery used to generate the electricity, the first attempt to introduce this modern illuminator did not prove a successful one. The light is said to have given entire satisfaction to both workmen and owners.

CALAVERAS.

Gleeson.—Calaveras *Chronicle*, July 2: Operations are being prosecuted in the Gleeson gravel mine, Cbils gulch. The incline is 350 ft in length, reaching bedrock, and the tunnel is continued on a level about 50 ft. A gravel crusher—a new invention—has been put up and it is said does its work well.

Glencoe Chips.—Forty men are at work on the ditch, which will convey the water to the Valentine. There are also several men at work on the ground where the mill will be situated. Within 90 days we expect to hear the thundering of 20 stamps in Valentine gulch. There are many leedes in this section. Our merchants wear smiling faces and seem to be greatly pleased at the turn business has taken in this locality.

Corral Flat.—The Corral Flat gravel mine, south of this place, on Corral flat, is in the very best order and running finely. The shaft is down to the ledge, about 125 ft, and timbering is now going on preparatory to drifting. There is an immense body of as fine looking gravel in the mine as ever was seen, and several pans of dirt which we saw washed prospected handsomely.

Norwich Mine.—On the 25th ult. the shaft had attained a total depth of 180 ft. This work has required months of unceasing labor, also an expenditure of many thousands of dollars, but it has been quickly prosecuted day and night. The absorption by this company of numerous mining claims in the vicinity of its original ground and elsewhere in the district would manifest an unusual confidence on the part of its directors in the future of the Norwich and the district wherein it is located The most recent purchase by this company is the extensive and valuable mine and mill property formerly owned by C. J. Garland, Esq. This property comprises an 18-stamp mill, favorably located in Mosquito gulch, easy of access from all mines in the district, and is run by a 50-horse power engine; the noted San Bruno mine, from which over $70,000 has already been extracted; the Good Hope mine, a westerly extension of the San Bruno, which has yielded over $30,000; the Monte Christo, lying south and parallel with the Good Hope and San Bruno mines, has yielded $7,500; also the Montana mine, located south of the Norwich and on the same lead, has yielded over $8 000. These mines are all in slate formation. They have been tested and found to be permanent and rich in free gold and sulphurets.

Railroad Flat.—Cor. Calaveras *Citizen*, July 2: The mining interest in this vicinity has experienced a genuine boom, and the end is not yet. The mineral resources of this section of country has not been fully appreciated. Those owning mines were too poor to develop them, and as a general rule, California placer miners weaken very quick when they strike water in a quartz claim, so that this has practically been a *terra incognita* to mining men and capitalists in general. The days of selling prospect holes is past, and the men bad nothing but prospect holes to show. But mining men have ascertained the fact that this section is rich in mineral wealth, and the consequence is that mining and prospecting is being carried on with a vim and energy herctofore unknown. The Chapman is running full handed. The Buena Vista is working a few men. The Vances is running as usual. The Valentine is to have a mill, the contract having been given to the Globe iron works, of San Francisco, the mill to be built in 90 days, to consist of 4 batteries with room for 8 more, and machinery of sufficient power to run them, so that they can have a 00-stamp mill if desired, though it will only consist of 20 stamps to start with. The old gravel claim known as the Fred Rence claim, near Railroad flat, will start next month. This claim has paid well in former days, and there is every reason to believe it to be good property.

EL DORADO.

Georgia Slide.—Georgetown *Gazette*, July 2: While there we visited the Cashier mine, worked by Morgan Bros. & Beattie Bros., James Morgan, Supt, and found their mine in good running order, and their new hoisting works all completed. Their shaft being down some 40 ft. gives them a good start. The Pacific, Beattie and Blue Rock mines are all being worked with good results.

The result of the crushing of the 50 tons of Eureka rock by the Cal. W. & M. Co.'s mill at Greenwood, has proven very satisfactory. The sulphurets are being sacked to be sent to the Auburn works, when the true value of the rock will be determined. A carload of the rock is now being sacked direct from the ledge, to be shipped to certain reduction works in the East. Already enough has been determined to justify preparations for extensive working of the mine.

A Rich Pocket.—*Mountain Democrat*, July 2: An exceedingly rich pocket has recently been struck in the old Spong claim, near Clarksville, this county. Last Tuesday over $2,000 worth of gold was taken out, and the daily yield for several days has approximated those figures. The formation is decomposed quartz.

Bullion.—Miners who have been up from the Springfield mine, Mud Springs township, and others who have been down from Grizzly flat during the past week, have given most encouraging reports of the present gold production of those several localities. The Mount Pleasant and Melton mines at Grizzly, and the Springfield mine, near El Dorado are getting out and crushing large amounts of fine ore, and realizing handsomely in bullion. Mr. Ball, engineer at the Grand Victory mine, also makes a favorable report. They are keeping their 40 stamps constantly running, and will have 10 more at work within a few days, and the singular ore they are working on still continues to make satisfactory returns in the precious metal.

MARIPOSA.

The Monesto G. and S. M. Co.—Mariposa *Gazette*, July 2: The works of this company, which are located about 6 miles southeast of the town of Mariposa, are daily increasing in interest, and attracting general attention. Almost daily we are brought in contact with evidences of certainty that this mine is developing rock averaging a maximum value considerably above any that we have heard of in this section. A week or two since we, by accident, were favored with an exhibit of a report of

assays of rock, made in San Francisco, which showed an average, taken from 9 separate assays, $50 and a few cents over to the ton. Quite a number from town and from abroad have visited the mine and brought away specimens of the ore, which are to be found on the counters and shelves of nearly every place of business in town. Hence the exceeding interest felt by this community.

NEVADA.

WASHINGTON MINE.—Grass Valley *Union*, July 2: The recent cutting of a fine ledge in the foot-wall on the 205 level of the Washington mine has given great encouragement to the members of the company, who believe they are about to be rewarded for their patient prospecting of several years. The ledge is found to be between 3 and 4 ft. in thickness of solid quartz, which shows well in sulphurets, but delay has occurred in opening upon it on account of a scant supply of water for running the pumping and hoisting. This difficulty will now be obviated, as a stronger head of water has been secured.

SPENCERVILLE COPPER.—Grass Valley *Union*, July 2: The Speuceville copper mine is now shipping considerable copper from the mine Ore is also being shipped from other mines in that vicinity, and as satisfactory arrangements cannot be made with the C. P. railroad for carrying the ore to San Francisco, it is understood that wagons will be employed to haul it to a point on Feather River and taken by boats to the bay.

THE EAGLE MINE.—Nevada *Transcript*, June 30: During the past month the miners employed in the Eagle mine, situated near Pine Grove cemetery, have had very tough and dangerous work to do. When near the bottom of the old incline, which it is proposed to sink 100 ft deeper, they found it badly caved As fast as the dirt was taken out a fresh cave would occur, bringing down tons of earth, which continued until the place was very dangerous to work in. Several times the workmen were about giving it up, but were persuaded to try again. Finally by erecting posts 16 ft long and 8 inches square, and putting heavy spiling on top, they succeeded in getting it timbered down to the bottom, and yesterday a force of miners commenced the work of sinking the next 100 level. Three shifts of 8 hours each will be employed, and as the ground is easily worked it is expected to make 8 ft every 24 hours. When this depth is reached a tunnel will be run to strike the ledge, which is believed to be close by, and the work of stoping out commenced. Judging from the value of the ore taken from the incline by the previous owners, the prospect is good for the development of a dividend paying mine.

NEVADA CITY MINE.—At the Nevada City mine the incline is being sunk for a 450 level, now being about 50 ft below the 350. Stoping is going on in the north drift of the latter level where the ledge is from 3 to 3½ ft thick, and rich in sulphurets and free gold. The 10-stamp mill is running to its full capacity night and day, and the clean-ups are satisfactory. The company contemplate discarding the use of steam this fall and running the mill, hoisting and pumping machinery with water which can be purchased at a reasonable rate from the South Yuba Canal Co. This change would effect a great saving.

PLACER.

PROMISING DEVELOPMENTS.—Placer *Herald*, July 2: The developments this last week in the Conrad mine on Duncan Hill, have been very satisfactory. In the tunnel, which is now in some 475 ft, they have struck rich ore, and in the new shaft, some several hundred ft easterly from the main works, they have struck rock at a depth of about 75 ft that is rich enough for specimens. These developments indicate that the pay chute is extensive, and that the ore is of a high grade. With their tunnel now about completed their facilities for working the mine to advantage are very good, and it is only reasonable to anticipate some paying clean-ups from this ledge now in a comparatively short time. The owners, Roberts & Roberts, have been very persevering, and any development promising success to their efforts is a pleasure to chronicle.

A MINE SOLD.—The report that Martin Schroeder had sold his quartz mine, located on North Ravine, a little over a mile westerly from Auburn, has been confirmed. The purchasers are J. W. McCullough, of Ohio, and Isaac Heald, of Iowa, and price paid was $20,000. Mr. McCullough, as Supt., will commence actively to develop the property at once.

IT IS REPORTED.—It is reported that the owners of the Valley Forge quartz mine on Bald Hill were recently offered $10,000 in cash for their claim. The ledge is a large one and the general understanding is that the ore is of a high grade. That the old Shipley ledge is developing into one of the finest quartz mining properties in this section of the country. The parties who have been working it recently, it is said, have thus far cleared $5 a day apiece, besides paying for the mine and paying all expenses. That T. J. Hunter, who recently renewed work on his ledge on Duncan Hill, is taking out some very rich ore. That the Mountain Gate drift mine, at Damascus, in which we believe there are 21 shares, declared a dividend about the first of this month of $400 a share. That the quartz mines in Humbug canyon, below Damascus are no humbug, but are turning out very rich.

PLUMAS.

PURCHASE.—Greenville *Bulletin*, June 29: We congratulate Messrs. Corbin, Manson & Co. on their good judgment manifested in their recent purchase of the gravel claim of Loring & Leavitt, near Quincy. It is proving to be immensely rich, and when a much larger force is put on the results will be proportionately greater. Last week with only five men there was taken out in gold the handsome sum of $3,055. Howard Corbin, son of one of the owners, has gone over there and will remain in charge.

NICE NUGGET.—Plumas *National*, July 2: On Friday of last week the miners in the Loring & Leavitt claim came across a chispa weighing a little over $200. It looked black and rusty, and could easily have been mistaken for an iron rock, but was altogether too heavy. The next few weeks will probably bring to light several more of the big slugs.

SIERRA.

WAHOO.—*Mountain Messenger*, July 2: The mining interests at Wahoo, near Port Wine, in this county, are looking up considerably. Several claims are being developed, and the prospects prove that there is a rich channel under the ridge. One claim working there is getting gravel that pays an ounce per day to the pick, with a fair supply of water to wash it. Phil. Dorsey, about two miles up the ridge, is running a tunnel with flattering prospects. The California claim, still above, are to run a tunnel to tap their ground lower down, enabling them to work to better advantage.

RICH FIND.—About a week ago A. Denmire found a rich quartz specimen containing 12 ozs. of gold in Woodchuck ravine. "There is more there," he enthusiastically affirms, "when you get to them."

QUARTZ.—Charley Quirollo, of Loganville, has discovered the croppings of a very rich quartz ledge somewhere on the hill north of that place. The specimen shown is very rich in free gold.

ITEMS.—The company owning the Sierra Buttes and Plumas Eureka claims have given orders that all supplies for the mines must hereafter be shipped by Nevada City instead of Marysville. The Extension Co. found a $12 piece a few days ago. The gold becomes coarser as they get further into the channel. The Chinamen have commenced to dam the North Fork at this place. A China company are putting in a dam on the South Fork at Lon Ward's.

ENCOURAGING NEWS.—Hugh McMahon, of Eureka, called on us this week. He said that his father, E. H. McMahon, will have a good crop of hay and potatoes this year. In the quartz ledge, one mile north of their ranch, midway from the canyon to the summit of the mountain, gold is clearly visible in the croppings. Prospecting will be done this summer toward its development. Parties from Scales have talked some about locating extensions of the lode. If this promising discovery proves to be very extensive, it will attract the attention of capitalists and probably inaugurate a prosperous era in mining for this part of northern Sierra.

SISKIYOU.

ITEMS.—Yreka *Journal*, July 2: The Kanaka mine is forging ahead, with Bill Pollman as head man The head dam will be completed next week, at which time they will begin work and run day and night. The Centennial, under the superintendency of C. Mott, will start to-day, and the prospects are that a rich clean-up will be secured. Several of the hands have been in town on a trial as witnesses, so that the work has been delayed. The Fort Jones claim, under Mr. Marsac, started last Monday and are working away like bees, and expect confidently to clean up a fortune before long. The Phil Mott claim, superintended by Phillip Mott, began last week and are working steadily ahead with admirable prospects. Indeed the whole Klamath country is rich in gold deposit. The Portuguese mine, under the management of Morgan Pipes, is working and panning out in a satisfactory manner. During Mr. Pipes' presence in town in attendance upon a law suit, the superintendency devolves upon Mr. Joe. Mr. Wm. McConnell's claim is being prepared for work and will start before long. The Lime Gulch claim, under Dick Smith, is down about 10 ft., and is running day and night, employing a force of 22 men. The derricks work admirably, and there is promise of a large yield when they clean up.

NEVADA.

WASHOE DISTRICT.

NEW YORK.—*Enterprise*, June 29: The mine is kept in good repair. Pumps running as usual.

SAVAGE.—Waiting on the successful operation of the combination hydraulic pump.

GOULD & CURRY.—Joinst Best & Belcher shaft sunk and timbered 20 ft; total depth, 2,015 ft.

JUSTICE.—Work has not been resumed in this mine, but the expectations are that it will be shortly.

SILVER HILL.—The repairing of the machinery will be completed this week ready for starting by the 1st proximo.

BEST & BELCHER.—East crosscut, 2300 level, extended 14 ft. Joint Gould & Curry shaft sunk 20 ft; total depth, 2,015 ft.

KENTUCK.—The guides in the shaft will be in place by Wednesday. The working of the lower levels will shortly be commenced.

CALEDONIA.—The pumps have been run an average of 10 hours per day, consuming 4½ cords of wood per day. The Forman shaft has been sunk and timbered 25 ft; total depth, 2,005 ft.

CON. IMPERIAL.—We are pushing operations on the 2,000 level and have resumed work on the 2,800 The connection on the 2090 level with the Jacket is entirely closed, but every endeavor will be made to re-open it as soon as possible.

ANDES.—The drift from the winze is now connected with the main tunnel, giving a splendid supply of air. We are now opening a station, preparatory to further sinking. The west drift was advanced 13 ft during the week, and still continues in very hard blasting rock.

AURUM DISTRICT.

A BRIGHTER PROSPECT.—Ward *Reflex*, July 2: We learn that when the mill shut down at Aurum Monday last the ore going through pulped over $100 to the ton. The cause of the stoppage was an ore car getting loose, and smashing up things in the incline, thereby cutting off the ore supply. We understand there is a large body of ore in sight, and that there will be no difficulty in keeping the mill running after damages are repaired.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, July 2: The shaft levels are looking and yielding about the same as a week since, the only important change being on the intermediate, between the first and second levels, which is running a crosscut at a distance of 70 ft from starting point opened out some good ore that looks promising, the developments being in new ground. The 11th and 12th levels are looking well and turning out considerable ore. The levels above the adit show well throughout, the 5th especially holding its own remarkably. The stopes on the 9th level present a fine appearance and are producing a good grade of ore. The total production of the mine averages 87 tone daily. Bullion shipments for the week ending June 29th amounted to $23,933.04; total shipments on June account to 20th ult., aggregate $91,437.07.

MOUNT DIABLO.—The winze from the third level and the various workings on this level show no change. Thirty ft below the second level, in a drift running from a winze, some very good ore has been struck, the extent of which is as yet unknown. The stopes on the second level all look well and show some improvement. The stope on the first level continues to open well and shows about the same as last week. Bullion amounting to $7,592.81 was shipped on the 24th inst., and $7,748.24 on the 28th.

CHERRY CREEK DISTRICT.

THE TICUP TROUBLE.—White Pine *News*, July 2: Wednesday last the Ticup mill was closed down under an attachment of B. F. Miller for $1,600. The mine closed down the following day. There has been an old indebtedness on the property, contracted before the mill was started up, which has embarrassed the manager here in meeting his regular pay-days with the employees, and notwithstanding, fair bullion shipments have been made since the mill started up, the out-put was not sufficient to pay off the back debt and meet current expenses. The fault no doubt lies with the directors in New York, who expect too much of their manager here, and have hampered him at the beginning of his operations. There is no question as to the merits of the mine and its ability to pay off all indebtedness, if given a fair show. We have it on undoubted authority that large ore bresstw are exposed on every level from the second to the eighth. Altogether, the mine looks well, and in view of this fact it is unfortunate that this new enterprise has been brought to a stand still. Indications, however, we are glad to state, point to an amicable adjustment of the present trouble.

THE YIELD FOR JUNE.—The Star mine has since the 1st of January last shown a steady and regular increase in its bullion product. In January the bullion shipment of the mine was only about $7,000, while in June it had reached nearly, if not quite, $44,000. Mr. Fleishbacker, a director and large owner of the Co.'s stock, was up from San Francisco several days this week. He was well pleased with the prospects here and stated that $20,000 of the pro rata indebtedness of the company would be paid off this month.

ESMERALDA DISTRICT.

DEL MONTE.—*Herald*, July 2: Rumors to the effect that the Del Monte Co. would shortly put in suitable machinery and properly prospect their mine have been rife on our streets for some days, but the *Herald* has been unable to confirm the rumor.

THE CORTEZ having developed ore sufficient to run a 10-stamp mill for several years, and the grade being very high; also, having secured a desirable mill site and a good supply of water, the question, "Why don't they start the building of the mill?" is agitating the public mind considerably. We are assured that in good time it will be built.

THE HUMBOLDT WEST.—Fair progress has been made in the drift on the ledge south, and the vein is now exposed 15 or 16 ft, showing a splendid character of ore.

THE CENTENNIAL is drifting on the 150 level. The face of the drift shows good ore. As soon as the ore now at the mill is crushed the incline will be driven down.

THE ROTHCHILD.—Ore of good quality is coming up the shaft, and before long a crueking will be made.

CORTEZ.—The incline has now reached a depth of 146 ft below the tunnel level, making the total depth from the croppings 253 ft. There are several hundred tons of $100 ore on the dump, while the developments in the mine have exposed many thousands of tons of equally high grade and some of much better ore.

EUREKA DISTRICT.

STRUCK A BONANZA.—*Sentinel*, June 2: We have it from pretty good authority that a genuine bonanza has been struck in the Geddes & Bertrand mine, On the 300 level a drift from the tunnel has encountered a body of ore of immense dimensions. It has been penetrated a distance of 60 ft, and there is no footwall in sight. Mr. Clark, the superintendent of the mine, has gone to Salt Lake, with view of inducing the proprietors of the property to erect a mill at once. The main shaft of the mine, in the meantime, is being sunk 100 ft deeper. In Secret canyon the news of the great strike is the general theme of conversation, and a great boom is expected for that region.

LEWIS DISTRICT.

NEW MILL.—*Silver State*, July 1: James Hendrn, of Star, passed west yesterday on his way home from Lewis, where he has been at work for some time. He says Lewis is one of the liveliest little camps on the coast. Buildings are going up in every direction, and the mines are looking well, reports to the contrary notwithstanding. A good deal of rich ore is being extracted, and the new 40-stamp mill is being pushed ahead. A contract is being let by the Morning Star Co. for a 40-stamp mill, which is to be built as speedily as possible. When these mills are completed there will be over 100 stamps at work in the district. Nearly all of the mines are owned by Eastern capitalists.

PIOCHE DISTRICT.

SILVER PARK.—*Pioche Record*, June 28: There has been some very high grade ore taken from the mines at Silver Park lately. We understand that Felix Knight will ship ore to either Eureka or Cherry Creek to have worked, he being able to ship it that great distance and make considerably more on his ore, than to ship it only a few miles to the works around this locality. This certainly goes to prove that the chloriders in Pioche have a very poor opportunity of making anything. Our reduction works are well up in the division business. After they get the chlorider's ore in their clutches they call the poor devil up and divide. The chlorider is frequently coupelled to get a microscope to see his share of the spoils, and then it cannot very often be seen. George Terry, upon being informed the rates charged for the reduction of ore while here, wanted to know where the chloriders' percentage came in. A man being able to ship ore in wagons 200 miles for reduction, and receives greater profits than he can by shipping it to reduction works only 30 miles distant, speaks for itself. No wonder so many of our chloriders have quit work.

RAYMOND & ELY.—On Sunday last a few men were placed to work repairing the shaft of this mine, it having commenced bulging at several places, owing to it not being in use. Everything connected with these works is kept in the best of order.

SEVERAL of the men working in the Mendha mine have become leaded. All of them appeared to be taken with the sickness at the same time.

RAYMOND & ELY.—*Record*, July 2: Judging from the turn things have taken, it is not probable that anything will be done with the Raymond & Ely property for the present. The parties wishing to buy the property have doubts as to Lazard Freres being able to give a good title, notwithstanding they guarantee perfect title. The Eastern stockholders and persons in San Francisco are determined to fight Lazard Freres for the possession of the property in the courts.

THE MILL of the Bristol Co., owing to being short of salt, was compelled to stop running for a few days. During the period the mill was idle the well was enlarged and some repairing done. The ore in the Mayflower mine is gradually improving, and the ore body growing more extensive as work progresses.

QUEEN SPRINGS DISTRICT.

THE MILL.—White Pine *News*, July 2: We learn that Supt. Dickinson, of the El Capitan mine at Queen Springs, is putting the company's mill in order preparatory for a run. He has a nice quantity of rich ore on the dump. It is the intention to start up the coming week.

SILVER CANYON DISTRICT.

BETTER.—White Pine *News*, July 2: Dr. Brooks was in town several days this week on business. He says the mines out that way look better than ever. The mill will resume operations again in about a week.

SOUTH MOUNTAIN DISTRICT.

COMMENCED.—*Silver State*, July 2: A letter received by A. J. Shepard from a friend at South mountain, says the Varcuff M. Co. have commenced operations as it they meant business. They own nearly all the mines in the camp, some 12 or 15 in all, and have commenced work on 5 of them. A Mr. Gove, of Salt Lake City, has charge of the smelting works, and is getting them in shape for work. The mines look well, and are producing some high grade ore. The new company seems to have plenty of money to properly develop the mines and pay for labor and material promptly. G. S. Mackenzie, the general manager, who arrived a few days ago, is elated over the prospects, and good judges of mines and ores see no reason why the company should not succeed.

SPRUCE MOUNTAIN DISTRICT.

AT WORK.—White Pine *News*, July 2: We learn that the Spruce Mountain Co. has commenced work on their property at that place, after a suspension of several years. They are repairing the furnace, have put men on the mine, and evidently mean business. Parties acquainted with the property tell us that the outlook at Spruce Mountain is very promising.

SWEETWATER DISTRICT.

THE MINES.—Esmeralda *Herald*, July 6: The mines in this district are attracting considerable attention. There is scarcely a day that the S. T. Co. do not carry down from 1 to 3 and 4 experts, capitalists, assayers or prospectors. The reports are all favorable. A. Soderling, of Bodie, who has just returned from that locality, is very favorably impressed with the mines, so far as surface indications go. The mineral belt is fully 2 miles in length, and many of the ledges are very wide, with strong formation. Dr. Summers has exposed a vast amount of rich ore in his mine and it is improving every day. It is not necessary for prospectors to go to Wood River, Arizona, New Mexico or any other distant places to prospect; there are just as good fields much nearer home.

WARD DISTRICT.

A CHANGE.—Ward *Reflex*, July 2: One shift has been knocked off in the upraise from the Martin White tunnel, and until connection is made two 8 hour shifts will be worked. It has been found necessary to pursue this course in order to allow the smoke and bad air to escape. The air has been so bad of late that it has been impossible for three shifts to put in anything like full time. For some time past it has been almost an every day occurrence for one or more of the men to be overcome or affected by bad air and smoke. The change will give 4 hours between shifts for the smoke to get out.

ARIZONA.

YUMA.—*Press*, July 2: Some new gold discoveries have been made about 3 miles south of Yuma, and several locations made by residents. The quartz shown us is very favorable looking. Work on two of the claims will be commenced at once. Verily Yuma is looming up as a mining center. Messrs Hance & Ashton own a fine gold claim 3 miles south of Yuma, and intend developing without delay. Healy & Mendez also have a location in the adjoining hill. These mines, in the neighborhood of town, are all on the main gold belt.

POORMAN'S DISTRICT.—The shaft on the Amelia is now down 40 ft. It follows the footwall and is entirely in ledge matter, with no sign of the hangiug wall. As far as opened the vein carries about 18 inches of high grade argentiferous galena ore. An open cut has been made across the croppings of the Boston claim, giving a good face for a shaft, which will soon be started. The ore taken from the diamond is similar to that of the Boston, and the quartz of the Boston, Diamond, Brilliant, Boss and Florence Eaton mines is of the same character and about the same grade. Negotiations are now pending with Eastern parties for the working of these mines on a large scale, and Poorman's district is undoubtedly destined for a bright future.

SILVER DISTRICT.—The Silent mine has shut down, pending the letting of new contracts. Franklin J. Clark, has put a force of men at work on the Black Rock, and the preliminary clearing away of the mesa dirt has unearthed a placer of rich silver nuggets similar to that out of which the original locators of the Red Cloud (now the Silent) took out over $9,000 in 2 months. Mr. Clark is having those nuggets sacked and stored so as to prevent their being stolen. Crosscutting still continues on the Klam. Nothing definite as yet. The remarkable body of ore recently discovered in the Clip mine still holds out, and has every indication of being an immense bonanza. S. S. Draper has let a contract for work on the Mendivil lode, lately transferred for a consideration of $50,000. There is an adverse claim to this mine, and the workmen were served notice to quit.

NORTHERN COUNTIES.—*Arizona Miner*, July 1: While the mines of the northern counties of the Territory have not had the send-off accorded those of the southern counties, the day is fast coming when their fame will resound far and wide. Yevapai, Mohave, Apache and Maricopa counties have some good bullion-producing mines, such as the Vulture, Tiptop and McCracklin. There are hundreds of other good mines that will be successfully worked soon after railroads, now being built, shall have pierced these counties. Let no man now falter and fall by the way-side in Northern Arizona, where there are at least 100 rich mines, out of several hundred poor ones; where poor men are every day making money by crushing little piles of rock in erastras with horse and mule power. Tuscumbia mill, running. Dake's furnace, on Lyon creek, is turning out bullion. Gov. Power's mill, near Peeples valley, is running and paying. The Belle mine, in Big Bug district, is yielding fine ore. The bottom of the shaft is about 300 ft below the surface. The Silver Belt is, as usual, giving up rich smelting ore. More bullion will soon come from it. Mr. F. W. Blake and other local capitalists are interesting themselves in mining, knowing that to this business must we look for success in almost everything. Mr. B. T. Riggs, formerly of Virginia City, Nevada, is doing his best to arouse our property owners to the necessity of opening and working good mines. We have good news from Mohave county, where mining for the precious metals is the principal industry.

COLORADO.

SHAFT.—*Register-Call*, July 2: Hon. W. J. Lewis and associates have let a contract to sink a shaft on the Manitoba lode 75 ft. When the depth shall have been attained, cross-cuts will be run. John Elliot is driving the Rocky Point tunnel, below Missouri falls, and has stripped considerable mineral in tunneling which has been left standing. Negotiations are pending for the purchase of the Garibaldi lode, owned by a party of Austrians, and situated below the Rocky Point. The tunnel started above the falls on Missouri gulch, and in the same belt as the Rough & Ready, Morse and Hard Money veins, although driven less than 100 ft, is showing up well. Sears & Morris, the owners of the tunnel, have taken up a mill site near the tunnel. At present there is sufficient water in the gulch to drive a 25-foot water-wheel. Locke & Hamilton are opening up the McIntosh lode, back of the Locke dwelling house, at Belford City. The ore is very rich, selected lots having brought 90 cents per pound at the smelters. The Toronto, owned by Dripps & Co., is turning out large quantities of ore, which comes from near the surface. Development of the Alaska vein is being made through a drift east at a depth of 160 ft But very little ore is being raised.

IDAHO.

WOOD RIVER.—*News*, June 29: Last week Ames, Altafer and La Parte bonded their Ophir mine, up Quigley's gulch, for $6,000. The boys received a considerable of the cash in hand. Doc Bisbop, J. Qualtrough and the Cowin boys own the Green Veil, an extension to the Occidental, in Greenhorn gulch, and Al. Cowin has gone up with a force to work on the Veil. The Occidental, on Greenhorn creek, was discovered last summer, and was always considered good. In fact a little work was done on it last winter, and it was then bonded for $10,000. Our informant stated last Monday that they had the mine in excellent shape for work now, and the pay ore was fully 4 ft thick; also, that Warren Hussey had offered the fortunate possessors $20,000 for their property.

BLANKET LEDGE.—Upon the very summit of Lookout mountain, east of Bellevue, is a veritable blanket ledge of rich galena ore, known on record as the Queen Victoria. It is the property of Messrs. Miller & Lusk, and for 2 or 3 weeks they have been stripping the ledges in an easterly and westerly direction, drifting a strip about 5 ft in width across the surface. The stripped portion is a curiosity, and well repays a visit to the summit of Lookout. Over the entire exposed portion lies the galena in sheets and bunches which will average about 6 or 8 inches thick. There is a dip on one edge which indicates that the vein will straighten up when prospected thoroughly. There is no estimating the extent of this "rich blanket," but the ore will be raised and sacked as soon as the sacks can be obtained.

MONTANA.

FURNACES.—Butte *Miner*, June 29: The Argenta furnace will be started up soon, with a good supply of high grade galena ore to run on that will yield good paying returns. Both stacks of the Glendale furnace are now running daily, and the per diem production is 12 tons of base bullion, valued at about $300 per ton. Ten tons of silver ore from the Blue Wing lode, Blue Wing district, Beaverhead county, was lately shipped to Salt Lake city, where the ore sold for about $251 per ton. The Alta-Montana Co.'s works at Wickes, now in course of rebuilding, will be more extensive than those destroyed by the late fire, and $200,000 will probably be expended by next fall on the works. Many of the lodes located in the McCarty district, in Madison county, are looking first-rate as far as developed, and from some of the openings ore is taken that assays high up in the ounces. A Sheridan correspondent says that the Montana M. & M. Co. is actively engaged, on Wisconsin creek, in preparing for the erection of a new 10-stamp mill, now at Dillon. The Broadway gold bonanza at Silver Star, in Madison county, is showing a larger body of paying ore in sight than ever before, and it is believed that $100,000 worth of free milling gold quartz is in sight in this celebrated gold mine. The driving of the long tunnel to tap the Excelsior gold lode in the Bannack district, owned by Phil Shenon, is progressing favorably. It is expected that the tunnel will strike the vein when it is driven a distance of 450 ft, and that the work will be accomplished by fall. When the mine is opened by this tunnel it will be in such shape that the extraction of a large amount of high grade ore can be cheaply and expeditiously accomplished.

OREGON.

NOTES, ETC.—Bedrock *Democrat*, June 21: The Camp Carson mines, owned by L. W. Nelson, of Salmon creek, near this city, are located in the mountains toward the head of Grand Ronde river, and are in charge of Kum Lum, a Chinaman of fine business attainments and well experienced in mining. He is employing 15 men, but will soon largely increase the working force. This mine has the finest water privilege of any mine in eastern Oregon, and the ditches cover a vast acreage of the very finest mining ground—indeed, the whole face of the country, for miles around, prospects well. J. B. Gardner, of this city, is doing well at his mammoth Trail creek diggings, situated about 9 miles from Camp Carson. Chinamen are in full force at the crossing of the North John Day, and say they, "bleep catch 'em plenty glood." Independence seems a little dull, however, we are informed by reliable parties, that the miners would take out "lote of gold."

FIVE bars of copper bullion, the product of the present run of the furnaces at Railroad district, have been shipped east, and teams are hauling more metal to Elko.

Plants Worth Trying in California.

The following ie Part III of the report of H. Behr and W. G. Klee, to the State Horticultnral Society, of plants mentioned in Baron Von Mueller'e "Select Plants," and which are deemed worthy of trial in this State. This hranch of the report was preeented at the June meeting:

Bamhoos: Under this head may he included all tree-like gressee, hnt especially those of a very hard and tongh nature. Of the vaet number of hamhoos fonnd in America, Africa and Asia, we find eome 80 different species mentioned as likely to succeed in euh-tropical countries. We shall mention but a few, not hecause we think them little likely to succeed or of emall importance; on the contrary we euhecribe fully to the eloquent plea of Ferd. V. Mueller, wherein he cells attention to their great usefnlness for a multitude of purposes, and we believe thet their importance can hardly he overestimeted for treeless countries, where along the irrigating ditchee they should he planted in every available spot. Our reason for naming but few is that the hotanicel names are generally not known in the countries where they are moetly cnltivated, except in hotanical gardens and their immediate surroundings. This is shown by the fact that even the government importations of last year are wanting in correct names. To give, therefore, a number of hotanicel namee, would he of little henefit to most people here who heve no meane of procuring hamhoo except hy getting them from the nativee and under the local neme of the country, he it Mexico, South America, Chine, Jepan or India.

Arnndinaria felcate: Is the Ringal or Nigala hemboo; a netive of the Himalaya mountains; fonnd at an elevation of from 3,500 to 10,000 ft.; it risee to the hight of 40 ft., with cenes, however, of hnt fonr inchee in diameter. The canes are etrong and dnrehle, and may he nitilized for a variety of purposes. In the Garden of Economic Plents in Berkeley there ie a plent of this species, raised from seed, hut 18 months old that has in three weeks made canes nearly eix ft. long, and thet without much moisture. This bamhoo ie hesides perfectly hardy, even where it is heaten down with enow every winter. It is, furthermore, easy to increase hy division and cnttings.

Dendrocalamne strictns: Recommended es reieeting great heat and cold; a!so for growing on *dryer* ground than hamhoos generally; attaining a hight of 100 ft. Its etrength and eolidity meke it very valuahle. It is fouud in India, speoially in Bengal. Seeds, donated by Baron Ferd. V. Mueller to the University Gardens, ceem to require great heat to germinate.

Bambuse vulgaris: Is the large unarmed hemhoo of Bengal; grows to the hight of 70 ft. It is, however, less hardy than any of the first named, thongh it will resist occesional frost, and might no douht find many localities in the Stete to euit its reqnirements.

Phyllostechys nigra: From China and Jepan; is a very hardy, hlack-stemmed species, growing to the hight of 25 ft. It is utilized for chairs and walking-sticks, as the canee are nearly solid.

In connection with these few named species, we muet mention that in the Gardens of Economic Plants in Berkeley are now growing five distinct epecies, derived from variouo sources, none of which we have heen ahle to determine the hotanical name of. Three of these were imported hy the Agricultnrel Department, and nemed *Bambusa metake, B. moso, B. tadake*, None of these are real hotanical namee according to the hest authority consulted on the snhject (Gen. Munro'e Monograph of the Bamboos), exoept perhaps *B. metake*, which, however, does not answer to the specimen on hand. All these are doing well. A fourth kind is the eo-called *moso*, a slender species of rapid growth in Japan, utilized as greens, like asparagus. A fifth is a direct importation from Choo-foo, China, planted right from a tuh into the garden. It esnt forth shoots that in less than three weeks have grown six ft. This epecies may possihly he *bambusa vulgaris*.

Before leaving the bamboos, we desire to repeat that we have the greatest appreciation of the importence of the bamhoo for California, and would he very grateful for any information and local experience in regard to these plants.

Boemeria nivea: The ramie. Although no meohine, ae yet, hes solved the difficulty in regard to the preparation of this fiher plant, it is gratifying to know that it ie perfectly hardy and well edapted to a greater part of Celifornie, as experiments in varions parte of California have proved. As a paper plant it might, perhaps, find favor, until the inventive genius of the Yankee has solved the difficnlt prohlem of constructing a ramie fiher machine.

Bœmeria tenacissima: Is, according to French and German seedsmen, the moct valuahle fiher plant, much snperior to *nivea;* this, however, ie contradicted hy the report of the Washington Agricultural Department, which eays that the two are identical for all practical pnrposes.

Buxns sempervirens: The tree hox. Ae the hoxwood is in constant demand and its supply in Asia Minor hecoming scanty, it is to he hoped that eome one will nndertake the planting of it, which, perhaps, will he an investment, slow in its returne, hut likely to he a sure and profitahle one in the end.

Chrysanthemum (Pyrethrum) Rosenm and Carneum: The ineect powder plants. Ae the oultivation of the *Pyrethrum cinerariefolium*, or Delmation feverfew, has heen started on a large scele, it deserves notice, that besides the nemed epecies, there are five othere that are utilized for this purpose, viz.: *tenuifolium, Wilde no vii, persicum, corymbosum, macrophyllum;* and though some have settled on the Dalmetian, others may he equal, or, psrheps, hetter cuited to some localities than others. The difficulty that hes heen experienced in getting seeds of the various kinds is now passed, es Prof. Riley has eent seeds of *roseum*, to several places in the State, and the Stockton firm have decided to sell their seed of *cinerariefolium*.

Diascorea, Yam: *Diascorea hastifolia* ie native of Weetern Australia; ie recommended es very hardy. *D. japonica*, the Japanese, and *D. glabra* (Batatas), deserve trial. The letter has letely heen distrihuted hy the San Francisco *Bulletin*. *Diascorea alata*, the Uvi yem, is a epecies that hails from the South Sea islande, hnt has heen grown successfully in New Zealand, and would most likely flonrish in parts of California, where too early night frosts do not occur.

Stillingia sehi fera (enphorhieceæ): The tallow tree of China; has heen naturalized in eome of the Southern Stetes, and is probahly perfectly herdy in the greater part of this State. A vegetahle tallow ie derived from the coating of the seede; hence the name.

Fatsie (Aralia) papyrifera: Is planted for ornament, and seeme perfectly hardy from San Francisco sonthward; as a source of the heautiful rice paper it might perhaps find more extensive use; it is the pith that is utilized.

Fourcroya longæva: Ie a near relation of the Century plent (*Agave Americana*), from the high mountains of Mexico, at an elevation of 10,000 ft. It reachee gigsntic size, with a stem 50 ft. high, and a penicle of flowers about 40 ft. The fiber obtained from this, as well as from the perhaps less hardy *F. gigantea*, ie very strong.

Guizotia oleifera: From India and perhaps Abyssinia, is the source of the Remtil oil, utilized like the Bene oil (*sesamum*), for culinery purposes as well as in various industries. It is a yellow-flowered, coarse looking composite herh, that seeme perfectly adapted to the hay climete, meturing in Berkeley good seed, where the season is too cold for the Bene. The seede of this plant are also known ae Niger eeeds in the London market.

Indigo: The various epecies of Indigo, *Indigo pera, Anil* and *Tinctoria*, are douhtless well adapted to the southern part of the State as far as heet is concerned, hut with irrigation and consequent additional lahor it is perhape a great question whether it conld be produced at a figure low enongh for competition.

Jubæe spectahilis: The Coquito of Chile, is one of the hardiest palms. In its netive home it is ntilized for the production of a syrup for which the tree is regularly tapped. It is said to he very prodnctive. The young plent resemhles closely the date-pelm.

Kentia sapida: The Nika palm of New Zealand Chatham islends, ie a heautifnl palm yet hardly known in this country. The nnexpended flower stalks are nsed as pelm cebhage.

Liquidamher Formoscena: From Chine, givee a species of sweet gum utilized for feeding a kind of silkworm.

Liquidamher orientalis: From Aeia Minor, yields the vanille-scented liquid storax, prized in perfumery.

Maouttia Puya: Is a etingless nettle like the Remie, utilized for ite fine fiher. It is an Indien plant found as high as 4,000 ft. elevation.

Maranta ernndinacea: Is the true arrowroot of commerce. The cnltnre of this plant ie comparatively eesy. It has, as far as we are aware, been cultivated with snccess in Fresno county.

Nicotiana persice: The shiraz tohecco, is recommended as adapted for more moist and cool climate.

Plectocomia Himalayensi: Is one of the hardieet rattan pelms.

Pogostemon patchouli: A labiate (mint-like) herh that produces the patchouli so much used as a perfume. It deserves notice that the seede of *Hibiscus Abelmoschus* (*Abelmoschus* hy the Germans) hes been introdnced to this country, the Department of Agricultnre having twice received seed of this from two different eources. The true petchouli is a native of the mountaine of India.

Quercus Aegilops from S. Europe: Is a nearly evergreen oak, the frnit of which is *available* for dying and tanning; the cupe are called velenie, while the nnripe acorns are celled camate; ripe, they may he eeten. The tree is furthermore a line avenne tree.

Pueraria tuherosa: From S. Asia, is a tall, woody climher helonging to the pea family (*Leguminoseæ*), the tuhere of which are long, and rich in starch; it is perhaps the same species as *P. Sieboldii*, that in Japan furnishes a euperior starch. This plant hae heen tried with snccesss in the Garden of Economic Plants, in Berkeley, where it grows without irrigation, sending out vines 12 to 15 ft. long in a few months.

Quillaya Saponaria (Rosaceæ): The Spanish hark or soap-hark of Chile, is the product of this tree. It reachee an enormous size. Seeds are very light and apt to be ahortive; due care should be taken to have them perfectly ripe for shipment, or they will not keep.

Rhamnns cblorophorus (*Rhamnaceæ*) Buckthorn family: From the hark of this Chinese tree is a very euperior green color derived, utilized particularly for silk. *R. utilis* is another speoies used for the same purpose. The dye from theee trees ie oalled Lokao.

Rhue vernicifera terehinthaceae: Is a medinm eize tree of Japen, yielding the true Japen varnish. This ae well ae its close relation *Rhus succedanea*, are hoth well adapted to the climate around the bay, as treee grown in Berkeley show.

Rhus Coriaria: The tanner'e eumech, is a oonth European species, the foliege of which is extremely rich in tannin, and in great demand. This epeciee can douhtless he grown with euccess on dry ground, ae the plant not alone prefers it, hut ite product here ie superior. The attention should be called to propertiee of the native California sumech that are very rich in tannin—*Rhus integrifolia* especielly, an evergreen epecies abundant on the eouthern coast. The poieon oek (*R. diversiloba*), might no douht also produce a fine varnish, if the way of handling it with impnnity was studied ont.

Salix purpurea: From Europe and Asia; ie one of the hetter Osier willows. Thie species, as well as the real Osier, *S. viminalis* and *S. triandra*, should be planted along water courses, instead of the native more or lese hrittle epecies. Cuttinge of these could, in proper season, be shipped with the greatest safety.

Stipa tenacissima: A gress found in South Europe end North Africa, known as the *Esparto*, or *Atocha*. Ite principal use, of late, hes heen for the manufaoture of paper, hut as it is content to live in dryest spots near the desert, it may prove valnahle as a forage plant. The plant deserves speciel trial.

Vahea florida: A native of Weet Africa, but fonnd np to 2,500 ft. elevetion. Is a heautiful climher, with white, fragrant flowers, the plant yielding ceoutchouc.

Santo Domingo Mines.

J. P. Lee, Superintendent of the Sento Domingo group of mines owned by Lyman A. Smith and others, returned from the scene of his labore last Saturday. He was here to make his regular monthly report and will leave again for the mines in a dey or two. He reports a greet deal of activiy in the Santo Domingo district on hoth sides of the line. The working eheft on the San Emeterio ie now down 35 ft., and in the last three ft. the ore vein increased 14 inches in width. The ore is still of the eame charecter, rich chloride and sulphurets. The Piteya is constantly improving as depth is attained. The main shaft on the Fresh Start is down 75 ft., with 35 ft. of drift from the hottom. An immense hody of free milling ore is heing uncovered.

Work is progreesing on the Guadalupe and the developments are line. Thie is a contact vein lying hetween granite and slate. A 10-ft. shaft on the Turner mine has exposed a vein of ore 22 in. wide that averages $500 to the ton. Six hundred ft. farther along the lode, another shaft is heiug pnt down. A force of men is sinking on the El Manto, on top of the divide, sontheast of the old workings. Work has just been commenced on the Mammoth Copper end Silver lode and it prospects exceedingly well. Mr. Lee hae made a new strike in the neighhorhood of the Sen Emeterio mine, encountering the same character of ore. He hae also, in connection with Simon Hermen, located a gold and silver mine not fer from the Guedalupe.—*Yuma Free Press.*

Magnetic Separation of Iron Sand.

One of the American contrihutione for the Electricel Exhihition at Paris is a modification of Mr. Edison'e magnetic separator for the treatment of iron sand found in large quantities on the south ehore of Long Island and in other locelities on sea coests. According to Mr. Batchelor's etetement to the N. Y. *Evening Post*, the Long Island sand conteins 26% of the finest iron known. Innumerahle attempts heve heen made to seperate the send, and magnetic plates have been used hefore, hut with no success on eccnnt of the presence of what is known as titanite iron, a suhstence which spoils iron. Edison discovered that titenite iron was less megnetic then the pure iron particles, and constructed his separatpr with that fact in view. The sand falls a distance of 4 ft. in a thin stream from a elit in a V-shaped box, holding ahout a ton. Under this box is a receiver divided into two compartments, the dividing pertition heing placed nearly under the elit in the send reservoir and parallel to it. If no magnet is hrought into play the sand ell falls into one side of the hox; hnt when a powerful magnet ie hrought near enough to act npon the falling ehower, the pure iron perticles ere deflected in their fall and fly on the other side of the pertition. The particles of titanite of iron are not attracted equally with the iron, and are not deflected sufficiently to fall into the compartment with the pure iron. A company has been formed for the extraction of iron from Long Island send, and ie now at work with its first machine at Quogue, near Moriches, on the Great South hay. This machine, which cost $700 to make, ie managed hy one hoy, who keeps 6 men and 2 carts busy hringing eand for his hopper. It treats 100 tons of sand a day, prodncing ahont 20 tons of pure iron, costing $1 a ton to produce and eelling for $6.

THE Hihernia Con. Mining Co., of Leadville has declared a dividend of 10c per share, or $30,000, payahle at New York July 2d. This makes $180,000 in eix months.

THE Denver *Tribune* says that the Good Luck Mining Co., paid its second dividend of $5,000 on the 7th of June, the firet of $2,000 having been paid April 1et.

Steam Wagons.

Steam wagons are elowly gaining entrance to industrial use on this coast. In Nevada, they are employed for heavy freighting, and in this State they are heing urged as well fitted for hauling grein to the river lendings. There are many favoreble conditions for the use of steam wagone on tbis coast. The long, dry eeeson, during which most of the hanling has to be done, eneures a hard road bed and none of the vexation of mud, as in countries where enmmer ehowers are frequent. Another great adventege is the almost dead level and exceedingly eesy gradee which characterize onr velley roadways. True there is high fuel and sometimes scarcity of water which must be counted on the other side of the eqnation. However, the steam wegons are going to have thorough trial, in hande of those who believe in them, and this will demonstrate their euccese or failure. The Colusa *Sun*, which has an open eye for all improvements likely to edvence the producing interests, says:

After all his experiments, Captain Roberts, of the San Joaquin Co., is still an enthusiast about his steam wagon enterprise. We had a conversation with him sometime ago, and he thinks that roads suitable for his wagon can be built very cheaply. While the wagons run, and pull very heavy loads on common roads, he thinks of digging two small graded ditches and filling with gravel, which will pack as hard as iron, and give a solid road for each of the broad wheels, and for the wagon wheels that follow with the loads. The Chico *Enterprise*, of Tuesday, has an item to the effect that this "steam wagon has been thoroughly overhauled and improved at the Union Iron Works, Sacramento, and on a recent trial worked satisfactorily. Its weight is 17 or 18 tons, and it is calculated to haul 50 tons of grain at each trip. It will be taken to the Upper Sacramento valley in a day or two, and will engage in grain hauling between Riceville and McIntosh's Landing." Capt. Roberts will, if this one shall prove the success he anticipates, put on wagons to run to all the principal landings on the river, and thus cross-section the entire Sacramento valley. He will have in effect a freight railroad across the valley, from foothill to river, every 8 or 10 miles. We sincerely hope that the wagons may prove successful, as it would be one of the grandest things for the Sacramento valley that could be imagined; that is, always provided we can keep the navigation of the river from being destroyed.

Yes; and the last proviso is most important. We can ill efford to he-mud our rivers or neglect our oceen facilities. Our prosperity depends upon keeping all avenues open and then pushing our varied products into all parts of the world.

MILL SITES.—Where a mill site abuts ageinst the end of a lode claim, the natural presumption ie raised that the vein or lode extends heyond such end line and into the mill site. In a recent decision of the Secretary of the Interior it wes held, however, that this presumption ie not conclusive, hut mey he rehutted. Evidence may be suhmitted to estahlish the non-mineral character of the mill site, hut evidence usually accepted ae satisfactory in the case of a non-adjacent mill site, is insufficient where the lode claim and mill site are in actual contect. The evidence you recite is insufficient in eny event, for it is only alleged thet "no known vein or veins of quertz, or other rock in place, beering gold, silver, cinnahar, lead, tin or oopper exist on seid mill eite." Itsbould he further shown that there ie not within the limits of such land eny plecer, cement, gravel or other valuahle mineral deposit; and that no portion of said premises is claimed for mining purposes; also proof that actual development shows that the vein or lode does not extend heyond the end line of the claim, and such other evidence as will demonetrate conclusively the non-mineral character of the mill site.

LOCATION.—A mine owner in Utah pnts the following conundrum to the Commissioner of the General Land Office: A located a mining claim Decemher 10, 1879, and performed no lahor thereon during the year 1880. On Decemher 31, 1880, B mede a re-location of the seme ground, and on January 1, 1881, C made a location. Under thie statement of the case he asks to be informed: "Which location givee possessory title?" The Acting Commissioner replied today: "Thet thie office has no jurisdiction over questione of this character. Should either locator apply for patent hesed npon his locetion, and proceed in due form of law, patent would issue unless an edverse claim should he filed hesed upon either of the adverse locetions, whereupon proceedings wonld he suspended until the right of possession should he determined by the courts."

CITIZENSHIP AND MINING LOCATIONS.—The Department decides that the United States citizenship of an individual applicant for a mine may he proved hy the affidavit of the applicant made hsfore any officer authorized to administer oaths within the land district where the claim sought to he patented is located. This, of itself, however, is held to he the lowest grade of evidence of snch fact, and does not inhihit applicant from employing other modes of proof. To prevent delay, annoyance and unnecessary expense, the hetter way is to estahlish citizsnship hy the affidavit of one or more diointerested witnesses, and in this case it is not material whether such affidavits are sworn to within or without the land district where the mineral entry is made.

A NEW 30-stamp mill for the Farwell Con. mine is now heing pnt up at Leadville. The oompany is incorporated in New York, and is already working a 20-etamp mill.

The Engineer.

Tapping Eagle Lake.—The tapping of Eagle lake, in Lassen county, is an enterprise that bids fair now to become accomplished, and will be one of vast interest to the county. This enterprise, which will require the running of some 9,000 ft. of tunnel, or open a cut and a flume 17 miles long, will irrigate and open up for settlement about 100,000 acres of as fine agricultural land as there is in this valley, but which now is almost worthless, being covered with a growth of sagebrush. The parties interested in this project are known to have plenty of money, and will doubtless prosecute the work to completion. They will not be obliged to look to irrigation alone for dividends, as the lake has on its borders a vast supply of excellent timber, which can be floated down their flume with ease. The company have now on the ground engineers who have made the necessary surveys, and are now sinking shafts along the line of the proposed tunnel to test the ground to be encountered, and which thus far is much more favorable than expected.

Underground Railways in New York.—The subject of underground railways in New York City seems now to be fairly approaching a solution. A company has been organized to connect by a tunnel railway the Hudson River tunnel and the railroads which enter the city from the north and east by way of the Fourth Avenue improvement. The route will be from the outlet of the Hudson River tunnel, under Wooster St. and University place, to Fourteenth St., thence by a curve under that street to Fourth avenue, under which it will run to Forty-second St. It is to be a double-track road at least 18 ft. below the surface. The object is to carry freight and ultimately passengers under the city to New Jersey, so that cars may run direct from Boston or Montreal to New Orleans, Charleston, and other Southern cities without the annoyance and delay of a New York transfer.

The Channel Tunnel.—It was announced the other day that experimental borings for the tunnel between Dover and Calais had turned out very successful, but experts say the scheme is a visionary one, and eminent engineers laugh at on what they consider a wild freak of imagination the part of Sir Edward William Watkin. They want to know how the dirt is to be removed and ventilation secured for the workmen. It would be absolutely impossible to work trains enough through such a tunnel to make it pay, unless enormous passenger and freight rates were charged. Sir Edward's estimate that the seven ft. driftway can be completed in five years is ridiculed as a gross absurdity. The whole affair is probably meant as an attempt to raise the wind for the S. E. railway, of which Sir Edward is President.

A Railway Tell-tale.—A very ingenious machine has been recently invented on the Erie railroad. It registers the speed of trains, when and where they stop, and how long. It is used especially for freight trains, and is fastened at either end of small cabooses or at the side of large cabooses, about four and a half ft. from the floor. It was adopted because freight trains frequently exceeded the prescribed rate of speed. They would run very fast for some distances, and then take things comfortably for a time.

Pumping Machinery.—Speaking of the machinery used in our western mines, a prominent mining engineer recently said that in some of the deep mines there are employed single engines capable of raising a column of water weighing 90,000 lbs. a distance of 1,600 ft. seven times a minute; also, that safety cages, used in mines, travel at the rate of 3,000 ft. a minute, and propelled by a single engine, are able to hoist 1,200 tons of ore a distance of 1,500 ft. in one day.

Engineering Inventions.—Messrs. William H. Bomgardner and Henry Kerns, of Omaha, Neb., have patented a system of car braking by which the brakes are set instantaneously by diminishing the speed of the engine, and by which they can be released by increasing the speed of the engine, the object being to set the brakes automatically whenever the moving or standing train receives a shock from either end, the system being so arranged as not to interfere with hand braking as commonly applied.

Blowing up Icebergs.—A New York paper suggests a new occupation for the numerous steam pleasure yachts in the Atlantic waters. It is proposed that they cruise in the region of the Newfoundland banks, and when icebergs are discovered, send off a boat's crew, which shall drill deep holes in the dangerous monsters, in which shall be placed heavy cartridges of dynamite, which shall blow them to pieces, thus making ocean voyages much safer.

Sebastopol Works Burned.—On the 27th inst., the works, machinery, and 100 cords of wood of the Sebastopol mine, Grass Valley, were destroyed, and also the shaft for quite a distance down. The hands were all at dinner except four men, who were down the shaft, but the latter escaped through the drain tunnel. The total loss is $12,000; insured for $2,500 each, in the Home Mutual and the California, both home companies.

Useful Information.

Oil in Exhaust Steam.—At the recent meeting of the American association of Mechanical Engineers, Mr. Hartwell read a paper upon "A condenser and apparatus for purifying exhaust steam for oil." The principle for operation is to take the exhaust into a chamber of many times greater area than that of the exhaust pipe. The exhaust enters from above and the tendency of any particles of oil in the steam is to continue their course until they strike on a bed of stone chips confined in place by a wire screen. The steam meantime turns at right angles and slowly passes onward through several screens of wire gauze. Its motion, however, is slow, as the chamber is from 12 to 50 times as large in section as the exhaust pipe. In this chamber a proper grease overflow is provided. The grease has a great tendency to adhere to any solid bodies in its course, and by means of the screens and body of stone chips the oil is taken from the steam, leaving the latter free to rise upward and enter the condenser, which is placed directly over the oil trap. This is arranged so as to heat the water nearly to the boiling point, but without back pressure upon the engine.

Interesting and Valuable, if True.—Alfred Dumesnil, a son-in-law of Julee Michelet, and the editor of the first of Edgar Quinet's works, claims to have made an interesting and useful discovery—how to preserve plants in a perfectly vigorous state without any earth. Since November, 1880, the date at which his researches proved successful, he has continually been taking plants from the ground in France and applying his process to them; has never found the least interruption in their vegetative functions; on the contrary, winter and spring plants have blossomed with a vigor which, as an experienced horticulturist, he has never seen in his garden. With the shelter of a glass, hellebores taken up at the end of November and the middle of December, have remained from 2½ to 3 months in blossom. Other plants, primroses, daises, violets, auriculas, etc., have not only been in bloom for three months, but have thrown out new buds. Bulbous roots, small shrubs, exotic plants, such as azaleas and cyclamens, take equally well to the process.

Moth Preventive.—A correspondent of the *Furniture Gazette* recommends the following remedy for exterminating moths in carpets and furniture: After some years of experience with the troublesome pests, says the writer, I found a sure preventive of moths in pitch paper, the same as roofers use. The moth will live and grow on cayenne pepper and tobacco, while I never could see that the use of these articles kept the moth miller out. The plan for the furniture dealer or housewife is to cut the paper in slips and place about the room, under and behind sofas, chairs, etc.; this should be done as early as the middle of April, and in warm climates earlier. If the dealer wishes to make parlor suits moth proof, he should place on the inside of backs of chairs and seats, small strips of pitch paper, and rest assured that the miller will not select these places to deposit eggs. It is the miller that is the foundation of all the mischief.

Compressed Gunpowder.—Some interesting experiments with Messrs. France & Baker's compressed gunpowder have been made at Messrs. Pease's mines, in Skinningrove, Cleveland. The powder, says the London *Mining Journal*, which was Curtis & Harvey's, had been compressed into a triangular form, so as to fit the drill-hole, and cut in short lengths, some weighing 2 to 3 ozs. each. The holes were drilled in the same way as if they were about to be charged with loose powder, the triangular blocks were placed in and exploded in the ordinary manner, but more than the usual quantity of stone was brought away. In all, 11 holes were charged, requiring altogether 162¼ ozs. of the compressed powder, whereas with the powder loose it would have required, in the judgment of the miners themselves, no less than 267 ozs. This shows in powder alone a saving of just 40%, to say nothing of the advantage in charging and the diminution of danger.

Cement for Joints.—When rubber plates and rings are used for making connections between steam and other pipes, leakage of joints may be prevented by using a cement made by dissolving shellac in ammonia. The pulverized gum-shellac is soaked in ten times its weight of strong ammonia, when a slimy mass is obtained, which in three or four weeks will become liquid without the use of hot water. This fastens well both to the rubber and to the metal or wood, and becomes by volatilization of the ammonia, hard and impermeable to either gases or fluids.

Horsehide Belt Lacing.—A correspondent of the *American Machinist* describes a very durable belt lacing, which was made as follows: A dry, untanned horsehide was soaked in water until soft enough to cut, and then cut into strings. These were made soft and pliable for sewing by "sawing" them over a square-cornered iron. The belt was then sewed with the hair side inward the first time across, and outward on the finish, so that the hair took all the wear. After the string had dried it was as solid as any hooks, with the advantage that it could not unhook. It wore remarkably well and did not cut the belt holes.

To Upholstery Buyers.—Here is a practical hint to upholstery buyers. M. Chevruel is making known a new series of observations on the vision of colors. Any eye which has looked at red for a long time becomes blind to green, and is disposed to see everything red; a little while after, it becomes blind to red and sees everything green. It is for this reason that a buyer after examining a series of pieces of red cloth, finds the last less pleasing than the first. A seller would prevent this by placing before his customer some green cloth on which the buyer's eyes might occasionally rest.

Blacking Piano-Forte Keys.—A good black ink is as effectual as any stain to blacken the sharps of a piano. It is, perhaps, not generally known that, though made of ebony, these keys always require staining, as true ebony is rather brown than black, and full of a yellowish grain. Old keys are probably saturated with grease; they should therefore be treated with potash first.—*English Mechanic.*

White of Eggs as a Lubricant.—A Dresden man has made a good lubricant for shafts by mixing the whites of eggs with the finest graphite powder, until of the consistency of firm dough. This is kept in boiling water till the whole is coagulated. The mass is then reduced to powder.

A New Tinner's Tool.—A valuable machine for tinners has been invented by a Bristol, Tenn., gentleman. It is thought that it will supersede the square, circular shears and dies now used, which cost about $800, and that it can be run with great rapidity by foot power, as well as by steam. The inventor thinks the machine can be furnished, complete, for about $200. The model is on exhibition at Bristol, and attracts much attention among machinists and mechanics.

Steam Packing.—A new steam packing has been patented, which consists of a series of prismatic plates, the meeting faces of which are parallel with each other and the periphery of the rod, such plates encircling the rod and the joints between the meeting edges, or between such edges and periphery of the rod, being covered by the second series of plates overlapping the first.

Shingle Roofs.—Shingles are made more durable and less liable to ignite from sparks when subjected to the following treatment: Water, one gallon; chloride of zinc, one-half lb.; digest in this the wood for 48 hours, drain, and put into a solution of crude tungstate of soda one lb., water, one gallon (hot), for three hours; then dry.

Good Health.

A Barber on Baldness.

Speaking of the credulity of many people touching the efficacy of hair tonics, an intelligent French hair dresser says:

"Very often the hair falls out after sickness. In such cases it generally grows again without the aid of any hair tonic whatever; but when it falls out from natural causes it never grows again. The celebrated Dr. Bazin, who was formerly physician-in-chief of the St. Louis Hospital at Paris, and who is known throughout the world as the most learned specialist for affections of the skin, told me one day that there was nothing that could make the hair grow after the baldness had come on gradually. This I believe firmly, or, if there was anything of the kind, we would not see so many New York doctors with heads as completely destitute of hair as the backs of turtles.

"I don't think I am far from the truth when I say that during the past 25 years that I have practiced the profession of hair dresser, I have made the trial upon different bald heads of more than 500 different hair tonics, and I am bound to admit that I never saw a single head, the hair of which was restored after baldness. At the end of so many failures, I am completely undeceived as to the value of all the preparations; and I would not now recommend any one of them, because I would be afraid to commit the crime that is designated by the words, 'obtaining money under false pretenses.' In my pathological studies upon the hair, I have found that people who perspire a great deal from the head are apt to get bald. The bad habit of wearing hats indoors is also very hurtful to the hair. In 1806, after the famous battle of Jena, in which the Prussians were completely defeated by Napoleon I, Baron Larrey, the celebrated military surgeon, perceived that many of the German prisoners were completely bald. Surprised, he made inquiries as to the cause of this, and he found that they owed their baldness to the shape—as homely as unhealthy—of their caps. The foul air of their head gear, having no issue, destroyed the vitality of the hair."

Toothache.—There should be a remedy for toothache in every house where there are children. The following is reported by medical authority as reliable: Take of carbolic acid (saturated solution), chloral hydrate (saturated solution), paregoric, fluid extract of aconite—of each one ounce; oil of peppermint, half an ounce; saturate a piece of cotton and pack tightly in the cavity.

Man and his Food.—Of course, various conditions of life, climate and locality, have to do with the quantity of food. Thus, an idle person can get along very well with two and three-quarter ounces of nitrogenous food and 20 ounces of carbonaceous food (flesh and cereal or vegetable food), when, if the same individual were walking or in active out-door life, double this quantity might be used. Perhaps the Esquimaux represent the heaviest feeders in the world, for Parry tells of a young native who devoured in 24 hours 9½lbs of sea-horse—half raw, half cooked—1¾lbs of ship-bread, 1½ pints of water, not counting grog and spirits. Both Sir John Ross and Dr. Hayes, from personal observations, declare that the daily ration of an Esquimaux may range from 12lbs to 20lbs of flesh food. On the other hand, it is quite remarkable how small a quantity of food a man may eat and still retain his health, though, as to the point of mental vigor engendered by scanty fare, that is another question. Cornaro, who wrote a treatise on long life, subsisted for 58 years on 12 ounces of vegetable matter, and 14 ounces of wine per diem, while another case is cited of a man existing for not quite 20 years on 16 ounces of flour per diem, made into some kind of pudding.

Effect of the Electric Light on the Eyes.—The evil effects of the electric light upon the eyes is said to be due to its constant variations of intensity, which give rise to sudden and frequent changes in the pupil, and, consequently, in the "accommodation" of the eye, by which is meant that alternate contraction and dilation of the pupil, by which it suits itself to the variations of light. Such a light, therefore, causes not only muscular fatigue, but also a considerable degree of blurring and indistinctness in the retinal image. The eye suffers both when the light is too dim and when it is too bright. In the former case the object must be brought close to be clearly seen, and an increased accommodative effort is called for, which, in most cases, results in nearsightedness. In the latter case, the simple intensity of the light produces undue contraction of the pupil, and an increase of tension within the eye. This objection has much more weight where carbon electrodes are used, than where the illumination is produced from the incandescence of some intercepting body like platinum or Edison's incandescent carbons.

Treatment of Burns Caused by Sulphuric Acid.—The *Journal de Pharmacie et de Chimie* says that two pupils of the Commonal school of Clermont-Ferrand, were severely burnt in the face while holding sulphuric acid, owing to the rupture of a retort. The author covered their faces with a soft paste made of calcined magnesia and water, and applied in layers of two mm. in thickness. As portions of the coating slipped off, the paste was re-applied. All pain ceased in about a quarter of an hour, and after some time—5 hours in the slighter of the cases, and 24 in the more severe—no further treatment was needful. Their faces show no trace of injury.

A Heroic Remedy for Baldness.—In cases of confirmed baldness the new remedy proposed is to remove the scalp, bit by bit, and substitute, by skin grafting, pieces of healthy scalp, taken from the heads of young persons. The success which has hitherto attended operations of this nature in cases of scalp wounds, gives a promising outlook for this new mode of curing baldness; and perhaps the day is not far distant when the shining pates of our venerable fathers will bloom with the flowing locks of youth.

A Medicated Pillow has been devised, containing receptacles filled with inhalent mixtures suited to different cases, as of headache, bronchitis, catarrh, etc., the fumes of which may be breathed at night, and for which much is claimed.

Peculiar Remedies.—Some of the remedies adopted by modern medical science are peculiar. Fuchsine—a bright, analine dye—was, not long since, recommended in Bright's disease, and now the use of nitro-glycerine, in minute doses, is advised for certain chest affections.

According to the National Board of Health, Vallejo, Cal., is the healthiest city in the United States, and Norfolk, Va., the unhealthiest.

Large Yields from Mines.—The Homestake mine, located in the Black Hills, Dakota, has paid from January, 1878, to September, 1880, $600,000 in dividends; but the Longstreet Mill and Mining Co., of Tombstone, owning the Toughnut group of mines, has paid out in nine months, $450,000 in dividends; and the Western Mining Co., owning the Contention mine, has paid out since July, 1880, the sum of $600,000 in dividends. That is, the Contention has paid out, in dividends, in seven months, the same amount that the Homestake paid out in two years and eight months; so that the showing is very much in favor of the Tombstone district over the one where the Homestake is located. Everything, too, is more favorable for this locality. The climate is finer, no snow storms block up the roads for a third or half the year, and lastly it is only 25 miles from the Southern Pacific, and will soon be in direct railroad communication with it, and so with both San Francisco and the East.—*Tombstone Epitaph.*

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Passing Events.

To mining men here, probably the event of the week has been the levying of the first assessment on California stock, after it has paid thirty-four dividends. The mine has produced a total of $46,734,831.44 in bullion and paid $31,320,300 in dividends. There is still in the upper levels of the mine a good deal of ore of low grade that would pay for working, but it cannot be taken out at present on account of the gas in those parts of the mine.

The eyes of mining men will soon be turned to the Yellow Jacket, now that active exploring operations have been resumed. They are going for the vein on the 3000 level with a drift, and on the 2800 are making explorations with the diamond drill. The Comstock ought to show us a bonanza again soon.

The country and the world has been appalled by the attack of an assassin upon the life of the President of the United States. Lying in wait for Mr. Garfield the wretched miscreant, Chas. Guitteau, fired upon him in the waiting room of the Washington railway station on Saturday morning. The bullet, fired from behind the President, penetrated his back, pierced his liver and lodged near the skin in front having penetrated his body. For days the President has tarried between life and death and the country has held its breath hoping to catch assurance that he would live and not die. From end to end of the nation there is but one desire, and that is a longing, deep and prayerful, that the people should not be robbed, by a wretch's freak, of its chosen chief magistrate, who has entered upon his course with such determination and manliness, and bids fair to serve the country well by his stand against political evils which are so generally condemned.

Assaying Gold Mill Tailings.

After a gold mill has been running for some time on uniform ore, it is generally pretty well known what the percentage of loss is; but at the same time it is just as well to keep the work checked, not only to prevent carelessness, but to know how the ore, which will always vary more or less, is going.

It is generally of more importance to determine the amount of gold in the tailings than to ascertain by assay the actual product of the original ore; since the quantity yielded by amalgamation on a large scale, added to that present in the resulting sands and stones, will, for many practical purposes, sufficiently represent the total contents of the rock.

It is also desirable to know exactly the amount of gold carried off in the final tailings, in order not only to be enabled to judge of any effect of any modification in machinery or methods, but also, as we have said, as a means of checking results.

When required for this purpose the tailings are caught at regular intervals throughout the day by placing a bucket or some other convenient vessel under the spout from which they will finally make their escape; and when full of water and sand it is placed aside in order to give the matter in suspension time to settle. As soon as the water in the bucket has deposited the whole of the solid matter which is held in suspension, it is carefully drained off, and the deposit, accumulated at the bottom, removed into a box prepared for that purpose.

This is repeated at intevals of about two hours, and at the termination of the experiment, the contents of the box are dried thoroughly and submitted to assay. In the case of samples of tailings thus obtained, the discrepancies between the several assays will, as a rule, have been retained by the blankets and other appliances over which the pulp has passed, and the remaining fine gold is disseminated with a considerable degree of regularity through the mass.

The Indian Gold Mines.

We have before this noted the fact that a number of companies had been organized in London to work certain gold mines in India. Although nearly a year has passed since the formation of these companies, it is only now that some of the results have been made apparent. One of the companies has brought some gold to London, taken from quartz they found lying at the surface of the mine. This result was due to the circumstance that the company, in taking the property, also secured some antiquated machinery manufactured on the spot, which, however, has proved useless for modern requirements. It was sufficiently good, however, to make a preparatory trial, and accordingly 44 tons were passed through the stamps, the result being a yield of 1¼ ounces to the ton; 25% more would have been saved, but for the defective appliances used for its treatment, but enough remained not merely to produce the specimens exhibited, but to encourage the company to proceed with vigor with the erection of their machinery and the development of their mines.

The two bars which arrived at Southampton, weigh 40 ounces, and would realize between £3 15s. and £4 per ounce. It appears to be gold of a very good character, and free from impurities, somewhat darker in color than that in the Australian sovereigns. A larger quantity of quartz would have been treated, but the machinery, as might have been expected, broke down. The new machinery includes 20 stamps, which will treat some 30 tons a day. This news will be of interest to all the shareholders in Indian gold mines, and will come as a relief to them. If 1½ ounces per ton can be realized with machinery of primitive description, and from the surface refuse of the former workers, it is only reasonable to suppose that appliances of the latest description, and quartz taken from the deeper workings, will produce a result far more satisfactory.

Stove Amalgamation.

In some of the colder and more humid districts of Mexico, a modification of the patio process has been employed. The ground ore instead of being exposed in the open air, or a paved court-yard, as in the ordinary patio process, is placed under a shed, and the usual method of patio amalgamation proceeded with, until the operation is about half completed. The ore is then removed into a sort of room termed an *estufa*, or stove, which has under it a fire-place, six or eight feet long, so connected by the side flues with small chimneys as to elevate the temperature of the room containing the ore. Then it is exposed to a gentle heat and allowed to remain during two or three days, when it is again removed and the reduction completed by the ordinary method of patio amalgamation. By this process the time required for the reduction of the ore is less than by the patio, and the yield of silver greater; the loss of mercury, on the other hand, is more considerable.

Working Silver Ore with Lead.

The magnificant machinery with which we now equip our silver mines was not always considered an essential. Perhaps the Mexicans set us pretty good examples in this respect. Their metallurgical appliances were very simple, some of it extremely rude. Probably the most primitive apparatus employed in any country of the extraction, by the dry way, of silver from its ores, was the trufla, a Mexican furnace, which was in principle merely a scorifier, in which the cupellation of the remaining lead is subsequently effected.

The sulphides of silver sometimes occur in so large a proportion, with regard to the gangue with which they are associated, that if finely ground and thrown in a bath of metallic lead kept at a proper temperature, the silver combines with the lead, which, becoming partially oxidized, unites with the silicious and earthy impurities of the slag, which may be readily removed from the surface of the metal before commencing cupellation.

This apparatus, which is much used by the native miners of Somhrerete, consists of a cupel formed of a mixture of ashes and clay, contained in a large coarse earthen dish, enclosed between walls of sun-dried bricks and covered by a dome of somewhat refractory clay, in which numerous holes are pierced.

The whole of the interior of this arrangement is filled with charcoal, on which a blast is thrown by means of a nozzle of baked clay; and although the whole of the heat is applied from above the surface of the lead, it quickly melts, and the scorification of the ore, thrown on the surface, begins.

When the workman considers that the bath of lead has, by the introduction of successive additions of ore, become sufficiently charged with silver, he cleans off the silicious slags, and commences the cupellation of the residual lead. For this purpose he makes an opening at the level of the metallic hall, for the escape of litharge, and continues the operation, at the same time gradually lowering the level of the exit for litharge, until a button of silver alone remains on the bottom of the cupel.

Precipitants for Gold.

In the leaching of gold and silver ores, when the ore contains copper, the waste solution from the tanks in which the copper is precipitated can be used for refilling the vat containing the precipitant for gold, as it contains a large quantity of iron proto-salte, chloride and sulphate. Mr. C. H. Aaron says that the strength must be reinforced with copperas, or acid and iron. The waste liquor from the chlorine generator, consisting partly of manganese proto-sulphate, is also a good precipitant for gold. In order to utilize as much as possible of the chlorine which it contains, as well as any free acid which may be present, it should be placed in a covered tub, or small vat, with some scrap iron. In a day or two the chlorine and the acid will be saturated with iron, thus forming an additional quantity of precipitant.

Other precipitants which yield the gold in the metallic state are, oxalic acid, sulphurous acid, the antimony, arsenic, and copper lower chlorides, and animal charcoal. The latter is used as a filter on which the gold solution is poured, when the particles of carbon become covered with a film of gold. It is patented. In some European works the gold is, or was, thrown down as a sulphide, by means of hydrogen sulphide. This method has the disadvantage of precipitating also copper, and some other metals, if present.

The Powder Explosion.

It will be recollected that on the 27th ult. an explosion occurred in a powder magazine at Tucson, Arizona. The dispatches from there at the time led most people to believe that it was only Tonite powder that blew up. Late advices by mail, however, show that there were seven different varieties of explosives in the building. The warehouse was divided into ten apartments, in one of which was stored a large lot of Giant powder caps and detonators. On the other side of the partition were the different powders, consisting of 17,250 lbs. of Hercules, 12,000 lbs. of Vulcan, 8,500 lbs. of Tonite, 400 lbs. of Giant, 275 lbs. of black powder and 20 lbs. of Dupont sporting. There were, therefore, 30,000 lbs. of nitro-glycerine powders and 8,500 lbs. of Tonite. The superintendent of the Tonite company, who gives us these facts, after having the matter investigated, says that the magazine was built of adobe 18 inches thick, with a partition, also of adobe, 18 inches thick, and the whole covered with a mud roof. Of course it is impossible to know what the cause of the explosion really was, where so many various explosives were in the same room.

THE mountains between Eureka and Palisade, Nev., are almost denuded of the timber that formerly covered them. For years the line of the Eureka and Palisade railroad has been the main source of the wood and coal supply for Eureka consumption. The industry has seen its best days in that direction.

Diatoms.

[Written for the PRESS by HENRY O. HANKS, State Mineralogist.]

A diatom is generally admitted to be a single-celled plant, bearing a singular relation to the animal and even to the mineral kingdom, being considered by some to belong partly to the latter, and regarded as a vegetable crystal, differing only from minerals in having the power of locomotion and of multiplying by separation. Kutzing says: "In comparing the argument which indicats the vegetable nature of the diatomaceæ with those which favor their animal nature, we are, of necessity, led to the latter opinion."

In connection with the idea that the diatoms pertain somewhat to the mineral as well as the animal kingdom, it is a curious fact that silica, deposited from fluoride of silicon, if crushed between plates of glass, and examined microscopically, with a medium power, markings may be seen on the outer surfaces of the vesiclee which resemble those of the diatome, especially pleurosigma and cosoinodiscus. It is also remarkable that Dr. James Blake collected 50 species of living diatoms from a hot spring in Pueblo valley, Nevada, the temperature of which was 163 F. Flint probably originates from diatoms, as does also the silica in certain rocks.

The name *diatom* is derived from a Greek word signifying *being cut in two*. Diatoms resemble the desmids, but differ in having an outer skeleton, or frustrule of silica. The frustrule of a diatom is a silicious box, always in two parts, one slipping over the other like a pill box or with edges opposed.

The thickness of a single diatom is, roughly, the sixth that of a human hair, and its weight is estimated at the 187-millionth part of a grain. Some varieties attach themselves to other bodies as the algæ, while others swim in the water free.

The study of the diatomaceæ aside from their scientific interest is very fascinating. Their extreme and varied beauty is a source of constant pleasure to the microscopist, and the question is often asked, why is so much beauty veiled from human sight?

The Beauty of the Diatoms

Consists in their color, their general form, and sculpture, or natural markings, which characterize nearly all of them. These delicate markings are seen under the microscope to be processes, knobs, bosses, concavities, ribs, groovings and lines, so minute that the highest powers made by the most skillful opticians are required to see them at all; even then, they can only be seen when the apparatus is manipulated by the most skillful operators. The lines of certain diatoms have been measured and are used to test the magnifying and penetrating power of object glasses. A slide called a test plate, has been prepared on which 20 well-known species are mounted, commencing with one on which the lines are comparatively coarse, and ending with one—*amphipleura pellucida*—which has 130,000 lines to the linear inch. For the convenience of study, typical diatoms are mounted on a single glass slide, so arranged that reference can be made to a printed catalogue for the names, while in some cases the names of the species are micro-photographed on the slide.

The diatoms are placed on the plate by the aid of an ingenious device called a *mechanical finger*, by means of which the shells can be picked up singly and given the desired position. *Moller's typen platte No. 1* has twenty-four lines in each of four groups comprising about 500 individuals of 395 distinct species and seventeen genera. The cost, with printed catalogue, is forty dollars.

Some microscopists are so fond of the study of these minute forms, that they scarcely do any other work than to observe, collect, classify and describe them.

When it is stated that the names of more than 4,000 distinct species of diatoms are given in a catalogue published by Frederic Habirshaw, of New York, each of which has some feature by which it may be distinguished, that this vast kingdom, so to speak, is invisible to the human eye, or nearly so, that when highly magnified many of the species are extremely beautiful, and all of them interesting, it is easy to understand why so much interest is taken in them the wide world over, and why every new discovery is heralded, and calls for samples come from the whole scientific world.

It is an established fact, strange as it may seem, that some of the greatest mountain chains, such as the Andes, and the very soil beneath our feet is chiefly composed of the

Remains of Animalcules,

Invisible to the eye, that is to say, the matter has been used by animated beings and returned again to the mineral kingdom, retaining the form which it assumed while a part of their minute bodies. Byron has written with more truth than he probably realized that "The dust we tread upon was once alive," and the remark of Dr. Buckland is often quoted "The remains of these minute animals have added more to the mass of minerals which compose the exterior crust of the globe than the bones of the elephants, hippopotami and whales."

In the tertiary age beds of diatomaceons or infusorial earth were deposited, consisting al-

most wholy of these microscopic organisms. The extent of somo of these deposits is almost incredible, and is regarded as an evidence of the great age of the world.

The Bohemian deposit in Europe is 14 ft. thick and, by the estimation of Ehrenburg, contains 40,000 000,000 diatoms to the cubic inch.

Darwin observed in Patagonia, along the coast for hundreds of miles in extent, a bed of tertiary sedimentary formation 800 ft. in thickness, overlaid by a stratum of diatomaceous earth. At Bilin, in Austria, a bed of infusorial earth, 14 ft. thick, occurs. One merchant sells annually many hundred tons of it. The *Bergh mehl*, or mountain meal of Lapland and Norway, is from beds 30 ft. in thickness. It must be remembered that these deposits extend over many thousands of square miles. Notwithstanding the astonishing fact that vast areas of the earth's surface is built of these minute forms, the true nature of these deposits was not known until 1837, when Ehrenburg published his celebrated work on that subject. The same deposition is taking place at the present time. In certain lakes in the United States and elsewhere, deposits several inches in thickness accumulate, composed wholly of the remains of recent diatoms. When thoroughly dried, a chalky powder is obtained, which, under the microscope, is easily recognized. Similar deposits have been made known by dredging the bottom of the sea.

According to Prof. Joseph LeConte: In the deeper parts of Lake Tahoe which sediments do not reach, the ooze is composed wholly of diatome or infusorial shells.

Dusty showers of a grayish or red color, are not unfrequent on the Atlantic and Indian oceans near the coast of Africa. Ehrenburg examined this dust and found it to consist largely of diatoms. He estimated the quantity let fall during a dust shower in the year 1846, near Lyons, at 720,000 lbs., one-eighth of which was diatomaceous, or 90,000 lbs., equal to 45 tons. Diatomaceous earth may be distinguished from other formations of a similar appearance by its insolubility in acids, extreme lightness, power of absorbing liquids and property of polishing metals. It is instantly recognized under the microscope in the hands of one who is familiar with its use. Diatomaceous earth has its uses as well as its scientific interest. It is largely consumed as a polishing powder, under the name of tripoli, from the locality which first gave it to commerce. It is known in California by the absurd name of *electro-silicon*, and at the East by a variety of trade names. It is a very convenient source of soluble silica, employed in the manufacture of silicate of soda or potash, also known as soluble glass. The manufacture of this compound is simplicity itself. Carbonate of soda or potash, as the case may be, is dissolved in boiling water to saturation, in a capacious iron kettle, and fresh hydrate of lime added until all the carbonic acid is precipitated, and the alkali becomes caustic. Diatomaceous earth in a powdered state is then added as long as silica is dissolved, and the whole covered and allowed to cool. When the insoluble matters have settled, the clear liquid is drawn off and evaporated in a clean vessel to the required density.

Diatomaceous earth is also used in the manufacture of porcelain, and it is a constituent of certain cements and artificial stones. At one time it was claimed to be a fertilizer, but this is thought to be a fallacy, although Ehrenburg states that the fertilizing power of the Nile mud is furnished by fossil infusoria.

Slabs of diatomaceous earth absorb liquids with avidity, and are used in laboratories for drying crystals and filters. This property might be more generally utilized if better known.

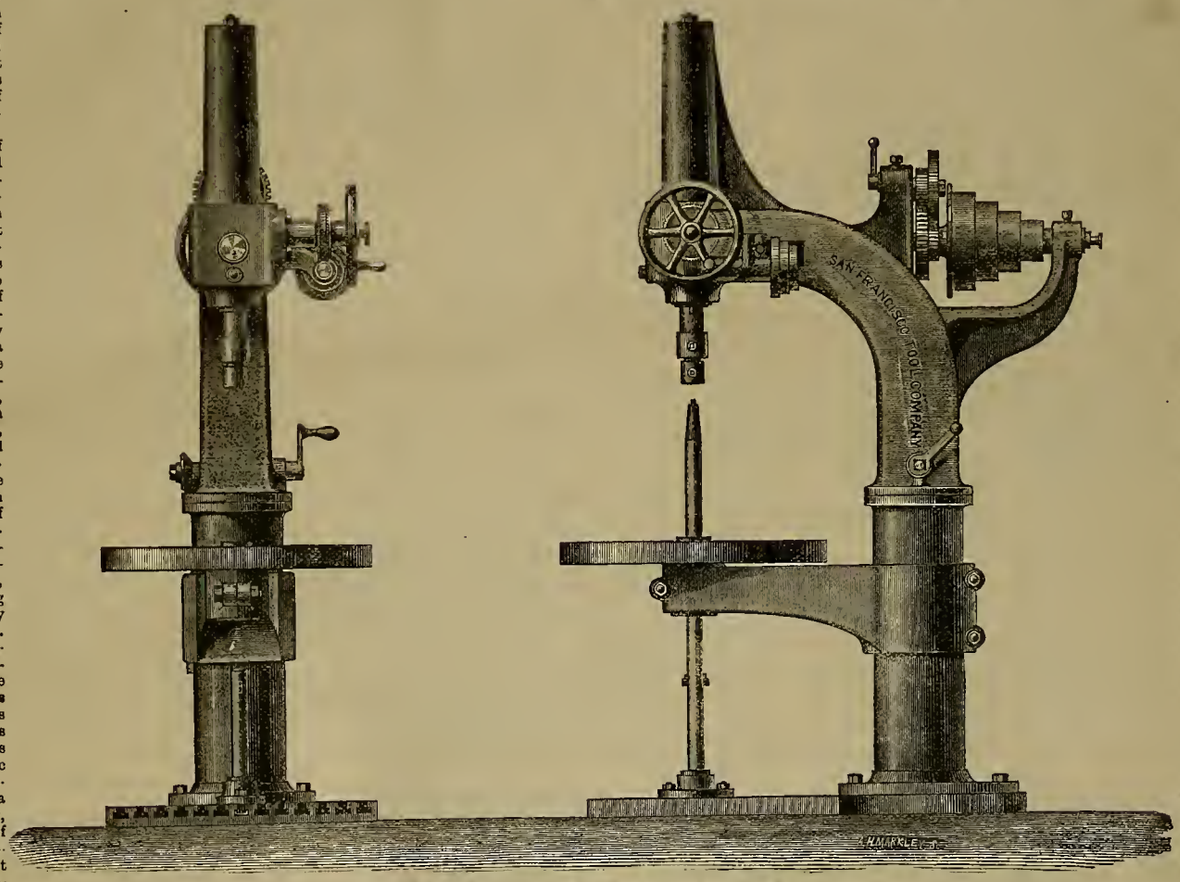
A convenient contrivance for lighting fires is a lump of diatomaceous earth with a handle of stout iron wire. It is dipped into a vessel of petroleum, placed in the stove or fire-place and lighted with a match. It continues to burn safely for some time. It can be used again and again. No person however should make use of it who has not the common sense to carefully set away the vessel containing the coal oil before lighting the match.

Bricks that float in water are made of diatomaceous earth mixed with one-twentieth part of clay and well burned. The art of making these floating bricks was well known in the time of Pliny, but was afterwards lost. It has recently been re-discovered. In the Italian department of Paris exposition of 1878, these bricks were exhibited, which attracted considerable attention. Floating bricks, made wholly of California material may be seen in the State Mussum.

Keiselghur or *"Flint Froth"* of the Germans, from a deposit in Hanover, is extensively used in the manufacture of dynamits, giant powder, lithofracteur, and other explosives. Diatomaceous earth absorbs from three to four times its weight of nitro-glycerine, with the advantage over other absorbents, of retaining the nitroglycerine under greater pressure. Dynamite contains 27%, and lithofracteur 23% of diatomaceous earth.

Before the keiselghur can be used, it is subjected to treatment to remove water, all organic matter and coarse particles. It is first calcined in a succession of furnaces, crushed between rollers, and sifted.

It is claimed that the diatomaceous earths of California are unfit for this purpose, but it is the opinion of the writer that they have not had a fair trial.



NEW DRILLING AND BORING MACHINE.

Diatomaceous earth is largely used in the manufacture of soap, to mechanically increase its detersive power. The Standard Company receive large quantities of it from the southern counties of the State.

It is not to be supposed that all the uses of this remarkable substance have been discovered; it remains for the intelligent inventor to search for new applications.

Diatomaceous Earths are Abundant in California.

Some of them being very interesting. The Monterey deposit has long been known to the scientific world. Dr. James Blake, who has made this subject a special study, thinks that all the California earths are of the miocene age.

The following is a list of the localities represented in the State Museum, samples of which (except the Santa Monica) will be furnished to specialists who make application for them. The numbers refer to the Museum catalogue:

35. Santa Monica, Los Angeles county.
175. Ione valley, Amador county.
240. Los Angelee county.
436. San Gregorio, San Mateo county.
444. San Joaquin valley, near San Carloe ranch.
547. Sea coast, 40 miles north of San Diego.
557. Staples' ranch, San Joaquin county.
654. Ten miles north of Petaluma, Sonoma county.
791. Santa Barbara.
830. Monterey county.
1184. Near Comanche, Calaveras county.
1246. Lost Spring ranch, Lake county.
1284. Santa Catalina island.
1331. Dutch Flat, Placer county.
1448. Port Harford, San Luis Obispo county.
1742. Fourteen miles below San Pedro, Los Angelee county.
1832. Eighteen miles southeast of Santa Rosa, Sonoma county.

Of all those mentioned above, the Santa Monica is the most noted. Slides of this material grace the cabinets of microscopists in all parts of the world, and yet the deposit from which it came is not known. The history of the specimen which furnished so much to science is interesting:

In March, 1876, Mr. Thomas B. Woodward, then connected with the United States Coast Survey, sent a fragment of diatomaceous earth to the California State Geological Society, which he found in tidal refuse on the sea shore, near Santa Monica, Los Angeles county. The piece could not have weighed more than two lbs., and had so long been subjected to the action of the waves that the edges and angles were rounded. The exact locality was two miles southeast of the lagoon, and several miles southeast of Santa Monica. He saw no other sign of a deposit of the earth. The genuine Santa Monica (which name refers to the waif) is now the most interesting of any known, and is prized above gold. Several attempts have been made to discover the origin of the fragment, but so far without success.

The following list of diatoms found in the Santa Monica will give some idea of its prolific character. The list is by no means complete, being only those identified by William J. Gray, M. D., of London, England; Charles Stoddard, of Boston, Mass.; J. H. Engeles, M. D., of Nevada City, Cal.; and Wm. Norris, of this city. The writer will be pleased to receive contributions to the catalogue from any diatomist who may see this article.

Diatome Found in the Santa Monica Earth.

1. Actinophænia splendens.
2. Actinoptychus superbus.
3. Actinocyclus interpunctatus.
4. Arachnoidiscus ornatus.
5. " Ehrenbergii.
6. Amphitetras elegans.
7. Amphitetras Wilkesii.
8. Asteroiampra varisbilis.
9. Asteromphalus Darwinii.
10. Auliscus elegans.
11. Auliscus mirabilis.
12. Auliscus notatus.
13. Auliscus pruinosus.
14. Auliscus racemosus.
15. Auliscus reticulatus.
16. Auliscus sculptus.
17. Auliscus Hardmanianus.
18. Aulacodiscus Browneii.
19. Aulacodiscus Kittonii.
20. Aulacodiscus margaritaceus.
21. Aulacodiscus Oregonensis.
22. Aulacodiscus pulcher.
23. Biddulphia aurita.
24. Biddulphia Johnsoniana.
25. Biddulphia Tuomeyii.
26. Campylodiscus.
27. Chatoceros.
28. Climacosphenia monilligera.
29. Cocconeis parmula.
30. Cocconeis punctatissima.
31. Cocconeis fimbriata.
32. Cocconeis scutellum.
33. Cocconeis splendida.
34. Cocconeis pseudomarginata.
35. Cocconeis Grevillii.
36. Coscinodiscus gigas.
37. Coscinodiscus concavus.
38. Coscinodiscus oculus-iridis.
39. Coscinodiscus subtilis.
40. Coscinodiscus robustus.
41. Cosmodiscus elegans.
42. Cresswellia rudis.
43. Dictyocha (?) varians.
44. Dityium.
45. Discoid forms—rare and very plenty.
46. Euodia gibba.
47. Eupodiscus oculatus.
48. Eupodiscus Rogersii.
49. Endyctia oceanica.
50. Gephyria constricta.
51. Gephyria gigantea.
52. Gephyria incurvata.
53. Gephyria Teifairie.
54. Grammatophora marina.
55. Grammatophora—unnamed large variety.
56. Grammatophora macilenta.
57. Grammatophora serpentina.
58. Goniothecum.
59. Glypodiscus stellatus—4, 5 and 9 processes.
60. Hyalodiscus Californicus.
61. Hemiaulus Californicus.
62. Hercotheca.
63. Heliopelta Leeuwenhockii.
64. Heliopelta Nitida.
65. Isthmia nervosa.
66. Melosira sol.
67. Navicula California.
68. Navicula excavata.
69. Navicula lyra.
70. Navicula nebulosa.
71. Navicula prætexta.
72. Navicula spectabilis.
73. Omphalopelta moronensis.
74. Omphalopelta versicolor.
75. Plagiogramma.
76. Pleurosigma.
77. Podosphenia.
78. Porpeia quadrata.
79. Porpeia ornata.
80. Rhabdonema Adriaticum.
81. Raphoneis.
82. Rutilaria epsilon.
83. Rutilaria obesa.
84. Stictodiscus Californicus.
85. Stictodiscus Hardmanianus.
86. Stictodiscus—new form.
87. Synedra—very large.
88. Stephanopyxis oblongus.
89. Stephanopyxis umbonatus.
90. Surirella.
91. Stauroneis aspera.
92. Triceratium arcticum.
93. Triceratium Monterey.1.
94. Triceratium parallelum.
95. Triceratium—unnamed.
95. Triceratium Wilkesii.
96. Triceratium—large variety of forms.
97. Triceratium, with 5 or 8 angles.
98. Xanthiopyxia—new.
99. Xanthiopyxia oblonga.
100 Xanthiopyxis umbonatus.

New Drilling and Boring Machine.

This week we illustrate another of the machine tools of the San Francisco Tool Company, a double geared drilling and boring machine. The drawing like former ones being in true elevation, conveys an exact idea of the machine, except the feeding gearing, a part of which is enclosed in the main frame.

The method of feeding down the spindles is a new and novel one of great simplicity, admitting ready adjustment, lubrication and removal. By removing two screws the main spindle screw sleeve, indeed, all but the friction feed clutches, can be removed from the machine.

The spindle has a hand movement from two to three times as rapid as is common, and can be raised or lowered almost as quick as by the detachable gearing now applied to same machines. The complicated details thus avoided are among the most perishable details, that have been added to meet a necessity caused by arranging the feed movement so slow that it becomes indispensable to disengage the gearing.

The old column drilling machines of 50 years ago have not been much improved upon. A coarse threaded sleeve and a heavy hand wheel around the spindle is quite as convenient and much more durable and cheap than most of the modern refinements for hand feed.

A new feature of the machine illustrated is that two kinds of feed are provided—a positive one for drilling large holes or in boring, and a yielding one for small drills. The feed motion engages by means of friction clutches, and the thrust upon the spindle can be regulated at pleasure, according to the amount of pressure applied on the clutch.

The various details shown in the engraving will all be understood without description.

The company make several modifications of drilling machines, some of which we hope to illustrate in some future numbers of the PRESS.

CARP IN LAKE.—Lake county will prove one of the best fish-producing districts in America. Schwartz & Webber, near Middletown, in Lake county, are doing well with carp. They have five ponds, the largest covering about one acre, stocked with an immense number of small fry. They are improving and increasing their ponds, and do not expect to rest until they have 14, embracing in all 8 to 10 acres of land. They have an abundant supply of water from a large trout stream (of 40 to 45 degrees in temperature), brought in by a ditch, and the flow regulated so as to keep the water in the ponds at about 80 degrees during the warm season. The fish are growing fast, and next season the guests at Anderson and Harbin springs—within two miles of the ponds—can be supplied with fine large fish, transported alive in tanks if desired. They have found the low, moist, black soil land more favorable for holding water in ponds than the higher red soil and gravel land—and believe Lake county as good as any in the State for fish culture. The proprietors of Anderson springs have taken water from the stream mentioned above, at a higher point, to supply a large pond made upon their former croquet grounds. Carp have also been placed in the very large pond at Boggs' old mill-site, between Glenbrook and Kelseyville.

THIRTY to 40,000 people witnessed the regatta on the Charles river, Mass. The three-mile race was won by Hosmer in 21:16. The double scull race, three miles, was won by Plaisted and Lee in 21:13. John Buckley, of Portland, won the three-mile race for amateurs,

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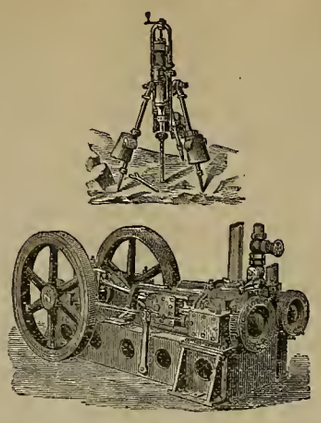

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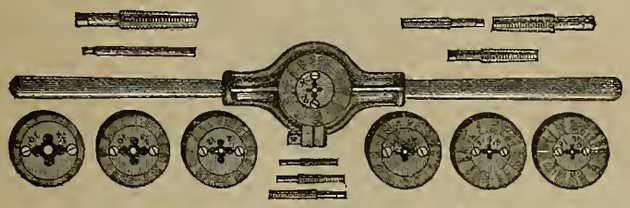

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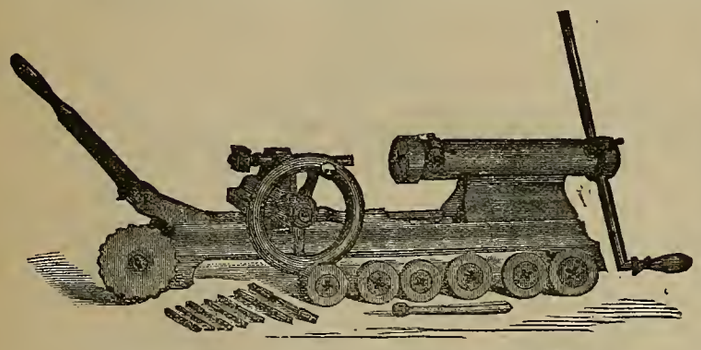

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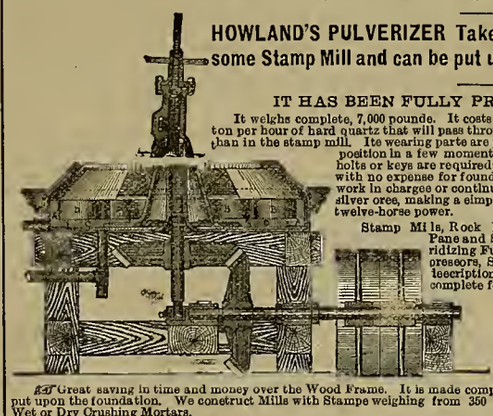

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Patents and Inventions.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.]

For the Week Ending June 28, 1881.

243,438.—Pump Valve—J. H. Dunlap, Turlock, Cal.
243,452.—Boots and Shoes—M. Leventritt, S. F.
243,453.—Boots and Shoes—M. Leventritt, S. F.
243,386.—Steam Boiler—J. F. McEntee, S. F.
243,401.—Ore Roasting Furnace—Jas. B. Randol, New Almaden, Cal.
243,402.—Ore Roasting Furnace—Jas. B. Randol, New Almaden, Cal.
243,403.—Ore Roasting Furnace—Jas. B. Randol, New Almaden, Cal.
243,462.—Vacuum Dredge—J. F. Saunders, Ogden, Utah.
243,644.—Shield for Cattle—John Stemmons, Eureka, Cal.
243,647.—Tire Upsetter.—A. A. Still, La Panza, Cal.
243,665.—Rivet—F. Ott, Cambria, Cal.
243,390.—Hydraulic Elevator—W. H. Milliken, S. F.

Note.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign, Patent Agency, the following are worthy of special mention:

Pump Valve.—J. H. Dunlap, Turlock, Stanislaus county, Cal. Dated June 28, 1881. No. 243-438. This invention relates to valves for pumps, and consists of a lower, elongated, cylinder, constituting the lower valve, punctured with holes to admit water freely, and moving its length within a plate, having an elevated valve seat, whereby a tight fit is effected, and an upper valve, consisting of a similar cylinder, having four oblong or elongated holes for the escape of the water, and moving up and down within appropriate casing, being limited by a cross pin or otherwise.

Highland Springs.

These springs are charmingly and fortunately situated among the sunny and airy high lands of Lake county, 27 miles northeasterly from Cloverdale (the nearest R. R. station), and eight miles south from Lakeport, the county town. Five hundred and twenty acres are embraced in the premises, which include a dairy, vegetables, stock, hay and grain farm. The springs were first brought to public notice about 12 years ago. At times, 100 to 200 boarders and campers have been quartered here. There are ample and finely shaded camping places. A pleasant grove adjoining the commodious hotel and cottages contains fine croquet grounds, lounging hammocks, and rural seats in shady nooks. The springs and a clear stream are close by. Warm, tepid and cold water baths, from natural and medicinal springs, are supplied free to boarders. A pouring stream and shower bath, of tepid, mineral water, is one of the most decidedly beneficial as well as enjoyable features of the bathing department.

We are aware of no more justly celebrated springs in California. Across the foot-bridge, which spans the creek a few steps from the hotel, is the "Magnesia spring." It has a large flow of tepid water, which, although slightly disagreeable to the taste, is decidedly agreeable to the health of many. A little further along is the "Magic spring," the water of which is slightly warm, but sufficiently impregnated with magnesia, soda, lime, iron and other ingredients, rendering it tolerably palatable. This is freely drank by visitors, especially before eating. It has made remarkable cures from rheumatism, kidney and nervous diseases, and there are many who will bear decided testimony to its wonderful restorative powers. It supplies a large flow of water for the "pouring" and other baths. The "Dutch" spring comes out of a rock a little further down the creek, about 50 rods from the hotel. This gives a small volume of cooler water, highly charged with iron, etc., with a slight after taste, resembling coal-oil. This is also a choice spring and the favorite of many. Most extensively patronized is the Soda spring, situated on the opposite side and more nearly in front of the hotel. Its water is almost universally popular with both pleasure and health seekers. It is also renowned for its curative qualities. Large quantities of it have been bottled and distributed far and near to those who, from time to time, have become acquainted with its restorative virtues and palatable taste. It holds its strength and flavor in a remarkable degree when transported, and ought, in time, to become a popular drink abroad. While it is necessary for persons to visit these springs in order to fairly realize the advantages of the place, it is pleasant for the writer to be able to say that the proprietress, Mrs. Astoria C. Goods, succeeds admirably in rendering to her numerous and worthy class of guests pleasant and homelike accommodations, in a degree affording general satisfaction to them and credit to herself.

"Highland" post-office, located in the hotel, is a real convenience. Mails arrive in 10 hours from San Francisco daily, via Cloverdale. Visitors by this route have 27 miles of staging over a grand and picturesque route. They can return via St. Helena mountains and Calistoga, if they desire further views of wonderful and delightful scenery in Lake and Napa counties.

The Cinchona Industry.

Now that we are in the midst of practical experiments with the cinchonas, and as the College of Agriculture has sent out a number of seedlings for test in different parts of the State, this interest in the subject of quinine production is a direct one to Californians. We see it stated that the Eastern interest in the subject is also growing, not with the hope that cinchonas can be grown at the East, but that our country should do something to ascertain whether some of the varied climates within our national borders cannot do something to augment the failing supply of the famous febrifuge. There was a bill introduced by Mr. Kelly, of Pennsylvania, at the last session of Congress, to start an inquiry and experiment under government auspices, into the practicability of cinchona growing. The bill was lost in the crush at the close of the session, but it may be expected to come up again and will probably receive vigorous support at the East, for there seems more disposition to look favorably upon tests for quinine than upon ventures in tea culture. We trust it may prevail, for with the evidence now in hand there is reason to believe that California should be thoroughly assayed for cinchona qualities.

Cinchona culture in general is progressing. The Philadelphia *Ledger*, drawing its information from foreign sources, says, some of the facts are already known to our readers, others are new. For 40 years England has been industriously engaged in establishing bark plantations in the upland regions of India and Ceylon, the West Indies and wherever it could be ventured on, and the Dutch have been equally busy and successful in Java. Now supplies from these sources are coming regularly to the markets in London and Amsterdam, and the prices got for these East India barks are proportionately higher because they yield a better percentage of quinine, due to the care in cultivation, selection and preparation. We trust this statement is true. It is made without qualification and the market rates is an infallible test for quality in a material of this kind. It has been feared that the quality of bark might suffer under cultivation and by change of condition, and if this fear can be laid aside it will be fortunate. The English authorities have published full reports of their long and varying series of experiments which finally led to the present success, and their scientific journals regularly report the results of analyses of the last importations.

The field for the production of quinine seems open and not likely to be covered by the enterprises now under way. It is said that some of the enterprising planters in Ceylon have gone ahead so boldly, and are so confident of their future, that they have made calculations for a supply that will soon meet the demand, but careful experts, such as Mr. Howard, the leading English manufacturer of quinine, and the other scientific men with whom he is associated in testing the various barks sent to London, rather discourage any such sanguine hopes, and hold the view that the demand is likely to outstrip their efforts. We trust that the matter may be followed up at the next session of Congress and that our representatives will fully inform themselves of the results which have already been attained here, for these will show the opportunity for more general efforts and the promise of success in them.

The Mining and Scientific Press.—This excellent paper of June 18th, comes to us this week, considerably enlarged, numbering 36 pages with numerous illustrations, including a map of Arizona Territory, which is valuable, more particularly at this time as public attention generally is attracted in that direction. The Mining and Scientific Press is one of the most useful papers published on the Pacific coast, and every man interested in mines should not be without so important a medium of information that would soon prove to him its usefulness. Dewey & Co. are well known to the Pacific coast and have probably done as much to advance the mining interests of California, Oregon and Nevada, as all other publishers combined. Subscription only $4 a year, and this number alone is worth that amount to anyone desiring information concerning Arizona, and other valuable matters of interest.—*Mariposa Gazette.*

Commendable Enterprise. — The public-spirited and energetic publishers of the Mining and Scientific Press, Dewey & Co., 202 Sansome St., San Francisco, have just issued an Arizona edition of their paper, 36 pages, replete with the most entertaining and instructive communications on this latest scientific topics of the present century, amongst which are — "The Brush Electric Light," "Contributions to the Geology of California," "The Old River Beds of the Sierra Nevada, of California," besides a large number of intelligently written articles about the rich and extensive mineral resources of Arizona, with an accurate map of that new El Dorado. Every miner that wishes to keep pace with the times, should be enrolled as a subscriber for this valuable scientific journal.—*Mountain Messenger.*

Industrial.

There has been no time since the exactions of the late war when good workmen were in such demand throughout the country as at present, and the business outlook in almost every branch of industry is most encouraging. The large present demand for shop nutbits furnishes good evidence of the general prosperity of our manufacturing interests. Orders in that line during the past year have been received from almost every quarter of the globe. Mexico, Russia, and even England have recognized the fact that our mechanics excel in machine tool work by sending orders for the same.

Wood working machinery is in special demand, and some of the manufacturers of that class of machinery are "crowded and overwhelmed with orders."

English and American Railway Cars.—English papers are beginning to speak more generally in favor of the American system of railroad car building, and well they may! To say nothing of the superiority of the general arrangement of our cars, it is well known that, as a general thing, the English railway carriage, when thrown from the rails, usually goes all to pieces, photographs of such wrecks showing that they commonly consist of a confused pile of panels and doors, with broken ironwork and shattered framing. A good American car, honestly built, can be thrown against a solid obstruction at a speed of 25 miles an hour without breaking up; and if it was not that the passengers are thrown about and brought in contact with seat backs and the hanging work on the ceiling and sides, an accident of this kind would rarely be attended with exceptionally serious consequences, whatever the speed. English companies are also adopting the American method of supporting long passenger cars on "hogis trucks."

The Fairbank's Scale Works of St. Johnsbury, Vt., are said to be making 30 tons of iron per day, and are still far behind their orders. Since 1880 came in they have averaged over one railroad track scale for each working day.

Copper Products.—The close of the year 1880 showed that the copper mines of Lake Superior, since their commencement, have produced 300,000 tons of ingot copper, valued at over $140,000,000.

Exports.—During the past five years the excess of exports in the United States over imports, has aggregated $900,000,000. Our imports from foreign countries have fallen in five years from $1,450,000,000 to $1,425,000,000, while our exports to Great Britain increased from $340,000,000 five years ago to $455,000,000 last year.

The Mississippi River Trade.—The geographical position of New Orleans is beginning to assert itself. It is now the second port of export in the country. Some idea of the growth of the grain movement from St. Louis to the seaboard at New Orleans in barges, may be gained from the fact that from January 1st to October 16th, of last year, the shipments were 13,914,000 bushels, as against 6,164,838 bushels for the corresponding period of the previous year. For April the total exports of New Orleans exceeded $11,000,000, the exports of Boston for that month being about $6,000,000. The Nashville *American* thinks that the entire Mississippi valley will eventually pour its immense trade into New Orleans.

News in Brief.

Earthquake at Hanford on the 3d.

There are only 45 prisoners in the Utah penitentiary.

The total acreage in vines in Napa county is about 12,000.

Santa Claus, the California horse, was defeated at Rochester on the 5th.

The army worm has just made its appearance at Lower Soda Springs, Shasta county.

A number of the retail butchers of this city have organized a Mutual Protective Union.

The opera house and 12 other buildings at San Jose, were destroyed by fire on the 4th.

There are 300 men in the woods at the head of the Yakima, W. T., getting out railroad ties.

The *World* says: There is no longer a doubt that the infant heir of the Duke of Norfolk is blind.

Chinamen are catching spring salmon on the Columbia river, near Clifton, Oregon, with hook and line.

The silver ledge recently discovered at Orcas Island, W. T., is creating considerable excitement.

From 200 to 250 tons of refined sulphur are shipped every month from the Humboldt Co.'s works, near Winnemucca, Nev.

France has determined to mobilize 100,000 troops and send them to Africa to put down the insurrection with a strong hand.

Hamilton Disston, the Philadelphia saw manufacturer, has bought 4,000,000 acres of land in Florida. It will be reclaimed and colonized.

The proposition to levy a special tax of $12,000, in Seattle, W. T., to build new school houses, was voted down by the people of that district.

By the 1st of August a full force will be put on at Carson and coining resumed. The mint has been accumulating bullion of late, and now has 300,000 ounces on hand—enough to justify resumption of active work.

The surveyors are at work in Sierra valley staking off the Plumas branch of the railroad which is to run through the valley. It is a branch of the Nevada and Oregon railroad, which runs from Reno north.

The Indians of the Swinomish Reservation, immediately opposite La Conner, W. T., have nearly completed a dyke by which over 600 acres of tide land will be reclaimed, at an expense to the government of $400.

The life-saving station at Bolinas bay, as to the buildings, nearly completed. It is situated on the beach at the foot of the street which runs through the town, and is expected to be fully manned and equipped by August 1st.

The Arabs of Sfax, Algeria, have driven out the Europeans and have occupied the forts. If the forts are not surrendered the French will bombard them. The Arabs have pillaged Sfax, and 3 persons were killed and 20 wounded.

Observations made lately at the Davidson Observatory show that the comet in the northern sky is rapidly speeding away from the vicinity of the earth. It no longer disappears below the horizon, but retains its position high in the northern heavens all night. The spectrum shows the same peculiarities of composition as formerly. In the morning skies Venus, Jupiter, Mars and Saturn still form a very brilliant galaxy, with Capella to the northward and the comet apparently flying from the Pole star.

The slipshod manner in which the boundary lines of the military reservation have been established in Arizona is working a hardship to many stock and ranch men, who through ignorance have been so unfortunate as to settle upon them. Col. Carr, commanding officer at Fort Lowell, recently served notices on all settlers upon the military reservation to move off at once. A similar order has just been issued by the commanding officer of Camp Huachuaca military reservation.

Our Agents.

Our Friends can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. F. Osborne—San Francisco.
A. C. Knox—Napa and Lake counties.
O. W. McGrew—Santa Clara county.
M. P. Owen—Santa Cruz county.
J. W. A. Wright—Merced, Tulare and Kern counties.
Jarvis C. Hoag—California.
B. W. Crowell—Yuba and Sutter counties.
D. W. Kelleher—Solano and Sacramento counties.
Geo. W. Fahrion—Plumas county.
Otto H. Hopkins—Amador county.
A. Leonard Meyer—Utah and Idaho Ter.

Important additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

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The State Mining Bureau, No. 313 Pine street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry O. Hanks, State Mineralogist.

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DIVIDEND NOTICE.

OFFICE OF THE

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SAN FRANCISCO, JULY 2, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 30), of Seventy-five (75) Cents per share was declared, payable on TUESDAY, July Twelfth (12), 1881, at the office in this city, or at the Farmer's Loan and Trust Company, in New York.

WILLIAM WILLIS, Sec'y.

Office—Room 20, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

Arizona Mexican Mining Company.—Lo-

cation of principal place of business, San Francisco, California. Location of works, Globe District, Arizo a

Notice is hereby given, that at a meeting of the Directors, held on the 7th day of June, 1881, an assessment (No. 1), of Fifty (50) Cents per share was levied upon the capital stock of the Corporation, payable immediately in U. S. Gold Coin, to the Secretary at the office of the Company, Room 33, No. 320 Sansome St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 15th day of July, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 8th day of August, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

GEO. R. ADAMS, Secretary.

Office—320 Sansome St., Room 39, San Francisco, Cal.

ANNUAL MEETING.

GOVER MILLING AND MINING COMPANY.—The regular Annual Meeting of the Stockholders, for the election of a Board of Directors, will be held on Tuesday, June the 14th, 1881, at 2 o'clock, P. M., at the office of the Company, No. 402 Front street, Room 8, San Francisco California. W. O. WILSON, Secretary.

Steep Hollow Gold Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Liberty Hill Mining District, Nevada County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 21st day of June, 1881, an assessmeot (No. 6), of $1.50 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the Company, No. 310 Pine street, Rooms 15 and 17, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of July, 1881, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 18th day of August, 1881, to pay the delinquent assessment together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. W. PEW, Secretary.

Office—310 Pine St., Rooms 15 and 17, San Francisco, Cal

DIVIDEND NOTICE.

San Francisco Savings Union,

532 California St., corner Webb.

For the half year ending with June 30, 1881, a dividend has been declared at the rate of five and one-tenth of one per cent (5 1-10) per annum on term deposits, and four and one-fourth of one per cent (4¼) per annum on ordinary deposits, free of Federal tax, payable on and after Wednesday, July 13th, 1881. LOVELL WHITE, Cashier.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending this date, the Board of Directors of The German Savings and Loan Society has declared a dividend on Term Deposits at the rate of five and one-tenth (5 1-10) per cent per annum, and on ordinary Deposits at the rate of four and one-fourth (4¼) per cent. per annum, free from Federal Taxes, and payable on and after the 11th day July, 1881. By order, GEO. LETTE, Secretary.

San Francisco, June 30, 1881.

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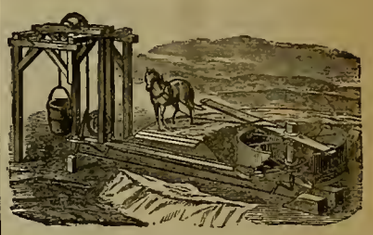

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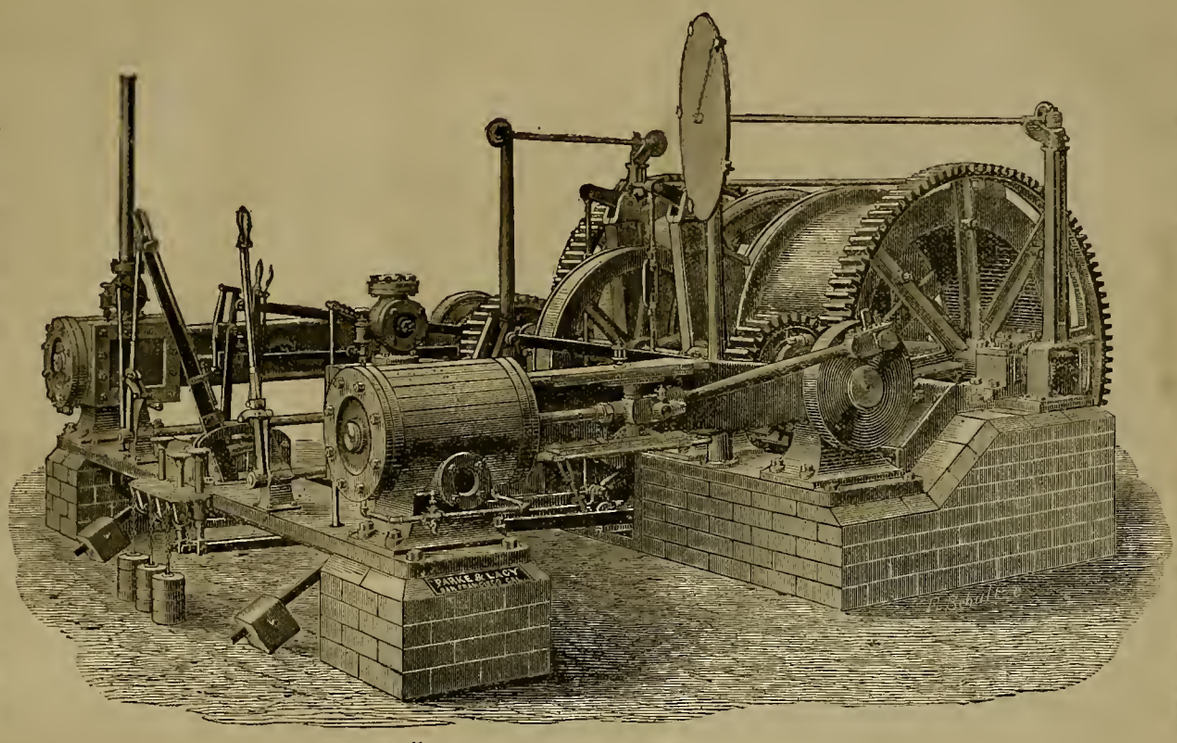

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Mining, Milling, Smelting and Concentration of Ores.
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Concentrating Machinery!

FOR CONCENTRATING

Gold, Silver, Lead and Copper Ores.

Furnaces for Roasting and Chloridizing Ores, for Amalgamation or Leaching.
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FOR SINGLE OR DOUBLE SHAFTS, TO WORK TO ANY DEPTH, OF LATE AND IMPROVED DESIGNS, SUPERIOR TO ANY OTHER MAKE; ADAPTED TO THE REQUIREMENTS OF PRACTICAL WORK AND EMBRACING ALL THE IMPROVEMENTS AND SAFEGUARDS THAT EXPERIENCE HAS PROVED VALUABLE IN THIS CLASS OF MACHINERY. MINING CAGES, CAR AND BUCKETS, ALSO MILL AND MINING MACHINERY OF EVERY DESCRIPTION. SEND FOR CIRCULAR. RANKIN, BRAYTON & CO., PACIFIC IRON WORKS, SAN FRANCISCO, CAL.

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This Hotel, under the management of CHAS. MONTGOMERY, has been thoroughly renovated, and being in the very center of all the Banks, Insurance Offices and Commission Merchants, it offers special inducements to Merchants from the Interior and Farmers.

Board, with Room, $1, $1.25 and $1.50 per day. Special rates by the week or month.

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Plastic Cement and Hair Felt, with or without the Patent "AIR SPACE" Method. Cement ready for use by the barrel.

G. C. FOWLER, No. 413 Pacific St., S. F.

"THE $1,000 CHALLENGE"

Ore Feeder for Quartz Mills.

OVER 800 ARE NOW IN USE, GIVING ENTIRE SATISFACTION.

Awarded First Premium at the Tenth and Twelfth Industrial Fairs of the Mechanics' Institute.

Twenty Per Cent. More Ore Crushed with Fifteen Per Cent. Less Wear of Iron than by Hand Feeding.

The accompanying cut illustrates the recently lutroduced Grip, and also the Spring Attachment, which replaces the Weight herctofore used, and which are obvious improvements.

It is now fully demonstrated, after careful and long continued experimentation and practical use, that the plan upon which a perfect Ore Feeder must be constructed is that of a carrier, and not that of a shaking-table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Jerky or spasmodic c ontrivances will not answer the purpose for wet or sticky ores.

The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20	Stamp	Tuolumne	county,	Cal.
Sheep-Ranch	20	"	Calaveras	"	"
Mahoney	40	"	Amador	"	"
Zelle	40	"		"	"
Placerville	40	"	El Dorado	"	"
Gross	80	"		"	"
Julian	20	"	Placer	"	"
St. Patrick	15	"		"	"
Providence	20	"	Nevada	"	"
Omaha	10	"		"	"
Green Mountain	60	"	Plumas	"	"
Plumas-Eureka	60	"		"	"
Bulwer-Standard	30	"	Bodie Dis.,	Mono,	"
Standard	20	"		"	"
Noonday	30	"		"	"
Bodie	10	"		"	"
Christy	5	"	Uintah Co.,	Utah.	
Ontario	40	"	Parley's Park,	"	
Contention	20	"	Tombstone Dis,	Arizona	
Grand Central	20	"		"	
Harshaw	20	"	Patagonia,	"	
Sunshine	20	"	Idaho Springs,	Col	
Homestake	200	"	Black Hills,	Dakota.	
Father De Smet	80	"		"	"
Hidden Treasure	40	"		"	"

Superiority of the "Challenge" Ore Feeder Demonstrated!

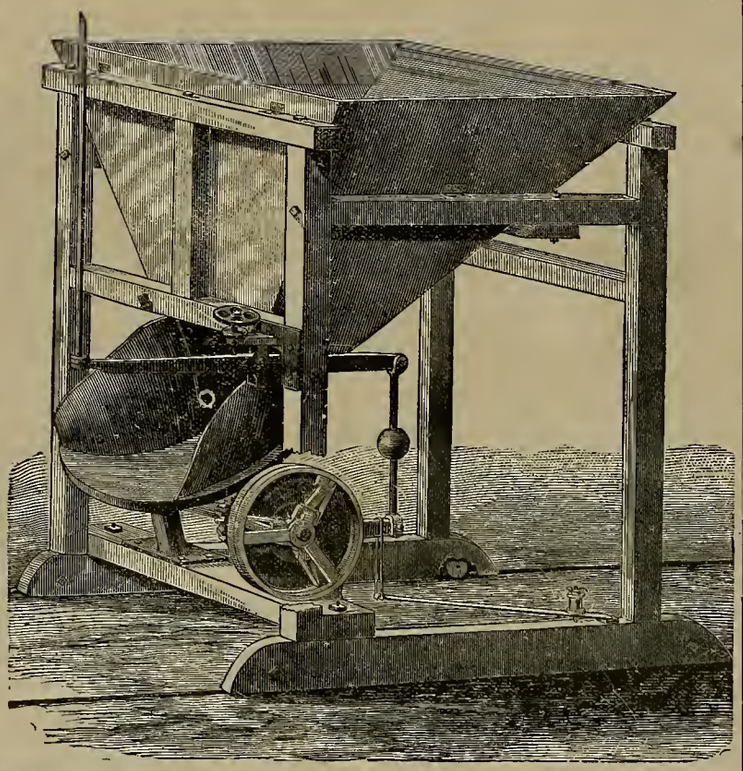
At the "Christy" Mill, Uintah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "Eclipse."

The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" eeders, but after a few weeks trial they were pronounced adequate to the work, discarded, and the "Challenge" dopted.

The "Silver King," Mill of Arizona, also removed the 'Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill, of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.



These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.

Mr. H. W. GREENWELL, of the Tingman Mine, El Dorado Co., or any other person can make $1,000 by disproving the acknowledged superiority of my "CHALLENGE" Feeder, in a competitive trial, side by side, with any other Feeder, on wet or sticky ores from any mine, and I will give $100 to any one who will procure the acceptance of this challenge, and arrange for a fair and impartial test on merit.

I mean business, Gentlemen, "either put up or shut up."

JOSHUA HENDY,

Manufacturer of all descriptions of Quartz and Saw Mill Machinery. A Large Stock of both New and Second Hand at Machine Works. Nos. 49 and 51 Fremont Street, San Francisco.

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MACHINE WORKS,

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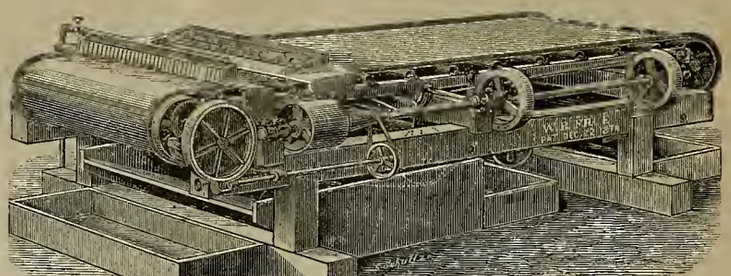
And 40 Franklin Street.

ST. LOUIS, MISSOURI,
No. 209 North Third Street.

ST. LOUIS, MISSOURI,
Nos. 811 to 819 North Second Street.

$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR.

Over 250 are now in use, giving entire satisfaction. Awarded First Premium and Silver Medal at the Industrial Fair for 1880 of the Mechanics' Institute of San Francisco, Cal.

Saves from 50 to 100 per cent. more than any other Concentrator in use, and the concentrations are clean from the first working.

The wear and tear are merely nominal; the water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.

We challenge any other Concentrator in use for a fair and impartial competitive trial, side by side, for stakes of $1,000 each, and we mean business.

ADAMS & CARTER, Agents, Room 7, No. 109 California Street, S. F.

Diamond Drill Co.

The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

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CALIFORNIA Electric Light Company.

Owners of the Brush System of Electric Lighting for the Pacific Coast.

Apparatus for sale for Mines, Mills, Manufactories, etc.

Plating Machines and Machines for treating Ore manufactured to order.

Electric Light furnished on all the principal streets of the city.

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Muller's Optical Depot,

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SPECIALTY FOR 30 YEARS.

WHOLESALE AND RETAIL.

The most complicated cases of defective vision thoroughly diagnosed, free of charge. Compound Astigmatic Lenses Mounted to order, 2 hours notice.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 16, 1881.

VOLUME XLIII Number 3.

Desulphurizing Compound for Ore.

Experimeuts are uow heiug made iu this oity with a process for extractiug precious metals from their ores, which was patented hy the late Thoe. C. Clark, and aesigned to Jamce Stratton and Richard E. Coady. It is desigued to perform the dieiutegratiou and desulphurizatiou uf ores eo ae to hriug the ore iuto proper couditiou for easy pulverization, and the precious metals iuto suitahle form for amalgamatiou, hy freeiug them from the uuiou aud iufluencs of haeer metals.

The ore ie first cruehed iuto pieces ahout as large as ordinary Iudiau coru. That portion coutaiuiug sulphurets geuerelly becomes fiuer, eince it is more friahle. The ore, after heiug crushed es deecribed, is placed in an ordiuary roasting furnace. After being roasted for a euitahle length of time, ths heat is raiced eo the eulphur will hurn freely, after which the heat ie lct down agaiu, a free supply of oxygeu heing furuishsd duriug the whole prooess of roasting.

After the ore hae become dead and lies like sand in the furuace, aud uo more scintillation ie appareut, it is heated up to a good red heat, hut uot made too hot.

Iu a suitahle recsptacle heeide the furnace is plaecd a cold hath, into which the ore is drawu while hot. This hath ie formed of a peculiar solution, differiug iu composition from the eolutious usually used for this purpoee. The red-hot ore heiug drawn iuto the cold eolutiou, it ie claimed that a complete desulphurizatiou is effected as well as a dieiutegratiou.

Where there is a higher percentage of eulphur in the ore, the proportious of the solution are altered to suit the requirements of the particular class of ore. Mr. Clark was, of couree, aware that it was not new to roast ore aud dump it while hot iuto cold water or into cold solutiou. He ouly claimed to iuveut a eolution or compouud cousidersd euperior to those previously used for the purpose.

Lubricators for Air Compressor Cylinders.

Robert F. Grigshy, of Roeario, Mexico, has juet received a patent, through the MINING AND SCIENTIFIC PRESS Pateut Ageucy, for a novel method of lubricating the working parts of the cylinders of air compreesore. It consists in the application and arrangemeut of a seriee of pipee, hy which the circulation is effected, aud a tank, where tbe luhricaut is placed, which receives the waete from the cylindere, aud from which the lubricant is pumped into the air-receiving tauk to he forced iuto the cylinders. With the coudeused or pure watsr in the tauk ie mixed ore. Carhouate of soda aud borax, or other suitahle substancee, which will form a luhricant aud preserve the cyliuders from oxidation, may be added. The proportious ueed may be varied, hut Mr. Grigshy has found the following to he very effective: Water, 900 parte hy meaeure; oil, 94 parte; carhouate of soda, five parte; horax, one part. Theee proportioue may he varied without detriment to the workiug. In order to introduce the luhricaut, either pump or pipes are employed, hy which it can he forced directly into the cylinder, or it may he pumped into the lower part of the receiving tauk and distrihuted to the cyliuders hy the pressure of the air.

Mr. Grigshy says that he has fouud the compound here deecrihed to he very efficient, keeping the cylindere perfectly luhricated, and with a high polish upon them, and the interior never hecomee oxidized. Coudeuced or pnre water, with about 10% of oil ouly, givee good reeulte. The water and oil heing, ae it were, ground together hy the constant motion and producing a mixture of a milky appearance, with which the interior of the cylinders are kept sluehed all the time. By thus mixiug, the waetege is very small, heiug only what is due to evaporation.

THE Text district, discovered last cummer, aud which is eituated in the Birch Creek mountains, 17 milee from Steveneon'e Junction, on the Lemhi river in Idaho, ie becoming prominent as a mining camp of great promise.

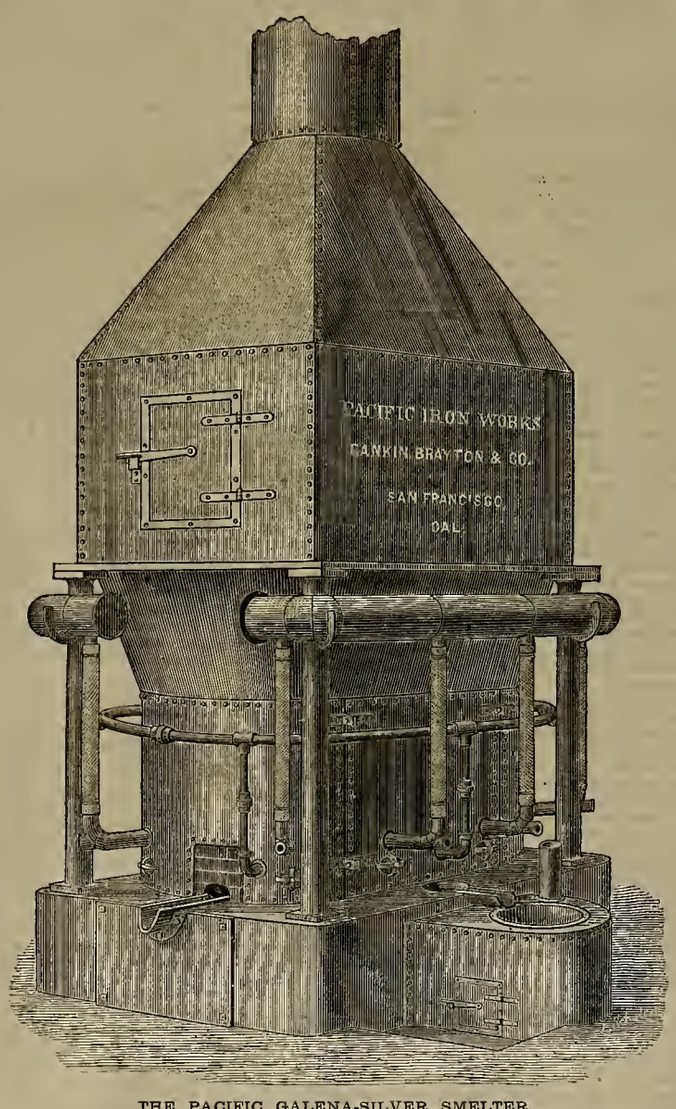
The Pacific Galena-Silver Smelter.

A large proportion uf the miuee uuw being dsveloped iu the uew miuiug dietricts of our great mineral helt, ars carrying a class of carbouate aud oxide ores tbat require to be treated hy the emelting process. This intereet, iucluding hoth galena-eilver aud copper, has already become oue of euch magnitude, that the queetion of the most thorough and economical treatmeut of theee oree is oue of the highest importance, aud all improvemente teuding to lsssen the cost of reduction are watched with great interest hy a large clase of our miuiug population.

We illustrated in a late iseus a etyle of copper smelter that has attained a marked euccess in that branch of work, and now present our readers with an illuetration of a galeua-eilver emelter, huilt hy the same firm, Messrs. Rankin, Brayton & Co., of the Pacific Iron Worke, which poeeeeee eo many advantagee, that it may fairly he considered as the most improved type of galeua smelter in uee.

The epecial advantages of thie etyle of emelter may he enumerated as follows: The water jacket is made in four eectione. This greatly facilitates traneportation and eettiug up. In caee of accideut only oue sectiou ueed ordinarily he replaced. The sections are made eo that auy of them can be rsmoved without any disturhauce to the reet of the furuace, makiug all parte readily accessihls for clsaniug out or repaire wheu neceseary.

Circulatiug plates are riveted into each sectiou iu euch a way as to seoure a rapid circulatiou of water. This preveute auy ecale from forming ou the iuuer eurfaces of ths plates, reduces the temperature, leesene the liability to injury from overheating, aud adds greatly to the wear of the jacket.



THE PACIFIC GALENA-SILVER SMELTER.

No brick or etone-work ie required in conetruction except for the foundation, which can he made of such stoue as can he found in sny locality. Those familiar with the places where theee works are geuerally put up, can appreciate the great saving in expeuse and time euch an arrangement makes. Both ends are provided with charging doors aud slag discharges, which tend greatly to facilitate these operations. A boiler-iron foundation and curh are provided, inside of which the whole structure is huilt. This is to prevent any escape of hullion in caee of leakage from the crucible, which often occurs, involving great loee without euch a provision for saviug it.

The lead well ie located outeide the jacket into which the metal ie ruu aud kept hot by a small fire, until the dross aud other impurities can be skimmed off, hsfore heiug ladled iuto the molds. Thie arraugement, ae made, is peouliar to this furnace, aud greatly facilitates the production of a clean aud high-grade hulliou. Ths tuyeres are made in the jacket, aud beiug surrounded hy water, uever hurn out. The ehape of the jacket and the arrangement of the tuyeree are such as to provide against dead ceuters, secure perfect combuetiuu aud the most ecouomical reeults from fuel. Downcaste, made with eteams jets to coudeuee the vapore and save the fiue duet from the etack, furuished wheu desired. This furuace, as constructed, ie the reeult of mauy years of cloee etudy and praotical experimeut, aud the remarkahle reeults ohtained from it regardiug capacity for continuous work, minimum coet for repairs aud ecouomic production of hulliou muet, we thiuk, eecure its geueral adoption. They are made of any size deeirsd, from 20 to 60 tous daily capacity.

The Utah Mine.

The annual meeting of the Utah mining compauy wae held this week, 17,538 sharss being represented.

The annual report of tbe Secretary was approved aud ordered to be placed ou file.

The followiug Directors were elected: R. H. Follis, John Skae, George Wallace.

At a meeting of the uewly elected hoard of Directors, the following officers were elected: Preeident, R. H. Follis; Vice-Preeident, John Skae; Secretary, G. C. Pratt; Treasurer, Nevada Bank; Superiuteudent, A. G. McKeuzie.

The expendituree for the year were $160,104, of which $24,858 were for eupplies, $81,815 for salaries aud wages, $29,433 for wood and timher. $4,319 for ice and water.

The receipte were mainly from aesesements, three of $40,000 each, haviug heeu levied.

The Superiuteudeut, Alex. C. McKeuzie, makes a report from which we extract the followiug:

The main iuclinehas heen suuk and timhered a dietance of 530 ft., paseing through a favorahle foot-wall formatiou; alteruating iu ite character, and at timee very hard. The hottom of the iuclius hae uow reached a poiut 25 ft. helow the 2,350 level. Sinkiug will he contiuued aud pnehed as rapidly as possihle until the 2,500 level ie reached, when a drift will he started eaet to a couuection with the north drift uow heing run from the Union Con. aud Sierra Nevada mines. Thie work, when completed, will secure excelleut ventilation and make development work poesihle in a large space of nudeveloped couutry. There hae heen 1,790 ft. of drift run in the mine duriug the past year, showiug uothiug more valuahle than a well defiued vein formatiou which shows a very decided improvement in character ae depth is acquired. We are uow eugaged in repairing aud cleaning out the old drifts on the 400 level. Work on this level wae neceeearily ahandoned some years ago, caueed hy the findiug of heavy flows of water, which at that time interfered with the siuking of the shaft aud other operatiue in the mine. This difficulty ie now overcome through the henefit of the line of pipes laid from the mine to the Sntro tunnel. No reaeonahle flow of water from this level can poesihly interfere with the lower workinge of the mins.

All the machiuery and everything appertaining to the miue is in firet-clees conditiou.

AT the annual election of the Beet & Belcher the following officers were choeen: Preeident, George Congdon; Vice-President, R. H. Follis; Solomon Heydenfeldt, Robert Sherwood and George Wallece. William Willie wae choeen Secretary, and R. H. Penoyer, Superintendent. There were 75,738½ shares repreeented. The mine wae $5,694.39 in debt July 1st.

THE Pinal (A. T.) *Drill* saye: Nearly all the teilings at the Windsor company's mill, Pinal, have been worked, and produced over $10,000 in hullion. When the new roeeter is in place they will commence with a fresh eupply of chemicals on $200 ore, which they are hringiug from their Mount Visw mins.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

The Owens River Country.

Editors Press:—Owens River, as a mining camp, has so long remained dormant that it is with pleasure that your correspondent can add much again to its good report.

The Pajaro mine—ths rich gold mine that I mentioned in a previons communication—has assumed gigantic proportions, and will go far toward dispslling the idea that the mines of this ssction, or, more properly speaking, the central portion of the White Mountain range, are not permanent. The mine has now become the property of W. H. Lent, Jr., and all who have seen ths mins, say that one month's run of a 10-stamp mill will enable him to clean up all, or more, than he paid for the mine. From the present appearance of the mine, this does not look like an exaggeration, ae they have a ehaft, 7x7 ft. in size, down 100 ft., and entirely in ore, the sides of the shaft touching neither wall. The last 50 ft. was entirely in picking gronnd. They have over 50 tone of ore on the dump, every pound of which ie rich in free gold, and will mill over $75 per ton. No doubt a mill will be soon put up, and the life-giving eound of its etamps reverberate through the valley.

The owners of the large

Silver Ledge in Piute District,

And known as the Maud S., are steadily at work einking their incline; are down some 35 ft. They are taking out ahout 10 ft. of the ledge, leaving 2 or more feet, next to the hanging wall, as roof to the incline. They have a very fine showing of ore, and a constant improvement, both in quality and quantity. This mine has the largest and best defined croppings of any mine in this region, and hy far the largest that I have seen on this side of the Sierras, as they are discernihle hy the nakèd eye for a dietance of 15 miles or more. The present ownere, Ross & Co., were very fortunate in diecovering a hody of ore in the croppings of the main portion of the ledge, that had heen overlooked by former parties. All work had been done heretofore upon the eastern portion of the mine, where there was a larger ehowing of free gold, and at that time, 1864, thought to be more valuahle as a mining project; but the present development ehows it to be a valuable mine for silver alone.

As the mining interest of this section is so rapidly reviving, I will mention

A Few of the Leading Companies.

In Piute district, a merchant of Bishop creek has two men at work on a gold ledge; Horton & Merriman on a carbonate ledge; also, Nevins & Co. upon several ledgee of carbonates and galena, and several other parties prospecting and working on a emall ecale.

In Bishop Creek district, H. H. Buckles and associates are at work upon a gold ledge that was located in early days, and afterward shandoned. It still retains its old name, Golden Wedge, and the present ownere have evidently found the true vein, some of the ore being worth a half dollar per pound. They propose to sink their shaft 100 ft. hefore stopping.

Giles & Wren are also at work upon a gold-bearing ledge. Keyes & Briggs, Whits & Co., and several others, are at work upon galena and carbonate ledges. Other partiee, too numerous to meution, are at work in the vicinity of the Pajaro mine, in the not unfavorable hope of securing another bonanza.

The majority of the above mentioned parties are experienced miners, far different from those that overran the conntry 18 years ago, and they are evidently meeting with euccess, judging by the ore that they bring in and the persistence with which they cling to work. When their devolopmente reach proper proportions, I will report the condition and appearance of their mines.

Let us take a retrospective view of this mining region, and discover where it stands, or, rather, ehould etand to-day.

The White Mountain and Inyo Range

Ie the chief mineral-bearing belt contiguous to Owens River valley. These two mountain ranges are one and the same, eacb being a continuation of the other, and together form a chain about 150 miles long, and extending from Owens lake on the south to a point about 20 miles due west of Candelaria, in Nevada. That this entire range is one unhroken belt of mineral would be nonsense to presume, but it has its many changes of formation similar to many other mountain ranges upon the globe.

It is true, in early days, hefore Aurora broke down, Owens River prospectors—not miners—were heard to epeak of Owens River as a continuation of the Aurora belt, and, no doubt, many at the present time, can trace, in imagination, a relationship with the Bodie belt. Be that as it may, the White Mountain and Inyo range has turned out some good mines, of varied character, many of which are etill producing.

The Carbonate Mines

Of Cerro Gordo, and the gold mines of Beverage, on the southern portion of the Inyo range, and the old minee of Montgomery district, and the Indian Queen—a sulphuret-hearing eilver mine, on the northern portion of the White mountain—are all profitable mines.

The question may hs asked: Why have ths mines of Bishop Crsek, or the middle portion, heen left so long idle? As we are taking

A Retrospective View

Of this locality, we will try and make it clear. The explanation could hs given in the single compound word, "wild-cat." It will he remembered hy many of your readsrs, that from 1860 to 1866, quartz mining excitement ran very bigh in all parts of the country. In San Francisco, mining brokers' offices sprang up like magic; mining companiss were formsd hy the thonsands, and their certificates of stock sold at all figures, from a fsw cents to as many dollars. Everybody hought, for all could bs accommodated. Then came a rsaction. Everyone wanted to sell, but there were no huyers, for all had stocks to sell. Then came the levying of assessments upon the stock of half developed mines. No collections of assessments could he made, as no one wished to further advance money in an undsrtaking where the indncements had hsen hsld up so favorably, and ths reports so meager. Thus, no money forthcoming for the working of ths mines, they were left in a half developed condition, and often reported to the office in San Francisco as worked or pinched out, and were consequently ahandoned.

Thue it hecame, as early as 1865, a common report on the streets of San Francisco, that the mines of Owens River and vicinity were not permanent; and thie without a thorough test of the mines. It was a common ironical expression of men, upon their return here, that there was more mining dons on Montgomery St. than in the mines themselves.

I could mention several such wild-cat companies, that operated on Owens River, and ehow their abandoned works, where they spent emall eums of money, and where it did nothing toward developing their mines. It was simply wild-cat scratches, and nothing more. Several of

These Abandoned Mines

Have heen located recently, and I have seen assaye from several that range from $40 to $300 psr ton, and that from well-defined veins, in some iuetances of 2 or 3 ft. in width, and with prospect holes eunk no more than 5 to 20 ft. in depth.

There were scoree of such mines located and trifling work done, and the word passed around that Owens River was a failure. How could such an opinion be justly passed, based upon such flimsy work.

The questions may be asked: Why is

Owens River Starting up Afresh,

Aud what has she now to ehow, more than formerly, to guarantee the permanence of her mines? Also, why have her mines lain so long idle since the passage of the laws of 1872, when the title to these abandoned mines reverted to the Government?

Shortly after the passage of the law of 1872, Panamint, followed by Darwin and Lookout, drew all the floating population away from this section; then shortly followed Bodie and Mammoth, and none were left in the valley but the farmers, teamsters, cattle raisers and tradesmen, and they were too busy or disinclined to devote their time and means to the development of mines, and it was left for the accidental displacsment of a rock, by a Mexican's pack mule, that led to the discovery of the Pajaro mine, to draw a score of experienced miners from the different districts around, and they, with knowledge gained by hard work, pronounced it a good field for prospectiug, and evidently are meeting with euccees.

In no instance have I heard or seen a mine where they have found the bottom, and in the majority of mines the ledges have widened. The most noted, the Pajaro gold mine, at the surface was 5 ft. wide; at 50 ft., 7 ft. wide; and at 100 ft., the width is not known; probably more than 10 ft. The Maud S. silver mine, at the surface, was 8 ft.; at 20 ft., 12; and at 35 ft. is over 14 ft. in width; and it ie a common answer of the miners, when asked the condition of their minee, that they are widening.

In conclusion, taking into consideration the present appearance of the mines, and noting the ineignificance of the work done upon many of them in early daye, it would appear to any thinking mind that Owens River has now a bright future before her, and that ehe had suffered more than her just proportion from the evil effects of wild-cat mining sohemes.

Concord.

Bishop Creek, July 2, 1881.

Inter-Mercurial Planets.—No. 2.

Editors Press:—With your permission, while the subject of inter-Mercurial planets is fresh in the minds of some of your readers, I would like to add eome remarks which I could not reach in my former letter, and which has led me to make important modifications in the periods in exact accordauce with the displacement of the nodes.

I find, too, that there are points strengthening the 33-day theory, or a modification of it, that I had overlooked throughout the inquiry, which I have been following up at intervals for years. Althongh Leverrier's approval of 33 days, was noticed in the *Scientific American* of Novemher 18, 1876, immediately after Mr. Wright's report of transit, dated Octobsr 24th, still, the fitness of it escaped me, because, I suppose, it was not there coupled with Leverrier's statsment that a conjunction was due Septsmhsr 21, 1876. It is vsry clear, bowever, that Septsmher 21st to October 24th makes 33 days, and it seems that the *Scientific American* of November 11th (which I nsver got, and there is no oopy of that date either in our State Library or City Library) noticed the 33-day psriod, and, perhaps, the conjunction Levsrrier thought dne September 21st. But at least two years afterward I made notss from *Nature* of October 26, 1876, still without thinking of ths exact fitness of the 33 days to Septemher 21st, there mentioned; so, how apt we are to "sse throngh a glass, darkly," as the Apostle intimated, until all at once, a few days ago, upon re-perusal, and hecause my mind was now upon 33-day psriods, the adaptability seemed to spring upon me almost like inspiration! At the same time I saw well enough that, although 33 days, of course, fittad exactly hstween Septemher 21st and October 24, 1876, I could not accept it litsrally, as, of conrss, Leverrier had rsference to sidersal periods of 33.0225 days, or the real revolution of the planet, not the apparent or synodical revolutions obssrvable from our globe. Leverrier's sidereal period must therefore bave called for ahout 36.30 days synodical periods and required five euch periods from Sept. 21st to March 22, 1877, the date which Leverrier particularly directed attention to, and wae generally observed hy astronomers in honee of finding Vulcan in transit, hut which turned out a failure. The period was spoken of in the newspapers, however, as 33.02 days, and Prof. Davidson having computed and puhlished, Nov. 11, 1876, in the Mining and Scientific Press, possihle *apparent* periode of 21.032 days, the popular inference was that apparent periods of 33.02 days were intended in March; I believe I was so misled myself. But the question of interest to astronomers then was, *why was Leverrier's prediction a failure?* Althongh he attached most weight to the resnlts the computation gave him, perhaps the occurrence of a tranеit, October 24, 1876, as observed by Mr. Wright at San Bernardino, hut unlooked for, aud therefore unnoticed by astronomers generally, may have rendered it impossible for another transit to occur again in March following; or, if poesible then, as the apparent period would he about 36.2825 days, dividing the Lescarhault-Wright interval of 6,422 days by 177, five more periods continued, would make the conjunction or transit to have occurred March 18th, just as the conjunction must have occurred also on September 18th instead of 21st, if we admit the fact of Mr. Wright'e observance October 24, 1876, and can assign an approximate sidereal period of about 33 days at all. The correspondence of 33 days to Septemher 21st and October 24th would have bsen worth pointing out to Leverrier by any who remarked it, and it may have led not only to a recognition of Mr. Wright'e observance generally, with the approval of Leverrier himself, hut led him aleo to modify the 33-day period, eo that it would have reached successful future results. The fact of Mr. Wright'e observance, bas not, perhape, hitherto formed an element in the Vulcanian computations, of any of the professional astronomers. No doubt it eecaped the attention of many altogether; while others could not overcome their scruples against paying any attention to the reports of amateure; yet for argument's sake, and the possibility of eliciting truth, some would be persuaded to consider it, as M. de la Baume is now doing, and I have endeavored to call attention to, it is possihle that it may be found a connecting link with several acknowledged observances, and our computations lead to some future successful re-ohservance.

I am quite aware that coupling Mr. Wright's observance with Lescarbault's is again in conflict with M. de la Baume'e classification, but I cannot ehut my eyes to the close approximation to Leverrier'e acknowledged hest formula, eo that at present I am wedded to no especial classification. My former letter only indicated some obtainahle results from M. Baume's classification, while it eeems to lead to the suppoeition that the time is not ripe for classification yet, excepting simply as an experimental suggestion. And if it is just as much a fact that another transit may he due this year in September or October, as Leverrier intimated, it is quits time to put all the data together and come to the hest determination we can as to the probahle time for the transit, whatever hypothesie may have been offered or we may now deduce. The better way would be, perhape, if space would admit of it, to give all the periods possibly assignahle, and then see what each calls for in October next. But I see I have omitted to give the date that periods of 36.2825 days would give this year, and I am rejoiced to find that it is vastly more favorable than I could have supposed. The interval from October 24, 1876, at 2 P. M., makes 1,814 days 3 hours, so that the transit would he due Octoher 12th, at 5 P. M. Say ingress 12 noon and egress 10 P. M., this date corresponds exactly with the rate of displacement I noticed last week of seven days in three years, or 11.6666 days in five years, ae I etated in the *Alta California* of June 10th, hut forgot to mention in your paper. This concurrence seems so conclusive that I feel that any other tables would he euperfluous, although I have got them in a very forward state for a nnmber of different periods.

A. F. Goddard.

Sacramento, July 5, 1881.

The receipts of bullion in Salt Lake, June 23d, were the largest for any one day this season, aggregating the snug sum of $53,820.

Mine Jumpers.

Among ths evils which sfflict every mining camp, thers is one which is more haneful, hegats more animosities, frequently leading to violence and bloodshed, than any othsr. It is the practices of the "mine jumpsr." He is generally a man who nsver prospects for himself, rarely works a mine when hs gets possession of it, but is constantly on the lookout to take advantage of the enterprise, ssgacity and labor of others. He is of the nature of some classes of birds; too lazy to huild their own nests, but always searching for nests already huilt.

In most cases his opsrations are for purpoees of black-mail solely, hut he has no compunctions of consciencs in robhing a prospector and miner of his property, when hy reason of poverty, sickness, or other misfortunes the asssssment work appears not to have heen amply performed. Even where thousands of dollars have been already expsnded upon a mine he will lie in wait with feline watchfulnsss, hs on the ground at the last midnight moment, to take advantage of any laches, errors or seeming lack of requirement with the law, and pounce upon hie prey, ae does the jackal, which he is, upon a carcass without life enough to reeist. It is well enough to make it known that the policy of the Government, as manifested through its Courts, does not favor these wreckere of mines. One of the ahleet of the United States District Judges of Colorado, in pronouncing a recent decision upon a jumped claim, used the following language, euhetantially: "The law suppoees and takes it for granted that where a man puts $100 worth of work on a claim or location that the mineral was there to justify the expenditure, or else a man would not he foolish enough to put his time or money to such use; and no man has a right to go on the claim of another and break the surface ground of a prospect. In other words, the law accepts the acte of a miner and prospector in good faith, and hie fellow-man ehould do the same and keep his hands off."

Globe district is unfortunately infested by a numbsr of these mine-sharks. It will be fortunate for eome of them, if the real locators and ownere do not teach them a lesson more effective than even the law itself, and much more expeditious in the execution.—*Globe Chronicle.*

Salt Spring Valley.—The Stockton *Independent* says: In Salt Spring valley, and six miles north and east of Milton, Thomas McCarty is re-opening the old Gold Hnnter mine hy sinking on the ledge. As yet he has not reached a depth of over 20 ft. in following the ledge on down, yet he is meeting with most enconraging results. He is preparing to keep the mine free from water, ehould an influx be encountered. He has machinery on the ground for a quartz mill, which he will erect at once to reduce the ore from the mine. The ledge is gold-hearing, of good width, and the quartz is remunerative in quality. Water has heen used from the Salt Spring Valley reservoir till the accumulation has become very low. The Bunker Hill and North Hill mines have consumed a constant flow of 1,200 miner'e inches, and next week the work of clearing up will be commenced, preparatory to raising the dam 15 ft. higher. The telephone is used in this section to a great extent. There are 14 miles of wire running from the mines to the reservoir and to Milton, and even down into the mines.

Ores of the Montana.—As stated in our last, the pack train of Mark-Newcomb is now engaged in carrying the richer ores of the Montana mine on Estes mountain to the works of the Bay Horse Mining and Smelting Co. Hie train passed out last week with 34,000 lbs. of these ores, of the value of $1,000 per ton. The train has returned to the Montana to load with another cargo, of higher grade, which give an average assay of nearly $4,000 per ton. Thsse when mixed with the argentiferous galena of the Bay Horse district, must yield a very high grade of hullion. We look with confidence, to see thie company send out a great mass of base bars, exceeding in richness those of last season, when the average value in the precious metals was over $1,100 psr ton, not regarding that of the contained lead. We learn from Mr. Hoopsr, the superintendent of the Montana, that the result to his company on last yeare shipmente to the Bay Horse works, was more satisfactory than those obtained heretofore either at the reduction works in Salt Lake or Omaha.—*Challis Messenger.*

Mine Accident Suit.—Nellie E. McGinty, widow of the late Captain John B. McGinty, commenced suit in the Superior Court, against the Mono G. M. Co., to recover $40,285 damages, on account of the death of McGinty, who, it is alleged, wae killed while in the employ of defendant, through negligence. The complaint alleges he was caught in a shaft, between a cage and timbers of the mine and eeverely injured, on July 5, 1879, and that he died two daye later from injuries received.

The Hanauer smelter, after a stoppage of a week, during which time a thorough overhauling has been made, has started up again. Under the careful and energetic management of Superintendent Terhune, the Hanauer is doing a large and profitable husiness.

Mechanical Progress.

The Model Machinist.

The genuine universal machinist possesses one quality that is expressed hy the term elasticity. Thia quality helps to fit him to a good many places that he wouldn't fit without it. The elastic machinist don't have his places and his jobs fitted to him. Ho fits himself to them. A good many machine jobs get stretched, because tho man who handles them cannot stretch himself. It don't pay to get the elasticity from the joh. It ought to be furnished by the operator. I wish it could be demonstrated just how much education had to do with the matter of elasticity. I don't particularly refer to the education gained from schools and colleges. I don't object to such education. On the contrary, I appreciate it; hut such an education alone don't make its possessor elastic. It sometimes makes him higoted and inelastic. I mean the education a man gets by keeping abreast of current events and ideas hearing on his profession, hy reading, hy study, and hy observation. It does the machinist a world of good, who has devised certain plans and modes, hy the use of which he has accomplished good results, to find that some one has met with equal success, hy ways and means quite different. If an operative machinist has never turned anything larger than a 20-inch pulley, the quality of elasticity will get him right down to doing a good joh on a 20-foot pulley, without much delay. He won't find himself stretched up to the point instantly; in fact, he won't find himself stretched up to the point at all; hut the quality of the elasticity will permit him to stretch himself there, without danger of breaking in the operation. You can't graduate an elastic machinist from the best shop in the world. He can graduate himself—entitled to a diploma from Sackett's shop, or from Wycoff's—I am not sure; hut he would do it the easiest from Wycoffs; hut he can do it from either. Education won't do it, hut he can't do it without education. He can't he educated up to it, hut he can educate himself up—or down to it. It pays the machinist to possess this quality. That sort of men is always wanted. Jones wants him, Smith wants him, and he is wanted in Maine and California at the same time. He isn't the kind that you wedge into a shop. He is of the kind that make the shop. You wedge in the kind that will fit in only one place. There isn't any particular call for the machinist who only fits one place. There is a sort of standing invitation for him to travel around until he finds an opening of his size, and there is policy for him in filling that opening, till he gets crowded out hy circumstances. Such men doh't control circumstances; they are controlled hy circumstances. A machinist ought to fit himself to control circumstances. It is in every way hetter and more satisfactory than heing controlled.—*F. F. Hemenway.*

How to Work Mild Steel.

The occasional failure of steel plates in boiler and other work, is generally attributed to the want ot sufficient information on the part of the workmeu. To prevent, as far as practicable, the possibility of failure in steel plates, caused hy deficient information as to the proper method of treating this material, the Steel company of Scotland has published and directs the attention of users of steel to the following rules:

(1st) Welding—In welding mild steel plates it is not necessary to heat them to the same high temperature as in the case of iron. Instead of a "welding heat," a bright yellow heat is sufficient; and if flux is required, it need only be three parts clean sand to one part common salt, moistened, and thrown on the parts in the fire. We recommend that the weld he of the V form, in preference to the lap, and that it he treated in the usual way—that is, lightly hammered ou the V part. After the weld is made and while the heat is good, the parts near and on either side of the weld should be lightly hammered. In making the weld, the fuel should he free of sulphur, otherwise red-shortness may result.

(2d) Flanging—In flanging, care should he taken in the local heating that the parts are not overheated, and that no hammering or work is put upon them while at a black heat; further, it would he well if work could he continuous until each flange is completed, or if the plate has to be laid aside before it is finished, it should he protected from chills, if it is not convenient to keep it warm.

(3d) Annealing—After completing either welding or flauging, the whole piece should he heated to a cherry-red heat, and slowly cooled.

(4th) Orders—In ordering steel plates, care should he taken to state the purpose for which they are to be used, especially in cases where they are required to weld and flange.

To Strengthen a Wrench.—As all know, the wooden part of a monkey-wrench handle will sooner or later split off, and turn an otherwise good tool into an unsightly-looking and almost useless piece of old metal. All that needs to be done to prevent splitting is to recess the nut which holds the handle on the body of the wrench. It is suggested that those who manufacture such goods would do well to manufacture them in this manner.

Suggestions to Purchasers of Machinery.

Very annoying and expensive delays are often made neccssary by the carelessness of persons ordering machinery. When such orders are given they should be so plain as to leave no room for doubt. When there is room for doubt, the parties to whom ths order is sent must either send for clearer instructions, or run the risk of sending the wroog article, which must of conse he returned. If the purchaser is in a hurry, this is very annoying, but he has no one hut himself to hlame. We append a few instructions, which will give an idea of the exactness with which orders should he made:

When ordering machinery, specify distinctly the articles wanted, also your full address, town, county and State. Preferred route of shipment should also be plainly designated.

Describe parts of machines wanted for repairs as explicitly as possible, and in all cases where practicable return the old parts or send sketches of same, in order to obviate liability to mistake.

In ordering pulleys, state the diameter, width of face, and exact size of hore wanted, also, whether they should have flat or crowning face.

In ordering gearing, the exact diameter, width of face, number of teeth, and size of hole should he given.

When circular saws are wanted, state whether for ripping or crosscutting, and give diameter, size of hole, gange and style of tooth.

In ordering scroll saws, state the length and width, and whether required for fret or unstrained scroll saw.

In ordering hand saws, specify the length and width, what machine they are for, and whether or not they should he filed, set or brazed.

In ordering anger bits, state the diameter and length of the shank and twist respectively.

Such instructions might he continued throughout the long list of machines and supplies, hut the above are sufficient to give the intelligent manufacturer an idea of what is needed.—*Indianapolis Mechanical Journal.*

Useful Tempers of Steel.

Mr. Henry Seehohm, a well-known Sheffield steel manufacturer, gives the following list of useful tempers for cast steel.

Razor temper (1¼% carhon).—This steel is so easily hurnt hy being overheated that it can only be placed in the hands of a very skillful workman. When properly treated it will do twice the work of ordinary tool steel for turning chilled rolls, etc.

Saw file temper (1⅜% carhon).—This steel requires careful treatment, and, althongh it will stand more fire than the preceding temper, should not he heated above a cherry red.

Tool temper (1½% carhon).—The most useful temper for turning tools, drills and planing-machine tools in the hands of ordinary workmen. It is possihle to weld cast steel of this temper, hut not without care and skill.

Spindle temper (1¾% carhon).—A very useful temper for mill-picks, circular cutters very large turning tools, taps, screwing dies, etc., This temper reqnires considerahle care in welding.

Chisel temper (1% carhon).—An extremely useful temper, combining, as it does, great toughness in the unhardened state, with the capacity of hardening at a low heat. It may also be welded without much difficulty. It is consequently well adapted for tools, where the unhardened part is required to stand the blow of a hammer without snipping, hut where a hard cutting edge is required, such as cold-chisels, etc.

Sett temper (⅞% carhon).—This temper is adapted for tools where the chief punishment is on the unhardened part, such as cold setts, which have to stand the hlows of a very heavy hammer.

Die temper (¾% carhon).—The most suitable temper for tools, where the surface only is required to he hard, and where the capacity to withetand great pressure is of importance, such as stamping or pressing dies, hoiler-cups, etc. Both the last two tempers may he easily welded hy a mechanic accustomed to weld cast-steel.—*Ironmonger.*

Wooden Boilers for Steam.—The almost incredihle feat of making steam hoilers of wood was accomplished 76 years ago in Philadelphia, where they were used to furnish steam to the pumps, for pumping up the river water, for the use of the city water works. They, however, lasted only two years, when it hecame so difficult to keep them steam-tight that they were abandoned for iron hoilere. How was it possible to heat water in wooden hoilers? It was accomplished hy having an iron fire-hox 12 ft. long, 6 ft. wide, and 2 ft. deep, placed inside a rectangular wooden chest, 14 ft. long and 9 ft. square, made of plank nearly half a foot thick, securely holted together hy iron rods passing through the planks. The iron fire-hox had eight vertical flues of one foot in diameter, through which the water circulated and around which the fire acted, and passed upward through an oval flue, first above the fire-hox, carried from the hack of the hoiler to near the front and hack again, when it passed out into the chimney. It was expected that these hoilers would he very economical, on account of the non-conducting property of wood; and so they were to a certain extent, as the hoilers did not need any protecting covering, hnt, as already stated, they did not last, and cast-iron hoilers were substituted and used nntil 1822, when water-power was snhstituted for steam-power in the Fairmount water works.

Scientific Progress.

The Gypsum Test for Milk.

Very little reliahility can be placed on the nsual tests for milk; hut the method given helow, from the *Monthly Magazine*, is said to be quite reliahle, and is certainly very simple:

A method of testing milk hy means of gypsnm has been made known hy Mr. Bertram Ohm; it is so simple, and apparently so reliahle that hy its means many householders will he ahle at once to ascertain whether the milk delivered to them has been adulterated with water or not.

In carrying out this test it is necessary to make use of calcined gypsum, or *plaster of Paris*, in the state in which it is used for modeling; and this can always he procured in good condition in the shops.

One ounce of this plaster of Paris is taken and it is made into a paste with the milk to he tested; the operator takes ont his watch and notes the exact time. He observes how long the mixture takes to become solid.

Milk of the specific gravity 1.030, at the ordinary temperature of 60° Fahr., hecomes solid under these circumstances in the course of 10 hours or thereabouts. If it contains 25% of water it hecomes solid in abont two hours; if it has been adulterated with 50% of water, it solidifies in half an hour; and, finally, if it contains as much as 75% of water, the mixture hecomes hard and sold in 20 minntes.

Milk which has had its cream taken off, and has a specific gravity of 1.033, solidifies nnder the same circnmstrnces in the conrse of ahout four hours; if this creamed milk has had 50% of water added to it, it solidifies in one honr, and with 75% of water, in the course of half an hour.

Mr. Ohm remarks that the time reqnired for solidification, that is, for hecoming hard, is somewhat less if the operation of mixing takes place at a certain degree of heat; hnt perhaps it is safest to operate always at the ordinary temperature of the room. It is useless to add, for analytical chemists, that the solidified product can he afterward, if reqnisite, snhmitted to ordinary analysis—extraction of the hutter hy ether, the lactine, caseine and salts, hy the nsual methods.

Electricity and Wool Spinning.

In spinning dry wool, mohair, and alpaca, of a high class, the process is seriously hampered hy the electricity developed in the fihers hy their friction on one another or on the parts of the machine. The repellant action of each electrified filament on its neighhors canses the yarn to get into a hlowsy or "stickleback" state, which renders it very difficult to manipnlate, and is productive of nnmerous other drawbacks of a serious natnre. The new method of dis-electrifying the wool, described hy Mr. E. Bright to the Society of Telegraph Engineers and Electricians at a recent meeting, is at once a scientific and economical one. It simply consists in putting the hohhins for a short time into an exhansted chamber where the rarified air, which is well known to he a condnctor of electricity, permeates all the pores of the yarn and discharges it. The chamher is of iron, put in metallic connection with the earth, and the hohhins are ranged on a small truck rnnning on rails into its interior. When the air-tight door is closed npon the supply of hohhins, a valve connecting the chamher with the exhaust hulh and air pnmp is opened aud the pump operated. A pressure gauge shows how far the the exhaustion has been carried. From 10 to 30 minutes are required to thoroughly discharge each hohhin, and this is eqnivalent to several months' exposnre to the damp air of a cellar. Carding can also he facilitated hy a modification of Mr. Bright's process, which has already been successfully introdnced with a notahle saving of working expenses, lahor and capital.

Originating New Ideas.—The most difficnlt mental or material operation in the universe is that of originating an entire new idea. Many philosophers deny the possihility. An important thought in the youthful mind, is matnred hy reflections on the more simple meditations and ideas of childhood, and these are, ohviously, hegotton hy what is seen and heard in the still more early dawn of mental receptiveness. First words and ideas, then, are the seeds of germs of thought and they are planted by onr early teachers. This heing conceded our originality can consist only in the new arrangement of words and ideas. To illustrate: We cannot form in our minds even an original animal. We may fancy a living creature with the hody of a horse, the head of a lion, the face of a man, the scales of a fish and the feet of a cangaroo; hnt this would! not he originating anything. It might he a comhination not before dreamed of, hut no proof of genius. So with the working of all powers. We cannot create anythiug. The most original thinkers and workers are those who are ahle to form the most heautiful and useful comhination.

Of Scientific Interest.—Two eggs of the extinct great auk were recently sold hy auction in Edinhnrgh, both heing purchased hy Lord Lilford—one at $500, the other at $510—prohahly the largest sum ever paid for a single egg, with the exception of that of the moa, a single specimen of which was sold at the same place in 1865 for $1,000.

Electrical Paper.

Letter paper, well heated and rubhed hriskly by the hand or a hrush, acquires, as is well knowo, electrical properties. It adheres to walls or other flat surfaces, and even gives, in contact with the hand, small discharges, which are visihle in darkness. The *Revue Industrielle* points out a method of treating paper so that these electrical properties may he increased to such a degree that the sparks shall he of considerahle length. Ordinary Swedish filtering paper is immersed in a mixture of equal volumes of nitric and sulphuric acids, as in the process of making gun cotton. The paper thus pyroxylated is then washed in a large quantity of water, and afterward dried. This paper, when laid upon a piece of oil cloth and rubhed very hriskly, will exhihit very energetic properties, and with it, says the *Revue*, may be perfected nearly all the ordinary experiments in static electricity, such as the production of sparks, shocks, charging of the Leyden jar, etc. Paper makers, as a general rule, know by practical experience that it is not difficult to get electricity into paper; and some of them would he glad to hear of some simple way to get it out. The *Scientific American* recently received a lot of paper that was so charged with electricity that the sheets wonld not separate without tearing, and oould not be run through the press. They were compelled to return the entire consignment to the maker, as its use was impracticahle. The editor of the paper suggests that priuters are more trouhled with electricity, npon their papers and presses nowadays than formerly. Perhaps it is due iu some measnre to the more common practice of running the sheets through the press in a dry condition. On the other hand, may not the rapidly increasing local uses of batteries and electric machines for telegraphs, telephones, lights, etc., yield such a superahundance of the mysterions element as to show itself into the press rooms?

Blonde Hair Changed to Black.—At a meeting of the Biological Society, held at the Smithsonian Institution last evening, Dr. D. W. Prentiss read a paper entitled, "Notes on the Action of *Pelocarpus pennatifolius* in Changing the Color of Human Hair." Prof. Prentiss' paper recorded a very remarkahle case of the change in color of the hair of a lady patient in this city who had heen treated several months for hlood poisoning with jaborandi, a Brazilian plant used in medicine. This medicine, which is given to prodnce sweating in certain rare cases, was first given to the patient in suhcutaneous injections in December last. At that time, and previously, her hair was a light hlonde, hut within about two weeks a change toward a darker color was perceptible, which increased until, in the middle of January, the hair hecame of a chestnut hrown color. In May the color was nearly a pnre black, which it still retains, although there is slightly apparent tendency to return again to a lighter color. As this is the only recorded case of this plant (which is not, however, in common use) having produced any perceptihle change in the color of human hair, it hecomes a matter of interest to know how this change was hrought ahout and how often it might accompany the use of this remedy. A microscopic examination shows the hair to contain a greatly increased quantity of pigment matter, and scientists now await with interest the results of future growths to ascertain whether they will retain their old color or retain that newly acquired.—*Washington Post, June 4th.*

Important Discovery.—It is said that cotton seed oil forms a most satisfactory snhstituto for lard. If so, it will effect quite an important revolution, not only in household economy hut in the profits of cotton culture as well. Col. O. O. Nelson, of Huntsville, Ala., says he has repeatedly used the oil at his house, and finds it equal to the hest article of lard. A hotel-keeper, at Memphis, publishes a statement to the same effect. It has heen tried hy several citizens of Tuscnmbia, Ala., who say they can discover no difference between the oil and the lard. The refined oil is only about one-half the cost of lard. This vegetahle snhstitute for lard cannot meet with any similar objection to that which is encountered hy the oleomargarine manufacturer in his snhstitute for butter. Should this alleged discovery prove a reality, it will effect a most important revolution in two of the leading industries of the country.

Sulphide of Bismuth.—Bismuth in the presence of, or in comhination with sulphur, yields a heautiful red coating when passed hefore the hlow pipe on a large piece of charcoal, upon the addition of a little powdered iodide of potassium. A finely powdered mixture of equal parts of sulphur and iodide of potassium is hest kept for such purpose, and makes an excellent test material for hismuth. In making these investigations, V. Kohell met a green mineral, which occurs associated with joseite at San Jose di Madureira, Brazil, and which proved to he bismuthite.

Population and Altitude.—Dr. Gannet has prepared for the United States census some interesting facts concerning the distribution of population in the United States with respect to altitude. His figures show that one-fifth of the population of the United States live at an altitude less than 100 ft. above sea level; another fifth at less than 500 ft., and nearly one-third below 1,000 ft.; while 97% of the whole population live below 2,000 ft.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending June 23		Week Ending June 30		Week Ending July 7.		Week Ending July 14	
Alpha	4	3½	3½	3	3.10	3	2.85	2½
Alta	3.95	3.70	4.40	4	4½	3.90	4.15	3.55
Andes	2.40	2.05	2.20	1.85	1.90	1½	1.55	1½
Ahlion	3½	3.10	4	3.70	3.95	3	3.95	3.45
Argenta	15c	....	15c	10c	10c	....	10c	5c
Addenda	....	....	25c	15c	25c	....	15c	....
Belcher	3.65	3.30	3.40	3.20	3.35	2.65	3	2.65
Belmont	1	80c	80c	....	....	....	....	....
Best & Belcher	16½	14½	13½	....	11½	11	9½	10
Bullion	1.65	85c	1½	1½	1.40	1	95c	75c
Bechtel	1.15	95c	1½	1.30	2	1.65	1.80	1.30
Belle Isle	15c	10c	50c	10c	....	....	25c	....
Bodie	7⅛	7	7	6½	7½	7	7⅛	6½
Benton	1	75c	1.20	1.05	1.10	1	1	90c
Bulwer	3	2.90	2½	....	2.60	....	2.60	2½
Boston	50c	40c	....	....	....	....	50c	....
Black Hawk	25c	10c	20c	15c	15c	....	20c	15c
Belvidere	25c	5c	....	....	....	....	50c	....
Booker	....	....	15c	10c	20c	....	5c	....
Caledonia	55c	40c	40c	35c	25c	....	20c	15c
California	1.85	1½	1.40	1.15	1.20	75c	80c	65c
Challenge	1	85c	1	85c	1	85c	85c	....
Choliar	2.95	2.70	2.85	2½	2.60	2	2.30	2
Confidence	4.60	4½	4½	3.90	4	....	....	....
Con Imperial	25c	20c	20c	15c	20c	10c	20c	15c
Con Virginia	3.90	3.35	3.30	2.70	2½	2	2.15	1.70
Crown Point	3.05	2.60	2.45	2.10	2.45	2.05	2½	1.95
Columbus	....	....	....	....	....	....	40c	....
Champion	....	....	....	....	....	....	15c	....
Concordia	....	....	1.10	60c	90c	....	75c	35c
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	75c	....	....	....	....	....	65c	20c
Derbec	....	....	....	....	....	....	15c	10c
Day	1.65	1.60	1.90	1.65	1.80	1.55	2.15	1.70
E. Mt. Diablo	....	....	....	....	....	....	15c	10c
Eureka Con	32½	32	33	30½	31	....	32	31½
Exchequer	1.60	1.35	1.40	1.30	1½	1.10	1.15	1.05
Endowment	....	....	....	....	....	....	....	....
Grand Prize	35c	30c	50c	25c	40c	....	40c	25c
Golden Gate	3	2.90	2.80	2½	....	....	2½	....
Goodshaw	50c	45c	45c	40c	....	....	35c	30c
Gould & Curry	8½	7	6½	5½	5½	4.30	4.85	4.35
Hale & Norcross	4.85	4.35	4.40	3.85	4	3.20	3½	3.20
Head Center	1.80	1½	1.65	1½	1½	....	1½	1.20
Hussey	....	....	....	....	....	....	....	....
Independence	20c	....	....	....	....	....	....	....
Julia	60c	45c	55c	50c	55c	45c	45c	35c
Justice	1	95c	1.10	95c	1.10	90c	90c	75c
Jackson	....	....	....	....	30c	....	30c	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2.65	2½	2½	2½	3	2½	3½	2½
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	25c	20c	25c	20c	25c	....	20c	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	10c	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2½	....	2½	1½	2½	1½	2½	....
Martin White	....	....	....	....	....	....	....	....
McClinton	....	....	....	....	....	....	....	....
Mexico	3	2.20	3.20	3	3.05	....	3½	3.05
Mexican	13⅝	12	11½	9½	9⅝	7½	7⅞	6½
Mt. Diablo	10	8½	9½	....	6½	....	8⅛	8½
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1½	1.30	1½	95c	95c	85c	65c	50c
New York	15c	10c	10c	....	....	....	....	....
Northern Belle	19	17	20	19	19½	....	19½	13⅜
North Noonday	1	60c	90c	50c	50c	....	40c	20c
Navajo	70c	....	60c	....	65c	60c	50c	....
Occidental	1½	1.40	1.40	50c	1.40	....	1.20	1.05
Ophir	8⅛	7½	7⅛	6⅜	6½	5⅜	5⅞	5
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.55	1.40	1½	1.40	1.70	1.55	1.45	1.15
Oro	80c	55c	95c	65c	1.10	95c	90c	70c
Paris	....	....	....	....	....	....	....	....
Potosi	3.65	3.30	3.35	3	3½	2.20	2.55	2.15
Queen Bee	....	....	5c	....	5c	....	....	....
South Bulwer	....	....	35c	....	....	....	35c	....
Savage	3.90	3⅜	3.45	2.95	3	2.45	3	2½
Seg Belcher	8	7	7⅞	7	....	....	....	....
Sierra Nevada	16⅞	14⅜	13½	10½	11½	8⅜	9⅜	6½
Silver Hill	35c	25c	35c	25c	30c	....	25c	20c
Silver King	22	21½	22	21½	22	21½	21⅜	21½
Sucker	....	....	....	....	....	....	....	....
Summit	....	....	25c	....	....	....	30c	25c
Scorpion	2	1.70	1.70	1.30	1½	1.20	1.20	1
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	15c	10c	10c	5c	10c	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	40c	35c	35c	30c	30c	25c	40c	35c
Tioga Con	75c	60c	65c	60c	60c	....	55c	50c
Tiptop	4.95	4	4.05	3.80	4	3.90	4.95	4½
Tuscarora	30c	....	25c	....	....	....	....	....
Union Con	15	12½	12½	9½	12⅝	9	10	8½
Utah	13	10⅜	10⅜	8⅜	8⅜	7	7⅜	5⅜
Ward	....	....	2½	....	2½	....	....	....
Wales	1.60	1½	1½	1.45	1.65	1.60	1½	1
Yellow Jacket	6⅛	5½	5½	4.85	5½	4.60	4.80	4.10

Sales at S. F. Stock Exchange.

Thursday A.M., July 14.

90	Alpha	2½	
75	Andes	1.35@1.40	
565	Alta	4.10@4.15	
25	B & Belcher	3½	
150	Benton	1.00	
380	Belcher	2.85@2.95	
320	Bullion	90@85c	
520	California	80c	
30	Con Virginia	1.90	
10	Choliar	2.10	
325	Crown Point	2.15	
1500	Con Imperial	15c	
80	Curtis	1¼@1.60	
190	Exchequer	1.10@1.15	
30	Golden Gate	2½	
320	Gould & Curry	4.70@4½	
60	Hale & Nor	4.30	
360	Justice	85c	
160	Kentuck	2½	
200	Mexican	7	
50	Ophir	5¾	
500	Overman	1.20	
50	Occidental	1.20	
190	Potosi	2.30@2.35	
545	Savage	2.95@3	
115	Sierra Nevada	8⅝@9	
120	Scorpion	1.15@1.10	
100	Sutro	10c	
100	Silver Hill	20c	
40	Utah	6⅛@6⅜	
60	Union	9½	
330	Yellow Jacket	4.40	

AFTERNOON SESSION.

1105	Albion	3.80@3.70	
100	Arcenta	5c	
100	Belle Isle	25c	
210	Bodie	6¾@6⅝	
310	Bechtel	1.55@1.60	
500	Black Hawk	20@15c	
150	Boston	50c	
100	Champion	15c	
250	Day	2.15	
40	Eureka Con	32	
120	E Mt Diablo	10c	
100	Grand Prize	40c	
200	Head Center	1.20	
600	Holmes	60@35c	
20	Mt Diablo	6¾	
10	Manhattan	2½	
1000	N Belle Is	45@40c	
550	Oro	80c	
200	S Bulwer	35c	
100	Summit	30c	
250	Syndicate	35c	
550	Star	30@25c	
10	Silver King	21½	
10	Tiptop	4.95	
1200	Wales	1	

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

IROQUOIS G. M. Co.—July 11. Location: Tohongo District, Los Angeles county, California. Capital, $10,000,000, in 100,000 shares. Directors—A. Moore, Z. W. Moore, J. Cheny, S. A. Stone and W. S. Lambert.

POLETA G. M. Co.—July 12.—Location: California Capital, $10,000,000. Directors—A. K. P. Harmon, W. E. Dean, W. H. Lent, D. C. Bates and J. H. Boalt.

WESTERN DREDGING AND RECLAMATION Co.—Object: To dredge and reclaim marsh and overflowed lands in this State. Capital, $100,000, in 100 shares. Directors—F. D. Brandon, S. F. Platt, M. W. Bell, F. Warner and J. D. Gray.

TOWER HILL M. Co.—July 13. Location: Nevada. Capital, $10,000,000. Directors—Charles Moss, Wm. H. H. Hart, John C. Beatly, John Ballard and J. C. Fiske.

CARBONATE CON. G. & S. M. Co.—July 13. Location: Arizona, Montana, Utah and Idaho. Capital, $10,000,000. Directors—Wm. Anderson, George R Woods, Wm. G. Woods, L. H. Nichols and W. E. Rothrick.

DURING the month of June, the Manhattan mill reduced 580 tons of ore assaying $133,213.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda M Co	California	5	10	July 11	Aug 17	Sept 6	T H Dixon	238 Montgomery st
Alpha Con M Co	California	14	1 00	June 20	July 25	Aug 15	W Willis	309 Montgomery st
Argenta M Co	Nevada	8	10	July 7	Aug 11	Sept 2	E M Hall	327 Pine st
Belle Isle M Co	Nevada	2	15	June 3	July 11	Aug 2	E M Hall	327 Pine st
Belvidere M Co	California	11	25	May 27	June 30	July 16	C V Hubbard	310 Pine st
Best & Belcher M Co	Nevada	21	50	July 12	Aug 16	Sept 7	W Willis	309 Montgomery st
Caledonia M Co	Nevada	36	25	July 7	Aug 11	Aug 31	R Wegener	414 California st
California M Co	Washoe	1	30	June 30	Aug 6	Aug 25	C P Gordon	309 Montgomery st
Con Pacific M Co	California	3	40	July 9	Aug 1	Sept 1	F E Luty	330 Pine st
Equator M Co	Nevada	4	25	June 7	July 12	Aug 3	W Willis	309 Montgomery st
Grand Prize M Co	Nevada	5	25	May 27	June 30	July 20	E M Hale	327 Pine st
Hale & Norcross S M Co	Nevada	70	50	July 12	Aug 16	Sept 7	J F Lightner	309 Montgomery st
Mexican G & S M Co	Nevada	16	1 00	June 26	Aug 2	Aug 22	C L McCoy	309 Montgomery st
Maybelle Con M Co	California	8	20	June 22	July 29	Aug 22	W J Taylor	310 Pine st
Martin White M Co	Nevada	10	25	June 18	July 30	Aug 25	H L Scoville	309 Montgomery st
Murchie M Co	California	6	15	June 10	July 11	Aug 10	S D Rogers	328 Montgomery st
Oro M Co	California	8	10	June 1	July 5	July 24	W Stuart	320 Sansome st
Phœnix M Co	Nevada	23	10	May 9	June 15	July 9	H Loeter	308 California

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona Mexican M Co	Arizona	1	50	June 7	July 15	Aug 8	G R Adams	320 Sansome st
Betty O'Neal M Co	Nevada	1	50	June 14	July 19	Aug 9	R W Heath	318 Pine st
Con M Dorado M Co	Nevada	2	10	June 27	Aug 12	Aug 18	J M Buffington	339 California st
Eintracht Grav M Co	California	7	5	June 14	July 21	Aug 9	H Kunz	209 Sansome st
Fresno Enterprise M Co	California	1	15	June 1	July 1	Aug 1	W H Allen	306 Pine st
Golden Gate Cou M Co	California	4	50	May 19	June 30	July 21	J T McGeoghegau	318 Pine st
Harrington M Co	California	2	5	June 15	July 20	Aug 11	I C Miller	409 California st
Homes M Co	Nevada	2	10	June 22	July 25	Aug 15	E A Holmes	318 Pine st
Iron Clad Con M Co	California	1	1½	May 25	July 10	Aug 10	A Dott	309 Montgomery st
McMillen M Co	Arizona	3	20	Jan 12	June 12	July 27	J Morizio	328 Montgomery st
Morgan M Co	California	7	50	July 8	Aug 16	Sept 13	J Raphael	533 Kearny st
Mount Potosi M Co	Nevada	—	10	June 9	July 16	Aug 8	J H Sayre	330 Pine st
Noonday M Co	California	3	50	June 28	Aug 3	Aug 26	Wm J Traylor	310 Pine st
North Noonday M Co	California	3	50	June 28	Aug 5	Aug 29	Wm J Traylor	310 Pine st
Oakland G M Co	California	15	06	May 3	July 2	July 19	R D Hopkins	436 Montgomery st
Paris M Co	California	2	25	June 22	July 27	Aug 17	W J Taylor	310 Pine st
Occidental Con G M Co	California	7	04	May 9	July 7	Aug 2	W T Smith	414 California st
Paris M Co	California	2	25	June 22	July 27	Aug 17	Wm J Traylor	310 Pine st
Rocky Point M Co	California	3	05	June 21	July 25	Aug 15	W G Hughes	330 Pine st
Red Cloud Con M Co	California	10	20	June 22	July 27	Aug 17	W J Taylor	310 Pine st
Steep Hollow G M Co	California	6	1 50	June 21	July 26	Aug 18	J W Pew	310 Pine st
Spaulding G & S M Co	California	2	10	June 28	Aug 23	Sept 15	J W Pew	310 Pine st
Swamp Angel G M Co	California	4	12½	June 14	July 16	Aug 4	L Little	607 Washington st
Three Brothers S M Co	Arizona	1	30	May 25	June 28	July 20	C Meade	324 Pine st
Union Con M Co	Nevada	17	1 00	July 1	Aug 4	Aug 24	J M Buffington	329 California st
Utah S M Co	Nevada	35	2 00	June 28	Aug 2	Aug 23	G C Pratt	309 Montgomery st
Wolverine Gravel M Co	California	2	10	May 31	July 1	Aug 1	E J Blauding	325 Front st
Wide Awake M Co	Arizona	13	10	June 4	July 18	Aug 10	C Hildebrandt	Cor Bush & Monty

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Benton Con M Co	California	W H Watson	302 Montgomery st	Annual	July 23
Boston Con M Co	California	F E Luty	330 Pine st	Annual	July 16
Golden Gate M Co	Nevada	T Widman	404 Montgomery st	Annual	July 16
Hillside M & M Co	Nevada	N Frankenthal	121 Battery st	Annual	July 27
Justice M Co	Nevada	T Widman	404 Montgomery st	Annual	July 18
Lady Washington M Co	Nevada	W H Watson	302 Montgomery st	Annual	July 27
Liguria M Co		A B Cooper		Special	July 25
Mt Pleasant M Co	Nevada	H Lowden	330 Pine st	Special	July 25
Old Judge M Co	Nevada	J E Hill	230 Montgomery st	Annual	July 18
Union Con M Co	Nevada	J M Buffington	309 California st	Annual	July 18
Yellow Jacket M C	Nevada	M Otey	Gold Hill	Annual	July 18

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	July 20
Father De Smet M Co	Dakota	H Dean	New York	50	June 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	July 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	July 15
Silver King M Co	Arizona	J Nash	315 California st	25	July 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	July 12
Western M Co	California	C S Curtiss	309 Montgomery st	75	May 12

The Mining Share Market.

Mining stocks are off again, the market being decidedly sick. Assessments to fall delinquent in July amount to $570,900, of which Nevada mines call for $227,500; California, $318,400; Utah, $15,000, and Arizona $10,000. In July, 1880, the delinquent assessments amounted to $961,000. Thus far this year Nevada mines have called for $3,473,460 to keep the hall rolling, of which Storey county wants $2,675,150. During the first seven months of 1881, the assessments have amounted to $5,157,260, against $7,958,500 during the same time in 1880, and $8,714,300 in 1879.

The recently levied assessments (and the expectation of others to follow), though naturally to be expected and universally recognized as a necessity, have apparently caused an alarm among small dealers, which, in a measure, accounts for the very weak state of the stock market. As an additional cause, the reports of the expected and present trouble from water by no means tends to encourage stockholders, and their belief of a month ago that a big "boom" was near at hand has oozed out at their fingers' ends—and the marrow of their financial backbone has apparently gone the same way.

There is certainly, says the Gold Hill *News*, nothing very encouraging from the north end. The crosscuts are run as usual in Sierra Nevada. The water gives some trouble in Union.

The machinery at the C. & C. shaft, through which the Bonanza mines are worked, is in thorough repair, and will stand a long siege of work.

The C. N. S. hydraulic pump will start up for permanent work before the end of the week—which looks encouraging for holders in the middle mines.

The Yellow Jacket is the center of attraction of the Gold Hill group just now. The quartz found by the Sutro tunnel drift is liable to prove interesting.

COMSTOCK prospectors have recently visited the Walker River region, and report finding some very promising veins of gold-bearing quartz. Did the same report come from an almost inaccessible region, there would be an instantaneous rush in that direction, but when it is close at hand the country is not considered worth prospecting. Old prospectors must always encounter hardships and perils before they can be brought to think well of a location. So says the Gold Hill *News*, and there is more truth than poetry in the assertion.

THE Ophir works at Virginia caught fire on the 12th, but very little damage was done.

The Mining Bureau.

Mr. Hanks, the State Mineralogist, has received this week a specimen of Priceite, a very rare and interesting mineral. It is a horate of lime, named after Prof. Price, of this city. The specimen came from Curry county, Oregon, which is the only place in the world whore it occurs, except, we believe, one locality in Nova Scotja.

The Mining Bureau has also received from the southern part of this State a specimen of cnproscheelite, which is another very rare mineral.

Among other things received by the Bureau lately is a curious piece of pig iron from Oregon. It is in the shape of a little pig or shoat, and is from the first castings of Oregon iron. The Bureau has now a piece of the first har ever cast in Oregon, and also the first har ever cast in this State.

The Bureau is now in its new quarters on Sutter street, but work on the building is going on so that the collection is not in a condition to be examined. Mr. Hanks has his office in one of the front rooms, but the large room where the collection will be displayed is not finished. The Bureau will have its own private entrance, and the rooms will be conveniently arranged for musenm, office, lihrary, lahoratory, store-room, etc.

The collection is being constantly added to, and before long will he the finest in the country. Mr. Hanks is indefatigable in his search for rare and valuable specimens, and continues to secure large numhers for the State.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Algonqnin (Montana), July 3d, $5,500; 7th, $7,000; Buffalo (Idaho), 10th, $3,000; War Eagle (Idaho), 10th, $17,128; Silver King (Arizona), 7th, $24,043; Sunpatic, 6th, $4,730.83; Western, 5th, $11,020.09; Sierra Nevada, 6th, $27,558.04; Standard Con., 3d, $18,358.76; Northern Belle, $5 549.25; 9th, $8,278.33; Navsjo, 12th, $5.500; Mt. Diahlo, 8th, $6,938.73; Christy, 5th, $4,379; Germania, 5th, $2,300; Hanauer, 5th, $1,700; Horn Silver, 5th, $10,000; Ontario, 5th, $4,324; Ontario, 2d, $5,358; 3d, $5,434; 4th, $8,808; 6th, $9,607; Mammoth, 3d, $3,000; Germania, 6th, $2,320; Mayflower, 6th, $5,150; Hanauer, 6th, $1,720; Bullion, 6th, $8,850; Pasco, 6th, $1,300; Ontario, 7th, $11,940; Hanauer, 7th, $1,750; Christy, 7th, $1,170; Ontario, 9th, $10,780; Pascoe, 9th, $1,360; Hanauer, 9th, $1,720; Mayflower, 9th, $4,280; Bullion, 9th, $4,240; Head Center, 10th, $5,090; Mt. Diahlo, 7th, $6,938.73; Northern Belle, 11th, $7,100; Eureka Con., 7th, $7,643.34.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

CALAVERAS.

NEW GIANT.—Calaveras *Chronicle*, July 9: The Calaveras W. and M. Co. have had built for them one of Hoskins Bros.' latest improved giants (top roller instead of bottom), 9-inch butt, capable of throwing 1,000 inches of water. They have it in operation on their North Hill claim, and it is doing big work. They expect to have 3 more of these at work on their claim the coming season.

GLENCOE DISTRICT.—The Mexican is an ancient locatiou. Mexicans were the original owners. The ore they taken from the vein was from 6 inches to 2½ ft in width, producing from $60 to $115 per ton. Several years ago the present owners purchased the mine, and developed it since then with profitable results. Four different ore chimneys have been exposed with but little dead grouud (supposed to be) intervening, covering a linear distauce of some 1,100 ft. Three of the chimneys have been exhausted to water level, the deepest shaft being 115 ft. All the lower levels denoted an improvement in quantity and quality of the ore. The entire extent of the ore body now being opened has not been ascertained, but is 80 ft in length so far.

VANDERBILT MOUNTAIN.—*Echo*: The proprietors of the Vanderbilt mine have sunk a new shaft 75 ft deep, and are now drifting south toward the old shaft. They expect to strike the main ore body in about 18 ft. The vein is over 5 ft wide and prospects well. As work progresses on the Confidence mine, the vein widens and the ore increases in richness. We were showu several large pieces of ore taken out a few days since at a depth of not more than 45 ft, which we are quite sure will pay from $500 to $800 per ton.

EL DORADO.

RICH STRIKE IN THE ROSE MINE.—*Mountain Democrat*, July 8: The Rose Quartz G. M. Co. have been running a crosscut on the 140 level, from the main hoisting shaft west, to cut a body of ore that prospected well ou the surface. This week they reached what is supposed to be the foot-wall, at a distauce of 80 ft from the shaft. Before reaching the foot-wall they passed through a vein of ore that prospected well in five gold and is fully 6 ft wide. So far as can be determined by the appearance of the vein as it lies against the foot-wall, it is reasonably safe to assume that the recent development will place the Rose mine on a substantial hasis for further operations.

THE Grand Victory mine has changed hands, having been sold by the former owuers at a fair advance on their investment. The new company will commence operations on Monday uext.

MINE SALES.—El Dorado *Republican*, July 7: We hear of several transfers of mining property during the week, though we are not possessed of sufficient facts, in most cases, to more than announce sales. Large money is named in connection with some of the transactions. The Kimball comes first. It has been sold conditionally, so much money to be paid in a specified time, or money advanced to be forfeited. Mine stands idle in interim. Senator Jones is named in connection with the transaction. The price to be paid we do not get definitely, but know that less than $80,000 would not make sufficient impression to cause operations to cease even for a fortnight. The Mt. Pleasant has again beeu sold to parties who intend to push development with a view to making the most out of it in the shortest possible time. We do not hear the purchase price definitely named, but half a million is so often and promiscuously mentioned in connection with the last deal, that we conclude that that must be about the price for which the mine sold, and we believe that 10 months square work, with a 20-stamp mill, would pay that amount, were the mine worked to the best advantago. The Stillwagon mine, Cosumnes township, a mine scarcely developed, but one which has paid largely for the amount ot work done upou it, has been purchased by Sam Laue, a practical miuer, and he proposes to open it out in good shape at once. The siuking of a 200-ft shaft will be the first work inaugurated. The Meltons, we learn, have disposed of one of their mines, near Grizzly flat, and that machinery is to be put upon it directly. The air is full of rumors of sales of mining property, but as we are unable to get the facts authentically, forbear making further mention.

SR. LAWRENCE.—Georgetown *Gazette*, July 8: The works on the St. Lawrence mine, Kelsey district, were burned last Wednesday. The mine belongs to Messrs Mierson & Alderson, of Placerville, and has been idle for some time. The loss willl amount to a few thousand dollars.

ITEMS.—From A. W. Martin, who was in town to-day, we gathered the following concerning some of the Greenwood mines: The famous Cedarhurg, owned by E. W. Hulford, is expected to be started up some time this fall. The North Extension, owued by Dr. Martin & Co., has been prospected this summer quite extensively by drifts and shafts, showing a number of good seams, which will he worked by drifting after some hydraulicking is done, which last work they are preparing to enter upon this fall. North of this mine is another extensiou of the Cedarburg, owned by Morrell & Peterson, who are doing some extensive drifting, and also expect to begin piping when the rainy season sets in. We learn that the hoisting and pumping works of the Cashier mine, Jas. Morgan, Supt., at Georgia Slide, came near being destroyed by fire one day this week. The awning took fire from the friction of the wheel. Work at crosscutting from the shaft to the ledge on the third level of the Eureka is going ahead nicely. Supt. Check thinks the ledge will be reached by July 20th. Ballard & Hotchkiss have commenced running a tunnel to tap their ledge adjoining Smeder & Forni's claim on the south, near the big flumes of the Cal. W. & M. Co., east of town.

INYO.

TO BE ABANDONED.—Inyo *Independent*, July 9: The Resting Spring mines, located in the southeastern corner of this county, are to be abandoned. A few days since some of the owuers of those mines were sent out from Los Angeles with instructions to clean up the amalgam to date, sell the mill, discharge the men and abandon work.

AT DEEP SPRINGS.—Jas. E., the junior of this paper, accompanied Messrs. Griswold & Todd on their tour of inspection of the mining properties and chances over at Deep Springs, starting Sunday last. Mr. Hedge came in last Thursday, and reports the party well pleased with the outlook in general, but intending to remain several days yet so as to see it all as near as may he before returning.

THE KEARSARGE.—Recent developments in the deepest workings (some 600 ft under ground) of the Kearsarge are of such an encouraging character as to warrant us in saying that active work will, ere long, be inaugurated on the deep or "big" tunnel, by which alone can the real value of the famous old mine be satisfactorily determined.

BULLION SHIPMENT.—June 29th, the O. L. M. & M. Co. shipped one bar of bullion, weighing 62½ lbs, valued at $1,300. The mill at Keeler is now shut down and hands discharged, but it is not the intention to permit this state of affairs to continue hut a few weeks at most. The mill is, we believe, one of the very best in the State, and, up to date, has made a splendid and paying record, with J. H. Holt in direct charge, and Capt. Keeler for general manager.

MARIPOSA.

HORNITOS MINES.—Mariposa *Gazette*, July 9: At the No. Nine mine quite a number of miuers are employed, and rock in quantities is being brought to the surface. The mill, which at present is idle, will start up as soon as pipe is laid, which is to conduct water from Bear creek, a source which will afford ample supply for the purposes of the mill the whole year. This property is now owned by a Mr. Huling. Frank Thorn is made the Supt., who, with other native practical assistants will, without doubt, soon

be able to reclaim for the No. Nine its more brilliant laurels, which under a late management have become slightly clouded.

ENTERPRISE MINE.—This mine, which is principally owned by R. W. Barcroft, of Hornitos, has resumed work, placing upon the dump quantities of pay ore.

WASHINGTON MINE.—At this mine an air compressor is being constructed and machinery for the purpose of driving a Burleigh drill a sufficient distance into the bowels of the earth, to expose a large body of rich ore said to exist below the 1,400 level. The great depth of this mine ought to be a sufficient guarantee to other owners of mines in the same neighborhood to sink down upon their mines as far as indications of pay ore extend.

MONO.

BODIE.—*Free Press*, July 12: The most cheerful piece of news which has been heard in Bodie for some time, is the fact that the new pump column at the Red Cloud shaft is now in position and that pumping has been resumed. Shortly work will again be in progress in the bottom and in the crosscut started at the 600-ft level for the Concordia. We would not be surprised, from a pretty familiar knowledge of the Red Cloud ground in the 250 and 400 levels, to learn of a development in the territory of that company as well as in that of the Concordia. The ore is said to be showing up splendidly on the 520 level—in fact the mine is now looking finer than at any previous time in its history. The Addenda also is exposing some very rich ore. Work on the proposed new mill for the Bodie Tunnel and Mining Co. will at once be commenced. James M. Dawley, formerly of the Standard, having arrived to take charge of it. A Howland pulverizer will be used, of a capacity equal to that of 20 stamps. The Bechtel is running steadily and satisfactorily the 40 stamps of the Noondays. About 85 tons per day are run through. The Lent shaft is getting down toward a point where it will be interesting.

NEVADA.

CENTENNIAL MINE.—Grass Valley *Union*, July 11: A recent crushing of 22 loads of rock from the north drift of the 400 level of the Centennial mine paid $40 per load, not including sulphurets. This is a better result than was anticipated, as the good rock on that level has heretofore come from the south drift.

RICH SPECIMEN ROCK.—The Ford & Mullen claim, on New York hill, continues to turn out the rich specimen rock for which the mine has been noted for several years past, an evidence that the rich chute in the vein is by no means exhausted. The rock is so rich that it is gathered up in boxes and stored away so that it can be run through the mill at a stated time. There is now in the vault at Judd's store, Boston ravine, 27 boxes of this rock, amounting to about one ton in weight, the value of which it is difficult to guess at, but estimates run all the way from $12,000 to $15,000. Many of the pieces contained in the boxes have bands of almost solid gold running through them, some of the bands being between one and two inches in width. The gold is heavy, and of a quality that will count up rapidly in value. There are also a few specimens that show leaf gold projecting from the quartz. These are very handsome, but of course not so valuable as the solid granular looking specimens. The "rich streak" in the mine has continued to produce this remarkable ore, off and on, for several years, until miners have come to call the Ford & Mullen "the greatest little gold mine in America," as in every little while it turns out these bonanzas, to the surprise of the owners and the public.

SAN DIEGO.

PINACATE MINES.—San Diego *News*, July 8: The Pinacate mines are located in the northern part of the county, in the region of the county known as the San Jacinto, distant from San Diego say 75 miles. The district seems to be developing into rich mines, and recent discoveries there outside of the mines already being worked, indicate that there are yet finds in the district. We have examined some rich ore from that district, and from the Lucky Cuss mine, belonging to Messrs. Pancho Estudillo and a gentleman by the name of Waters, now in this city, that looks very rich indeed. There is one large piece of quartz, weighing perhaps 5 lbs., glistening with the precious particles, and several small pieces that are much richer, apparently. We believe the owners have a good thing in the Lucky Cuss, and that others will do as well.

SHASTA.

DEADWOOD ITEMS.—Cor. Shasta *Courier*, July 9: Greavis & Lambreth, owners of the Black Bear mine at this place, are erecting a 10-stamp mill. A good road has recently been finished from Lewiston to this and also the Frick & Davis mine. Frick & Davis are working in good rock, their ledge, though narrow, is paying well. The Gibson Bros.' mine is improving as they go down. The main shaft is down a distance of 40 ft, and the ledge at this depth gives every indication of permanency. The McDonald Bros. recently discovered a ledge about 8 inches thick. It is reported as very rich in free gold. Work on Shafter's mine is being vigorously prosecuted and is paying well.

SIERRA.

GOOD MINE.—*Mountain Messenger*, July 9: From all appearances the Black Jack mine, in Jim Crow canyon, is destined to be a first-class property. From a crushing made there a yield of over $15 per ton was had, and the sulphurets saved yielded as much more. Should the ledge continue to widen as it goes down, of which there is every indication, it will soon be upon a paying basis, and take a prominent place among quartz mines.

MINERS' UNION.—A Minors' Union has been organized at Forest city, with a large number of names upon its roll. Just what the especial object of this Union is we have no means of knowing, as it is reported to have no connection with any other Union, but is a law unto itself, being a secret organization. We suppose its object is to establish the price at which miners may work. We understand that no one is allowed to know its objects until he joins the organization.

NEW SHAFT.—The new shaft at the Bunker Hill claim, beyond Saddle Back, has been completed, and gravel will be taken out in a few days. M. McFarland, one of the owners, carried over 100 ozs. of gold to Downieville two months ago. Bad air has stopped work to the present time. This has been a trouble for years. A tunnel of main tunnel, 2,000 ft; depth of shaft, 240 ft. Twelve men are employed. The original stockholders are working the claim and doing well.

TRINITY.

A NICE NUGGET.—Trinity *Journal*, July 9: Mr. J. R. Flagg, foreman in the Ward mine on Gregon gulch mountain, this week showed us a piece of solid gold weighing $65.75, which was picked up in the mine the other day, and being the largest ever found there.

TUOLUMNE.

A GIGANTIC MINING ENTERPRISE.—Cor. Tuolumne *Independent*, July 9: There is in contemplation a mining project which will, if carried out, eclipse any mining enterprise of the kind in the past history of the county. It is proposed to mine out the bed of the main Stanislaus river from the junction of the south fork, a distance of ½ mile below. Also, the south fork from its junction with the main, a distance of ½ of a mile or more, will be mined. To effect the object a large flume will be constructed, ¾ of a mile in length, with a capacity sufficient to carry the waters of both streams—or, in other words, what they ford in the summer season; then, by throwing a dam across the streams, the water will be turned into the flume, thereby draining the bed of the river where it is proposed to mine it out. Parties representing capital have been down to the river, at the points named, and made a thorough examination of the locality, and think favorably of engaging in the undertaking. There will evidently be large bodies of immense rich auriferous sands and gravel found in the river-bed after the waters are turned out. It is to be hoped the enterprise will be carried out, and, in the end, prove a financial success. We are quite familiar with this locality, and have some little knowledge of the richness of the gulches that discharge into it, and the slopes along the river at either side, which were worked in early days, and were made available at trifling outlay. After a careful consideration of all the advantages and disadvantages, we see no reason why it cannot, if the operation is properly conducted, be made profitable to the investors.

NEVADA.

WASHOE DISTRICT.

ALTA.—*Enterprise*, July 9: During the greater part of last week we have been engaged in putting in pumps. The 1850 pump will be started up to-night. Depth at shaft, 2 116 f'.

SIERRA NEVADA.—On the 2500 level the joint east winze has been sunk and timbered 6 ft. Crosscut No. 1 has been advanced 30 ft, and No. 2 was extended 20 ft. On the 1900 level a large force is engaged in removing air pipe to the surface. During the week have raised 100 tons of ore.

UNION CO.—On the 2500 level the joint Sierra Nevada winze has been sunk and timbered 6 ft.

OPHIR.—On the 2500 level the joint Mexican east winze has been sunk and timbered 7 ft.

UTAH.—The incline has been sunk and timbered 15 ft. The ground in the bottom is somewhat harder. The north drift on the 400 level has been extended 50 ft.

UNION SHAFT.—Are cutting out station and pump foundation at the 2700 level, and casing timbers on the 1900, 2200, 2400 and 2500 stations, and repairing the surface machinery.

MEXICAN.—On the 2500 level the joint Ophir east winze has been sunk and timbered 7 ft.

YELLOW JACKET.—East drift, 3000 level, has been advanced 51 ft during the past week, making the present length of same 116 ft from the shaft. Ground continues dry and hard. On the 2800 level, are still employed cutting out for a chute on west side of winze. The water in mine continues same as last report. About 50 ft north of our south line the Sutro tunnel has cut quartz with a strike east of north and south of west with a dip to the northwest, which gives low assays, evidently a feeder to our ledge.

NEW WELLS-FARGO.—All the water is now out of the shaft and drifts of the lower level. The shaft has been repaired and is now in good working condition. The sump has also been cleaned out to a depth of 15 ft. which gives sufficient space for holding water from 7 to 8 hours without hailing, thus leaving us in a good condition to go on and develop the mine. After draining the water from the drifts, we find that they are badly caved from the action of the water, the flow of which has now diminished from 100,000 gallons per 24 hours to 7,000 gallons per 24 hours. After making a thorough examination of the formation we are led to believe that the dip of the vein is to the west, which is characteristic of all the surface bodies found on the Comstock at this depth. We are now starting a drift to the west, from the bottom of the shaft, in a very encouraging looking formation.

GOULD & CURRY AND BEST & BELCHER SHAFT.—The shaft has been sunk and timbered 20 ft; total depth, 2,055 ft.

CON. IMPERIAL.—We are pushing operations vigorously on the 2,000, 2,600 and 2,800 levels, the latter level having cooled off sufficiently the past week to allow of men working at that point.

CALEDONIA.—Our pumps have been run an average of 9¾ hours per day, consuming 4 3-7 cords of wood per day.

OVERMAN.—We have extended the drift on the 2,275 level 40 ft, and put in 6 sets of timbers in the east drift. The ground in the face of the drift requires close timbering.

SUTRO TUNNEL.—Additional to the usual repairing along the main line, a shift of men has been employed most of the week cutting extra sills under the track near the 17,100 point; also, some ground has been retimbered at point 3,100 ft. The face of the south header is now 15.77 from the north line of the Kentuck claim. Nature of ground in the face, hard; character of rock in the face, andesite; number of ft last report, 4,023; driven since, 65; total, 4,088 ft. The flow of water from the tunnel for 24 hours is equal to 4,769,280 gallons.

BALD MOUNTAIN DISTRICT.

COPPER GRE.—Eureka *Sentinel*, July 11: Bald mountain, White Pine county, is rich in both silver and copper ores. There has never been any large amount of capital expended in the development of the mines of that section. From all accounts there is no better field anywhere for the profitable employment of capital. Copper mines are ready sale in the East at good figures. If the Bald mountain mines are as good as represented, it ought not to be a difficult task to enlist purchasers for them. Some of the specimens left with the *Sentinel* will be expressed to parties who operate copper mines, with a view to getting them sufficiently interested to come out and take a look at the Bald Mountain section.

ESMERALDA DISTRICT.

PROGRESS AND DOINGS.—Esmeralda *Herald*, July 9: In a quiet way things are assuming a better look for the future than outward appearances would seem to indicate. Eastern men have for some time been investing in mines here, without making the usual parade of their purchases that is customary with capitalists on this coast. There are now 3 or 4 Eastern companies who own mines in this district. The Cortez is one of the mines owned by New York men, and the development of this property is flattering indeed, and highly satisfactory to them, as it is proving to be one of the finest pieces of mining property in Nevada. The Seminole is also owned by parties in New York, whose intention it is to shortly commence operations, two of the interested parties having thoroughly examined the property during the past week, and were highly pleased with it. A portion of the Humboldt West will shortly change hands at round figures. This mine is opening up handsomely, every stroke of the pick showing the finest kind of ore. The Silver Lioing gives flattering results for the amount of work done. The Rothchild has a fine ledge from which $50 ore is being extracted. The Centennial, as work progresses, still holds its reputation as a fine bullion producer. In fact, wherever work has been done in the camp the most gratifying results have followed.

THE HUMBOLDT WEST.—The south drift on the east wall has been advanced during the week 14 ft. The ledge continues to show the uniformity in value. The mine is certainly developing well, and has now not less than 75,000 tons of good milling ore uncovered.

SILVER LINING.—Some ore has been taken from this ledge during the week, only a few ft below the surface, that assayed in gold $120 and $14 in silver, making the total value per ton $134.

THE ROTHCHILD.—The west drift on the 50 level is now in 30 ft on the ledge. The average quality of ore taken out in running the drift is $50 per ton.

CORTEZ.—We visited this now, beyond a doubt, wonderful mine last Wednesday and were surprised to see the amount of ore on the dump that had been extracted in sinking and drifting on the ledge, to say nothing of 2,000 or 3,000 tons of the same kind of ore that has been developed by the drifts and the incline. There are two ore dumps, one for the first and one for the second-grade ore. Of the first grade there is over 200 tons, while the other dump is variously estimated to contain 80 to 100 tons. A very rich strike was made in the west drift this week. The rock is literally covered with gold, which can be plainly seen with the naked eye.

GRANTSVILLE DISTRICT.

THE ALEXANDER.—*Bonanza*, July 9: The portions of the mine now being worked on present a marked improvement during the week ending this date. The ore body in north end of No. 5 is producing about 25 tons per day, which is improving in quality as the body is being opened up. This body is now developed in length over 600 ft, and the ore is fully 50 ft in width where we are working in No. 5. The raise started on west side of incline to connect with No. 5 ore body is up 30 ft from No. 0, in ore all the way.

THE BROOKLYN.—In the Brooklyn the crosscut south from No. 3 level is showing some very rich bunches of antimonial silver. The stopes on Nos. 1 and 2 levels are producing their usual amount of ore.

THE ALEXANDER MILL.—The mill is running along nicely and working the company's ores to over 80% of their assay value.

REBEL CREEK DISTRICT.

THE ROCK CREEK MINES.—*Silver State*, July 9: Last week an item appeared in the *Silver State* relative to the Rock creek mines, discovered recently by the French boys. Since then we have received a note from the owners, Sarach, Wells & Co., who say they have named the 2 ledges discovered by them the French Flag and Silver Hill Con. They say they have had an average of the main ore streak, which is 4 ft wide, assayed, with the following results: No. 1, red ore—silver per ton, $67 54. No. 2, reddish ore—silver per ton, $31.42. No. 3, iron ore—silver per ton, $26.70. One assay of ore from the hanging wall yielded $131.35 in silver per ton. The ledge is 22½ ft wide. A drift has been run on the lead a distance of 90 ft, and two crosscuts show the vein to be 22½ ft wide, as stated. The mines are situated in Rebel Creek district, about 10 miles south of Willow Creek station, and 40 miles north of Winnemucca.

ARIZONA.

THE MONARCH OF THE SEA.—Pinal *Drill*, July 9: The location of this mine is 150 ft northeast of the famous Silver King, and adjoining the Northern King. It has 2 tunnels, one 35 ft and one 45 ft into the hill, both on the ledge. The vein is from 2 to 4 ft wide, in syenite and granite formation, and carries carbonate, chloride, black sulphurets, galena, white quartz, brittle and native silver, and assays from $50 to $3,000. Some of the ore was shipped to San Francisco and produced from $800 to $900 in bullion per ton, and there has been a test mill run at the Miami mill at Globe of about 5 tons, which netted $500 per ton.

PINAL CON. M. CO.—The property of this company consists of the Silver Bell quartz and the Columbia mines. The company is organized in San Francisco. The trustees and purchasers of the mines are Messrs. Henry Donnelly, ex-superintendent of the Eureka Con., Henry Linkton, F. Locan, S. Hart & H. H. Noble. These gentlemen are all capitalists and mining men. They have surveyed and located a wagon road from the mines to the Gila river, a distance of about 9 miles. An excellent road can be made for about $10,000 to the mill site on the Gila. Work on this road will begin about the 1st to the 15th of August, and the development of the mines will then commence, and, as soon as sufficiently opened, smelters will be erected on the Gila river, where there is an abundant supply of willow and cottonwood, which is the best kind of timber for smelting purposes. The capacity of the furnace will be 50 tons. The company will also buy silver ores from the surrounding mines.

THE KING MINE.—There is 6,000 to 8,000 tons of ore on the dumps, as much as they can work in half a year, and the ore in the mine lays there in masses ready to hoist up. The mill is running full force. We went through the mine on Wednesday last, they are now about 100 ft below the lowest level.

GOLD.—Tucson *Journal*, July 10: We had the pleasure of a friendly visit yesterday from Mr. Wm. C. Grosso, a young gentleman formerly of Oakland, Cal., but now and for some time past a resident of Phenix, in this Territory. He exhibited some beautiful specimens of fine gold, taken from the Burchett and Benbrook mines by him. A clean-up of 25 tons of ore last month gave about $2,500 in fine gold. The property is opened by shaft about 90 ft; the ledge is narrow but very rich. This mine is located in the Tonto Basin country, and is the property of Burchett, Benbrook, Robbins & Grosso. Mr. G. informs us that some 20 arastras are being worked there, and considerable gold being taken out. This is the best gold mining section of Arizona. This section of the Pioneer district is exclusively gold bearing.

CABABI DISTRICT.—Arizona *Journal*, July 5: Mr. David Armstrong, a pioneer prospector and manager of a company composed of St. Louis capitalists, returned yesterday from Cababi district, where he has 35 men employed on the Dominion, Gohir and Third Term mines. From him we learn the following: There is a combination shaft being put down on the Dominion and Ophir, which has reached a depth of 100 ft. At the bottom of the shaft the vein is 9 ft wide, well defined walls. Seven ft of this vein is ore, which will average $90 per ton. There is now 200 tons of ore on the dump. Night and day shifts are being run also, on the Third Term Mine shaft, which is now down 100 ft. The bottom shows a 4 ft vein, between well defined walls. Water has been encountered in considerable quantity. Mr. Armstrong says the Papago Indians came from far and near to get the water, the supply being greater than at any point in that section. These mines are situated in Pima county, 65 miles from Tucson, in what is known as the Papago country. The elevation is 6,400 ft above the level of the sea. These mines were located by Mr. Armstrong two and a half years ago, and have been worked by him up to six weeks ago, in conjunction with H. B. Jenks, when James Edwards and D. S. Foster, of St. Louis, became interested.

COLORADO.

GENEVA DISTRICT.—Georgetown *Courier*, July 7: Since the failure of the Geneva Con. Co. last spring, mining matters have been more quiet than usual in Geneva district, but since the snow disappeared more life has been shown. J. B. Cleveland is developing the Girard and Grand Trunk lodes by sinking on the latter and running a tunnel for the former. He is also running a large tunnel for the Treasure Vault lode, which will be 3,000 ft long when that lode is reached. The Treasure Vault and its extension, the Olen Dale, is one of the largest lodes in the district. The A. B. Sill lode, owned by Capt. McGuire, Capt. Hinkle and Harry Warren, carries a galena ore vein 3 ft wide, not wholly solid, which gives mill-runs of 800 ounces of silver to the ton. The Mary Ann, owned by Thos. W. Jones, of this place, is opened by a crosscut tunnel from which a drift 60 ft long has been driven on the lode. This drift shows a continuous vein of galena ore 18 inches wide. Considerable prospecting is going on. Two nice looking lodes have lately been struck near the Mary Ann, by Berry & Sullivan. Both carry good ore veins, one being bismuth and the other lead.

ATLANTIC DISTRICT.—There are quite a number of prospectors at work in Atlantic district, and many new strikes have lately been made that give promise of becoming valuable mines. The Harder Bros., on Stanley mountain, have sunk a shaft to a depth of 90 ft, which shows a 3-ft crevice and a 5-inch vein of excellent ore. The Homestake, on the same mountain, owned by Shepard & Arnold, shows a 10-ft crevice that carries an ore vein from 12 to 15 inches thick, from which mill-runs of over 300 ounces of silver to the ton have been obtained. A short distance below the Pleasant Hill is the Banker, a parallel lode owned by H. M. Cline & Co., which has been opened at 3 places about 100 ft apart. The crevice is 10 to 12 ft wide, and carries a large quantity of scattered ore and silver glance, a sample assay of the quartz running 276 ounces.

IDAHO.

SQUAW CREEK.—Yankee Fork *Herald*, July 7: A large smelter has been purchased for the mines under the supervision of J. D. Murphy. It will be running early in the fall, and, as the ores in that district are plentiful and rich, another town of considerable importance will spring up on the Salmon. Already two town sites have been located—one 2 miles above the mouth of the creek and the other at the mouth.

THE OEN. MILES AND SILVER BELL.—Geo. Morton is getting everything in readiness for the work on the tunnel of the above-named locations. A smith shop is nearly completed, and other improvements will be added for the comfort and convenience of the workmen. The tunnel is already in a distance of 100 ft, and at that point a ledge of black and brown quartz appears, but the width is as yet unknown. The principal vein lies about 75 ft farther up the hill. The outcrop is all of 125 ft in width, and from 10 to 25 ft in bight, of solid ore, that assays from $40 to $50 per ton. These mines are on the south slope of Mt. Custer and immediately below the celebrated Sunmit.

YANKEE FORK MINE.—*Herald*, July 7: Last Sunday we paid a visit to the placer claims of the above-named company, on the Salmon, where we found the giant at work tearing down the large bed of gravel. The waters of the Yankee Fork afford an abundant supply for hydraulic works on the most extensive scale, there being 10,000 inches available for the purpose. There is about 1,000 acres of ground on the high gravel bars between the mouth of the Yankee Fork and Thompson's creek, 12 miles below, which is owned by the company. The average depth of the gravel is about 60 ft, which prospects from the bedrock to the surface. It is unusually free from cement or clay, and the average yield is 25 cents per cubic yard, which is high for hydraulic ground. The little giant now in operation is moving and washing 2,000 cubic yards of gravel per day of 24 hours at a total cost of $30, or 1½ cents per cubic yard. Two and one-half miles below the present workings the company owns a very large and fine bar, known commonly as Marsball Crawford's bar. The ground of the bar will average fully 50 cents per cubic yard, to which point the company's superintendent expects to extend the works this season—doubling the capacity by adding a little giant of like capacity with the present one. All these bars have been mined more or less for years after the old-fashioned manner; that is, by shoveling in or drifting, and washing the gravel with a few inches of water during the first weeks of spring, realizing in this way many thousands of dollars in dust. With the improved appliances and larger operations of organized capital under the present company, it seems as if the question of successful and profitable placer mining in Idaho is as good as assured.

WOOD RIVER ITEMS.—*News*, July 9: Pete Chandler, a nephew of the late Zach, is preparing for his mill, which is now between Little Wood river and Bellevue. In fact, 33,000 lbs of it were on freight teams at Little Wood river on Wednesday last. Mr. Chandler represents a strong company and the Scorpion group of mines. The mill will be put up about 4 miles due west of Bellevue. Scorpion gulch heads but a short distance west of Broadford, and empties into Croy's creek at the upper end of Croy's old ranch.

GREENHORN.—Tom Boyce, Ed. Cowell, Dan Doud and John Neil are still delving away with good cheer in the Occidental. The location of this mine is good for cheap working, and if it continues to develop as satisfactorily as present indications promise, it will rank among our best before fall. Its location is upon a feeder of Greenhorn creek, about 2 miles from the toll bridge on Wood River.

ITEMS.—It is only about 55 ft from the Occidental to the Vienna incline, which is also on the same ledge, but, this property now being bonded, is lying idle to await the result of time—"sale or no sale." Almost in a due southerly direction from the Vienna is the Silver Reef, Harry Harley owner. On this property not to exceed $10 worth of work has been done, and still there are 20 or 25 tons of 40-ounce ore on the dump. Many claim that the croppings of the Occidental curve slightly, and upon this theory the Imperial has been worked, disclosing in a 30-ft shaft 2½ ft of 83-ounce ore. Workmen are driving ahead both tunnel and drifting work on the Green Veil. This is an excellent property—a full 3-ft vein streaked through and through with galena, iron-stained quartz and carbonate ore. On the north side of Greenhorn is J. B. Ritchie's Clipper, and 2 men are working in the mine. Miners are also employed in the Lucky Boy and Oreenhorn mines, but the Maud May, an excellent property, is now idle.

LOOKOUT MOUNTAIN.—Wood River *News*, July 9: We are informed that capitalists have been looking over Lookout mountain who will do something in the way of opening up our nearest mines. They have been attracted by the richness of assays which characterize the ore in that locality. Of course Miller, Lusk & Co. have a good mine in the Monday and in the Queen Victoria, and, outside of these two, there has been no development attempted. John Walker is a director in a new company of Boston and Philadelphia men, who have come together as the owners of 7 good locations lying adjoining and between the Monday and Queen Victoria. They were opened up last winter in a superficial manner, but as best the boys could do. Mr. Walker says that when work is once started on these properties it will be pushed vigorously to develop their hidden wealth. The claims consist of those known as the Walker mine, Bellevue No 1, Sadie and an extension thereto, Deadshot, Chicago and Hagerman. The company is to do business under the name of Bellevue Con. M. Co.

SOUTH MOUNTAIN.—Gwyhee *Avalanche*, July 9: The work of the Varkuff Co., at South mountain is progressing most favorably with the best indications. A large amount of fine smelting ore is being taken out that will go 100 ounces or more to the ton. Furnaces are being put in order and concentrators will be put in for working the low grade ores that will not smelt. The company are in need of more men, and 20 good miners can find steady employment at $4 per day. Those who have had experience in base smelting ores are prefered. It is the intention of the company, as expressed by their agents here, to conduct their operations on a business basis. To pay cash for everything they get, have a pay day each month and pay on that day regardless of what the product of the mines may be. They have ample faith in the worth of their property and are determined to make the mines pay on their merits alone.

OREGON.

SUTTON CREEK.—Bedrock *Democrat*, July 7: On Sutton creek all parties at work seem well satisfied with the result of their labors. We understand that the mines owned by Crouter & Co. are paying far in excess of the most sanguine expectations of the owners. They have no hydraulic, but with a ground sluice they take out $2 per hour, and have plenty of water to prosecute work with vigor for 10 hours per day. The quartz ledges are showing up well, and are long this location will attract much attention.

UTAH.

MORRYSVILLE.—Cor. Salt Lake *Tribune*, July 10: The recent strikes in this camp have brought us down a small avalanche of capitalists and experts, the advance guard of what will be here between now and fall. To begin with, the news published in the *Tribune* brought over Jack Oilmer and Professor Jenney "across lots" just in time to learn that through too much waiting, Al Orant, Judge Holderman, Tom Ferguson and others have got 00 days bonds for Chicago parties that enables them to control some of the choicest and best property in camp. Among which I am permitted to mention at present as having been secured from Chicago is the Chattanooga, a five ft ledge of rich silver ore, carrying a small per cent. of copper. The Blue Belle on the east, the Gen. Connor on the west, showing a well defined vein of copper and silver ore, and the Chattanooga No. 2, an extension. This property is all located in Bullion canyon, and whilst the figures are way up in the thousands, the lucky bondholders informed your correspondent that "it is dirt cheap." North of Bullion canyon, one and one-half miles, on what was formerly known as the Copper Belt mountain, now known as the Sonora hill, we have had in addition to the old Copper Belt mine, the deed to which is now held in escrow for the benefit of a Chicago company, the Copper Chief, Sierra Nevada, Hamil and Montreal, on the crest of the hill, all showing true fissure veins of high grade ore. Lower down the hill we have the Sonora, carrying the largest body of ore yet discovered in the camp, with its extensions, the Almana and Sonora No. 2. Immediately adjoining is the Geneva, Eleanora, College, Columbia, Spar, Grow Blade and P. G., all of which were located a few months ago, and from developments made have tended greatly to rouse the camp to renewed vigor, inspire it into confident self-help, and cause us to care less for outside aid. The above named properties are all in one group. The Monte del Rey mine, located on Gold Hill, is rivaling the Deer Trail in its richness, is a very large fissure vein, carrying gold and silver, the former predominating. Over $3,000 has been expended so far in prospecting this property, and arrangements are now being made for further development. Whilst the vein is all in low grade gold ore, it carries pockets of exceedingly rich free gold and horn silver.

Notes on Irrigation.

G. C. Holman, of Lockford, San Joaqnin connty, read an interesting lectnre on the subject of irrigation hefore a union meeting of farmers at Lodi last May. Ws shall give our readers ths parts thereof which seem to us of most general interest:

There ars many inhabited countries where the necessary moisture is deficient. This may bs owing to certain topographic conditions, producing climatic effects, as a deficiency of rainfall, or wbere it is not satisfactorily distribnted; or ths popnlation may hs so rednndant that a larger amonnt of water is required than the usual rainfall, whereby to increase horticultural and agricnltnral prodncts. This deficiency and snpply mnst be fnrnished by artificial and mechanical means. This method, or art, ws term irrigation.

Irrigation, thongh practically new to ns, is at least as old as Mosaic history, that makes Adam the first of irrigators in ths Gardsn of Eden, whers was located a spring, or *cienega*, that watered ths garden. In Enrope, Asia, Africa, South America and Mexico, it is historic, having an existencs of many centuries; and it is still cherished and promoted by soms of the most enlightened nations of ths world. England, France, Italy, Spain, Belginm, Holland and Egypt havs complste systems nnder Governmental control.

Egypt, practically a rainless land, is noted for her fertility and abnndant crops. Yet her aqneous supply comes hundred of miles from the Victoria Nyanza, in eqnatorial Africa, and is applied by artificial means. I well rememher the wonder and interest awakened in my mind in my earliest historic readings, by the descriptions of her immensa irrigation works; of her immense reservoirs, often covering areas of miles in extent; her canals of solid concrets or stone masonry; of the popular interest excited by the annual rise of the Nile; the pageantry, the ceremonies and festivities observed in the opening of the slnices, when a most heantiful virgin was offered as a propitiatory sacrifice to the spirit of ths waters, which were to bless and enrich the land. And Egypt to-day is not less noted for her fertility than in the time of the Pharaohs.

Irrigation in India.

India, whose climate in some respects is analogous to our own, prior to British occnpation had nnmerous canals, fed by the snows of the Himalayas, some of them exceeding 100 miles in length and aggregating thousands of miles, which had heen in use for centnries. And since England has assumed control over that country the government has expended more than $100,000,000 in constructing new works and in repairing those destroyed in internecine wars.

As stated by Capt. R. Baird Smith, an officer of the English Army and of the corps of engineers in India, the main trunk of one of the new canals built under English auspices, is 453 miles in length, and with its four great branches, all navigable like its main trnnk for vessels of great aize, has an aggregate length of 898½ miles. At the head it is 140 ft. wide on the bottom, 170 ft. wide at water snrface, and carries a stream of 10 ft. deep with a cnrrent of 4 miles per hour. The volnme of the water is 6,750 cnbic ft. per second. In addition to its great capacity for irrigation and navigation, it affords extensive water power for driving machinery. And this is ouly one of the many. The effect npon the prosperity of the conntry, even in smaller things, is illnstrated hy the fact that some plantations of trees set along the canal by ths English to gratify the Eastern love of shade, soon repaid them in the sale of timber donhle the ontlay, and timher remaining was estimated at 15 times the cost of planting.

Prohably no part of the vast expenditures of the English government repays so wsll as that upon canals. Retnrns direct and indirect npon some of them ars as much as 36% per annum. Thsir total average is 7.15% per annum. Their effect has heen to reclaim from a semi-harbarons and vagrant life nearly twelve millions of inhabitants, and to make them an industrious, contented people. It affords constant employment for a popnlation of npwards of 200 to 500 to the square mile, and in seasons of great drouth relisves them from the dangers of famine, with which they were formerly visited. Products which cannot be estimated at less than $50,000,000 in that conntry of low prices, is placed hsyond the contingencies of season, andpnhlic rsvenues amounting to $15,000,000 annually, is permanently protected from fluctuations in ordinary times and from annihilations dnring extraordinary ones.

Irrigation in Italy.

Canals have had an existence of centnries in Italy, where the system is more generally applied than elsewhere, and is thoroughly appreciated althongh the annual rainfall there eqnals that of the Atlantic States, and two-thirds of it falls dnring the growing period, say hetween April and Octoher of each year, an amonnt greater than our annual rainfall. The area irrigated is about 1,500,000 of acres, and the great cost of some of tho works, their distribution and application, amonnts in one instance —that of the Wilan Canal, to $400 per acre. These improvements are the work of a vast popnlation and of centuries. They consist of heavy masonry dams, thrown across monntain torsents; of revetments of masonry whicb follow the alignment of rivsrs for miles, in ons instance tbat cams nndsr my notics of 40 miles, protecting ths canals from srrosion of flood without and ths wear within. Canals paved within to prevent their deepening; tnnnels nnder high grounds; aquednets for crossing rivers and valleys; syphons under, ovsr and tbrough canals, and this work gsnerally of rock masonry. Ons is astonished at the evident cost and labor. Yst the water is all eagerly appropriated by the farmer or manufacturer, who would willingly pay for more. Thsss canals havs greatly enriched ths soil and improved ths sanitary condition of the conntry, to whoss productiveness they so greatly add. Thsy have enriched ths land ownsrs and contribnted to the snpport and comfort of ons of the most densely populated districts of Europs. Tbs popnlation of ths irrigated lands in Piedmont is 270 to the sqnare mile; Lombardy, 390; Lodi, 475. And in whatever conntry irrigation works sxist, ths popnlation increases. The holdings are generally small, rarely sxceeding a few acres; hnt in Italy, Belginm and Francs, as I bave ssen, three to five crops ars annually raised, two being in ths ground at the sams time in diffsrent degrees of growth.

Irrigation in California.

Perhaps I have said snongh to impress upon your minds ths great esteem and importancs in which irrigation is held, whers it has bssn the longest and most gensrally practiced. A nsarer illustration may interest yon more. It may be fonnd in the more southsrn counties of onr Stats, in Utah and Colorado, whers it has been practically tested for the last 10 or mors years, and with ths highest degres of profitabls sncess. Los Angsles connty hsads the list in priority of uss, and to some extent thorongh scientific application. The Padres of the varions missions from 80 to 100 years ago, constructed canals and acqnednts to convsy water to the arid plains where were located their religions establishments. Although few of the latter have snrvived, their orange, fig and olive orchards and vineyards still bear witness to thsir enterpriss, zeal and devotion. The total watershed which supplies ths conntiss of Los Angeles and San Bernardino, under one systsm, amounts to about 500 cubic ft. per second, transmitted in 126 canals of an aggregate length of 440 miles, irrigating 64,490 acres. Thess canals supply a large number of flonrishing settlements, ths popnlation of which are engaged in the cultivation of the vine, the orange, lime, olive and other semi-tropical frnits, besides the usnal field products, with best pecnniary resnlts. And it mnst he borne in mind that without water artificially applied, much of these natnrally fertile, hut arid lands would be nearly worthlsss for agricultural pnrposes. Bsfore irrigation works were constrncted mucb of the land was sold for $2.50 per acre; now it is said to be worth $100 per acre, unimproved.

Mainly within tbe past ten years the people living in the vicinity of Kern, King's, San Joaquin, Merced and Stanislans rivers, have had the foresight and snergy to construct canals and direct the watsrs to irrigate the otherwise dry and sterile plains. The canals have multiplied and flonrishing settlements havs sprung up along the line, adding wealtb and popnlation to the conntry. Areas of vines, wheat, barley, corn, beans, alfalfa, cotton and other crops are grown that astonish even the natives; and I was equally astonished at tbe sesmingly fixed and prolific crops of the infantile and yonthfnl native, and became satisfied there wonld eventnally be no lack of edncated and practical irrigators, which the country needs.

Some of onr political economists have proposed that the drainage or cachement area of the conntry embraced in what is called the San Joaquin and Tulare valleys, opening to the north with a downward slope, and the Sacramento valley opsning to the sonth with a downward slope, their waters nniting in Suisnn bay, should he ntilized hy the constrnction of grand trunk lines, following hy an easy grade the line of the foothills on the sast and west side of the drainage center of these vallsys, and receiving ths waters of the varions rivers which wonld intersect them.

It is svident that a work of this magnitnde could ouly be nndsrtaksn nndsr the anspices of the Stats, as a Government work; but this would be in my opinion, antagonistic to the best public interests. In the first place, onr rivers generally leave the foot-hills at right-angles with the drainage system of the valleys, and the topography of their nighborhood assnmes a parabolical form which rendera their local application to irrigation the most economical and convenient. Again, as matters now go, jobbery, surpassing that of "slickens" would he fastened npon the people in the shaps of hnrdensome taxation for years to come.

It would, however, hs well for the State to assume the proprietorship of all nnappropriated waters, and snpervise their conservation and equitahle distrihntion, thns preventing furthsr monopoly and wasts hy speculators or improvident claimants.

I approve in general terms (thongh with sxceptions) of the work that is now heing prosecuted under the snpervision of onr State Engineer, in the varions departments to which hs has been assigned.

A Patent Suit.—An action has bsen commenced in the United States Circnit Court, hy John J. Johnson, to recovsr $25,000 damages from A. Lusk, W. Jacohs and J. Kleinhaus, for the alleged infringement of a patent soldering apparatus, and to enjoin the defenants from the further uss of the same.

Editor and Contributors.

It has always been ons of our sditorial tenets that ths strength and usefulnsss of a journal lie not alons in its subscription list and in its editortial chair, but in its power to draw out the thonghts, observation and sxperiencs of its readers, in ordsr that each may snjoy ths truth and snccess which all have discovsred, or attained. Our ideal jonrnal is one which shall present each snbject in ths light of tbe freshest research and ths widsst experiencs. If a comet flasb in the sky, lst ons who has made astronomy a carsful study tell ths people, in a style every one can comprshend, just what is known abont it, and what, according to ths best knowledge of snch bodies, will bs its future. For the lack of snch authoritative statemsnt and from ths nnbridled fancies of rsportsrs, which occnpied space which should bave been better used, thsre are donhtless some peopls who believe that ths comet now visible is rsvolving around ths polar star. And, dropping to mundans affairs, the papers ars filled with ths imaginings of nninformsd writsrs on social and industrial subjects until ths public mind is charged with idsas on nearly all thsmes which ars crude, untrue, and apt to mislead. For such deception and misguidancs of the popnlar mind, ths editor is responsible.

Thsre is scarcsly an issus of a journal which does not contain some statement of fact or dsdnction therefrom which is in reality an untruth, in essence and in infsrencs; and there are readers, few or many, who know it. In the public interest it is the duty of the knowing one to correct the error, and the editor should welcome the new light and haste to shed it forth. In this way the public wonld be edncated in the truth, both in small things and great, and the result is delightful to contemplate. We admit that editorial conceit would receive a stnnning hlow, and we see no reason why editorial conceit should bs spared the crushing. It is an old dogma that an editor should hs omniscient, and that journalistic dignity will not admit a correction of any kiud. The jonrnal will never be true to its mission nntil snch narrow ideas ars swept away.

But we did not intend to writs a homily upon editorial condnct in general, but rather to point out olearly what we belisve to he one way in which a journal may be brought np to the highsst intelligsnce of the time and press most clossly to the popnlar beart, and that is by encouraging its readers to freely contrihnte the trnth which in them lies, whether it bs a point of international law or ths growing of a turnip. Much depends upon the editor whsther his journal shall havs a reputation for the fullest truth and accnracy on the subjects it discnsses, or whsther it shall slash around so that the lawyer may laugh at its ignorance one day, and the farmer denonnce it as a pack of nonsense the next. If the editor is courteous toward contribntors and welcomes thsir favors, the lawyer will be glad to set him right in the pnblic interest, and the farmer will ransack his honse for writing matsrials to tell him that he can't make a pound of hntter from five lbs. of milk. But if the editor shows that hs cares more for what he has said than for the truth and if the waste baskst is proclaimed the largest piece of fnrniture in the sanctum, the editor will naturally hs left alone with his conceit and the propagation of error and fallacy will contInne.

We are led to these rsmarks by the perusal of an interesting article in an English magazine concerning Dickens as an editor, and we are proud to know that ideas and methods which we have held and practiced in onr modest experience, were characteristic of him in his editorial conduct. The writer shows that he was most kind in his treatment of contributors, and in this way drew out their best efforts and enriched his jonrnal hy them. We have not spacs to cite ths many instances of this behavior which are givsn. In one place, alluding to Dickens, the writer says:

> It is in his relations with writers in his periodical, and, indeed, in all connections with his "literary brethren," as he modestly calls them, that this amiahle and engaging man appears to the most extraordinary advantage. As I read over his many letters on those points, I am amazed at the good-natured allowance, the ontiring good humor, the wish to please and make pleasant, the almost deference, the modesty in one of his great position as head, perhaps, of all living writers—to say nothing of his position as director of the periodical which he kindled with his own perpetual inspirations. There was ever the same uniform good nature and ardor, the eagerness to welcome and second any plan, a reluctance to dismiss it, and this done with apologies; all, too, in the strangest contrast to the summary and plain-spoken fashion of the ordinary editor. This patient interest should, in these editorial matters, become more wonderful when it is considered that his position as head of an important periodical made him a marked figure for importunity. I believe every composition was seriously glanced at, and some estimate made—and many an obscure, clever girl was surprised to find her efforts appreciated

The writer of this tribnte to Dicksns as an editor, and who, we imagine, is himself one of the best known of living novelists, proceeds to show the patient labors of the editor in "tonching up" contribntions, which it mnst he acknowledged is often a severs task, hut which no true editor will shrink from, providing there is merit in the article. He writes:

> I have many proof-sheets by me, corrected hy his own hand in the most painstaking and elahorate way. The way he used to scatter his bright touches over the whole, the sparkling word of his own that he would insert here and there, have a surprising point and light. The finish, too, that he imparted was wonderful; and the "dashes," stops, shiftings, omissions, were all valuable lessons for writers. Now, this was all encouraging and cordial to a degree. I frankly confess that, having met innumerable men, and having had dealings with innumerable men, I never met one with any approach to his genuine, unaffected, unchanging kindness.

It would be well for jonrnalism if ths spirit of Dickens wers invoked in every sanctum in the world. If all the mole-eyed conceit which rules in editorial chairs could he melted away in the sunny welcoms to worth, which was his constant disposition, how mnch that is trus and valnable wonld pnsh from the colnmns the vapid gensralizations, ths gross inaccuracies and the glaring untruth and injustice which ars too prsvalent. Ws believs that this will bs the futnrs of jonrnalism. Such policies are gaining gronnd and ths people ars every day learning to distinguish mors and mors in favor of trne gentility, and lovs of truth for its own sake, in ths journals which they support.—*Rural Press.*

The Goose Creek Mountains.

Copper and Gold Mines.

Sheriff Hanks and D. H. Jackson have returned to Virginia city from a trip to the Goose cresk mountains, where they havs located soms very promising mines. Ths *Enterprise* says that Shsriff Hanks found ths ledges abont nine years ago and did soms work on them, hut ths predominant mstal being copper, and thers being at that time little said abont copper, hs did little more than to make snch explorations as showed him that hs had an almost unlimitsd amount of ths ors. Not only is ths ore rich in copper (running from 15% to 50% in that metal), but it also contains much free gold. This gold is found embedded in the midst of solid massss of rich copper.

They brought home with them over 100 lbs of the ors, and are now having it carefully assayed. It appears probable that the gold contained in the ore will much more than pay all expenses of working, leaving as further profit the full value of the copper.

Messrs. Hanks and Jackson located four ledges, which are from 18 inches to 7 ft. in width. In thess they havs in sight on the surfacs a great amount of ore and there are on the dnmps (dng out by Mr. Hanks years ago) hundreds of tons of the ore.

Thsy have bonded a silver-hearing lode, situated in the same region, which promises to bs of great valus. The lods crops out for a mile or two and averages about 12 ft. in width. In the narrowest place to he found the vein measnres 4 ft. from wall to wall.

The gentlsmsn were absnt from this city but sight days, therefore had not time to do much prospecting, but say thsre is a fins field for prospectors. The only man in the section of conntry visitsd by them is a ranchman; no prospsctors in ths place. The conntry is everywhere covered with float quartz. The only ledges that havs evsr besn sven snperficially examined are those that crop out; no ons has done anything toward following up float and unearthing such veins as havs heen covered up—the blind ledges.

The mines are hut 40 miles from Tscomo, on ths Central Pacific, and from them to the railroad the country is level, and an excellent wagon road may easily bs made over which to transport ors and supplies.

The country is well wooded and watered and contains mnch good agricultural and grazing land. Game is abnndant, not only doves, rabbits, sagehens and prairie chickens, but also deer, monntain sheep and other large gams. Altogether it is about as fine a country for the prospector as could well he imagined. The mines lie in the extreme northeast corner of Nevada, bnt a few miles south of Idaho and a few miles west of the Utah line.

From Alaska.—M. W. Murray, of this place returned this week from Harrisbnrg, Alaska, where he has heen since February last, prospecting and looking after the interests of a company of which he is a member. Mr. Murray tells no tales of the prospective fabulous wealth of that far-off land, but brought with him a numher of quartz specimens, the richness of which calls hright visions of fortune to the minds of those who have seen them. Without exaggeration, we regard ths specimens as indicative of richer gold quartz mines than any ever hefore discovered. Ths rock is in large pieces, and to nse a minsr's phrase, is "perfectly lousy with gold." Thsy are not selected small specimens, but fair samples of the quality of the ledges discovered as far as they have been prospected. None of the lodes have as yet been snnk on to any considsrable depth, in fact have not heen touched more than a few ft. below the surfacs, hut give every indication of heing hoth extensive and rich. They are located from three to four miles hack from ths coast, and on a monntain. So far, comparatively few discoveries have heen made, hnt more are anticipated, as the 200 men now in that section ars doing a great deal of prospecting. The specimens brought by Mr. Murray are from six or eight different minss. Placer mining is heing done in the neighborhood of Harrisburg, and is said to pay from $5 to $20 psr day to the man. The cost of living there is ahont the same as here. Mr. Murray goes from here to San Francisce and thence hack to Harrisburg, from whers he promises to keep ns posted regarding furthsr dsvelopments in that section.—*Trinity Journal.*

There are 10 or 12 arastras at work between French Gnlch, Shasta county, and the mouth of Deadwood.

The Mining Field East of San Joaquin.

Adventnrous prospectors, who leave California to encounter the hardships and dangers of gold-seeking in the fnr northwest, and others whose love of change leads them to the uncertainties and roasting climate of Arizona aad Now Mexico, soldom consider the fnct thnt they leave eqaally if not far more promising fields at home. The minernl range, extending from Sntter creek, Amador county, southward through Cnlaveras nnd Tuolumne counties into Mnriposa, is to-dny the most inviting field for ths investment of cnpital in miaing industry on the Pacific coast. During the early days of Placer mining, botb Calaverns and Tuolumne were celobrated for the richness of easily accessible gold deposits in the gulches. What early sottler forgets the enormous quaatities of gold obtained in the noigbhorhood of Mokolumne hill, aad in the aumerous localities south, in the direction of San Aadreas, South Calaveras, Cberokee Flat, Altaville, Angels, Carson Hill, and across the Stanislans river into old Tuolumae, which ia early days gained a wide reputation for riches on accouat of the numerous fortnaes acquired by miners in Woods' creek alone? The ledges from which these enormons amounts of fragmentnry gold must have heon detached are still comparatively untouched. A few rich, permanent mines have been developed at snndry poiats in those two counties, as well as in Amador; hut the main body of gold-bearing quartz remnins as undisturbed as before the disoovery of the precious metsl on the coast was first made kaown. In the northeastern part of Calaveras, in the neighborhood of West Point, Railroad Flat, Rich Galch and sarrounding hills, qaartz lodes rich in gold have loag beèn known to exist, hut efforts to introdace the most approved and economical means of development have been comparatively limited. Now and then a rich strike is reported, aad encouraging accounts of the profitable development of a mine here and there are givea, bat the fact that little has heretofore been done in the way of briaging capital and energy to bear in developing the richness of that section, on a scale commeasurate with the outlook, made encoursging by discoveries already made, canaot be denied. Dnriag the past few years the mining indastry in the counties named has been manifestly improving, and it would improve still more rapidly were the capital and enterprise of our own State more disposed to look with favor upon realities at home instead of taking speculative risks in remote territories. It would he nonsense to conclude that the few paying mines in Amador, Chili Ridge, Sheep Ranch, Angels, Carson's, Murphy's and Vallecito, in Calaveras county, and a small number of mines successfnlly operated and notable for their richness in Tuolumne county, embraced one-thousandth part of the rich gold deposits in the district. Now that settlers can obtain title to the mines and farms along the mineral belt, a new ora of prosperity may be reasonably expected. Permaaent settlement is one of the first essontials of prosperity. So loag as the people of the mining counties were, in the main, nomads, wandering from gulch to ravine, and from riverbed to hillside, as faacy and hope of obtaining a little of the precious metal might dictate, the kind of prosperity that brings comfort and riches to communities, and wealth to the State, could hardly be hoped for; but permanent settlement can hardly fail to assnre healthy development of latent resources. There is nothing better calculated to speedily infuse new life and vitality into all kinds of indnstrial pursuits at home than the judicious investment of capital in the quartz mines near the populated centers in our State.—*Stockton Independent.*

Shasta County Mineral Resources.

The sale of the Copper city mining and milling property, owned by the Extra M. Co., to a party of English capitalists, is, as we understand, substantially effected, and only awaits the signatare of some parties interested but absent and acquiesciag in the agreement of sale. The Copper city property is one of magnitude so great that the mere mention of the facts known in regard to its richness, would challeage the criticism of the sceptical and doubly stimulate the "marvellous" lump of those who are marked "low" on that protuberance by Prof. Fowler. In Copper city hills Nature planted a wealth and profuseness of precious metals, that when revealed by the stroke of the miner's pick aad giant blast, will outrival the gorgeous vision revealed by the flash of Aladdin's lamp. The simple record of the bullion shipments made by the Extra mining company, that have been made public, is enough to ehow thst the Bully Hill Extra, and Jennie June mines alone are sufficiently rich in the way of gold and silver production to more thsn equal many of tho dividead psyiag mines quoted ia the San Francisco and Eastern stock markets.

Next to Copper City in mineral value, in proportion to the dovelopments so far made and the indicatioas of what may be expected, looms up Iron mountain. Within that iron-bound crucible Nature has worked her retorts, and the amalgam is at the disposal of the tappers of the retorts, snd the tappers are not idle. Within the next few montha will be shown a miaeral development in the mountain, at the very base of which our children play, that will astonish the miuing world. And old Shasta residenta and pioneers, whose lines are cast in far different places, may expect to soon hear of news that will make them long to be in the new El Dorado.—*Shasta Courier.*

Useful Information.

Why Woolen Fabrics Shrink.—The fibers of wool and certain kiads of hairs, are toothed or jagged at the edges, the teeth (or imbrications) poiating upward—that is, from the root to the poiat. When subjected, therefore, to compression or friction these fibers, being free to move only in one direction by reason of these asperities of sarfnce, have a great teadeaoy to anite aad lock together. This explains the peculiar capnbility possessed by wool, of felting, aad also the shrinking of fabrics of wool. In the latter caso, tho excessive rubbing to which they are subjected causes a matting or binding together of the altimate fibers, which causes shrinknge; and this is iatensified by changing the goods from hot to cold water, wbich is usnally practiced, ns the contraction of the fibers which this canses is itself a felting proaess. For washiag woolen articles, it is recommended to place them ia warm wator, never in cold; and if changed from one water to another, they should go from hot to hotter. They should be oleansed with as little and as gontle friction as possible. The fibers of cotton and linen are straight and smooth, and possess none of the surface roughnesses that characterize the struotnre of wool, henco they do not shrink in washiag.—*Manufacturer and Builder.*

Covering for Boilers and Steam Pipes.—The following is a French idea: The surfaces are covered with sawdust mixed with flour paste. If the paste is not very liquid, the mixture heing nsed in the form of moderately stiff dough, and the surface of the boilers or pipes have been well cleaned from grease, the adhesion is perfect, aad the material is free from cracks. Five layers of this composition are recommended, each about one-fifth of an inch thick. It is said that one inoh of this composition will give better results than double that amount of the materials nsually employed. The paste is composed of rough flour without the addition of starch. The mixture can be applied without a trowel, and if there is much exposure, twa or three coatings of tar will render the composition impervious to water. Copper tubes should first be treated to a hot liquid solntion of clay, so as to iacresse the adhesion of the sawdust.

Elephant's Milk.—Dr. Charles A. Doremus hns been much interested in an analysis of the milk of strange animals. His greatest difficulty was to get the milk. When Barnum's show was here he interviewed a lioness, but her claws were two long and menaciag. He did, however, succeed in getting a sample of the food npon which the only American-born baby elephant was brought up. Dr. Doremns gave an account of his analysis before the American Chemical Society. He said it was no wonder that elephants were snch great, hearty, overgrown animals, because the milk upon which they are nurtured is the richest he ever saw. It contaias less water and more butter and sngar than almost any other kind, and has besides a delightful flavor and odor. It is about half cream, and the butter made from it, which is rather softer thaa tbe ordinary butter, is very rich. The oil extracted from it is clear and like olive oil.

The Finest Floors are said to be seen in Russia. For those of the highest grade, tropical woods are exclusively employed. Fir and pine are never used, as in consequence of their sticky character, they attract and retain dust and dirt, and thereby soon become blackened. Pitch pine, too, is liable to shrink, even after being well seasoned. The mosaic wood floors in Russia are of extraordinary beauty. One, in the Summer Palace is of small squares of ebony inlaid with mother of pearl. A considerable trade is done in Dantzic and Riga by exportiag small blocks of oak for parquet floors. There is an active demand for these in France and Germany, but none in Eagland.

Wood-Topped corks are novelties recently brought out by an American firm, of New York. The cork is provided with a cap of wood, which greatly facilitates its removal from a vial or bottle, and forms a very elegant finish. Owing to its breadth, the cap can be grasped in the same way that an ordinary "mushroom opener" is held, and sufficient torsion exerted to dislodge it without the necessity of resorting to a corkscrew. The cap is provided with a central vertical projection, which is glued fast in the center of the cork, so that the latter must be destroyed before they can be separated.

To Prevent Colors Running.—It is said that a teaspoonful of black pepper will prevent gray or buff linen from spotting if stirred into the first water in which they are washed. It will also prevent the colors running, when washing black or colored cambrics or muslins, and the water is not iajured by it, but just as soft as it was before the pepper was put in.

Water as a Deodorizer.—Water is a much better deodorizer than ia generally anpposed. It has great absorbing capaoity. Fresh water running through a milk room keepa it free from odors. Standing water soon becomes charged with odors, and then givea them off again. Water used in a milk room to cool the milk ia a great purifier, bnt mnat not be allowed to stand more than 12 bours before being removed.

Discolored Brick Walls.—The white saline substance that "comes ont" npon brick wnlls, nnd which has beea a sonrce of annoyance to n great many, mny, acoording to the *American Architect*, be remedied. In reply to a qaery oa the subjoot, it says: The "saltpetoring" of brick-work can gcaerally be preveuted by ndding oil to the mortar at the rate of a gallon to the cask of lime. If cement is nsed in the mortar, an additional gallon of oil must be allowed for each cask of cement. Linseed oil is generally employed, bat any kiad that does not coatain salt will answor. The incrustation, once formed, can be removed with hot water, or by the muriatio acid generally used for cleaning down brickwork, but it will reappear again by exudation from the interior of the wall, and nsually leaves a permaaent black, or brown stain.

New Mode of Sugar Adulteration.—By a recent iavention, starch or corn sugar (more generally known as *glucose*), heretofore qnite extonsively used hy confectioners, brewers, etc., has been made sufficiently dry and wbite so that it can be powdered and mixed with yellow sugars. It rnises the standard of color largely, but not being so sweet, reduces the sscchsrine streagth, making it necessary to use more of the article to attain the usnal degree of sweetness. Large qnantities of this mixture are now beiag made and sold nndor various brands in tbe New York market.

Wear in Wire Ropes.—Dr. Chance, in discussing this subject at a lato meeting of the Engineers' Club of Pbiladelphia, drew the conclusion that the cause of rapid wear is often due to the use of drums, sheaves aad pulleys of insafficient size, aud that a great saving might be effected by increasiag their diameters, especially that of the small deflectiou and knucklo pulleys and sheaves. The actual wear averages 0.138 cents in slopes and 0.053 cents in shafts per ton for each 100 ft. of lift.

To Detect Soapstone Adulteration.—Detection of adulteration with soapstone in candies, sugar, flour or butter is not at all difficult. Dissolve the suspected candy or sugar; the insolable mineral will remaia. Burn a sample of suspected flour; an excess of ash will betray the cheat. Melting and filtering will do the same for suspected lard or butter.

Iron or Steel immersed in n solution of carbonate of potash or soda for a few miautes will not rust for years, not even when exposed to a damp atmosphere.

Good Health.

Water as a Part of Diet.

Many persons drink ordinarily as little water as possible, and none at all at meal times, because they suppose that water dilutes the gastric juice. Experiments, however, show that dilution does not diminish the digestive power of the gastric juice, and further, that water alone, as well as solid food, awakens its secretion.

A paper, read by Dr. Webber, of Boston, at a meeting of a learned medical society, took the ground that water, used moderately at meals, is beneficial, and that a large class of people drink too little.

The result is, if too little water is drank—especially if the person eats heartily—the perspiration and the kidney secretions are diminished. Not only they, but the waste of the system which can be removed only in a state of solution, is not eliminated with sufficient regularity and fullness, and tbe system becomes gradually clogged by it. The accumulation is slight from day to day, but in time unpleasant symptoms are developed.

Theee symptoms are of an indefinite character—discomfort, even pain, sometimes in one place and sometimes in another, constipation and nnhealthy hne of the skin.

"Patients," says Dr. Webber, "who drank no more than a pint of water a day, have told me that they were not thirsty. They were surprised when told to drink more. Those who have followed this suggestion, in the course of a week have developed thirst, and drank as many as three pints of water a day."

We may add that water taken into the stomach is at once rapidly absorbed by the blood vessels. A bowl of well-seasoned broth as a first course is specially helpful to the above class of patients. A large quantity of ice-cold water is harmfnl to any one.

Dr. T. C. Duncan, in his book entitled "How to Get Plump," shows the necessity to the human system of frequent draughts of water. The Doctor says that "few people appreciate the fact that water constitutes in the normal human subject ahout 70% of the entire weight of the body. The water which thus forms a part of the animal frame is derived mainly from without. It is taken in the different kinds of drink, and also forms an abundant ingredient in the various articles of food. Water is abundant in the blood and secretions, where its presence is indispensable in order to give them the fluidity which is necesoary to the performance of their fnnctions. Water is therefore an esaential ingredient of the fluids, for it holds these solid materials in solution and enables them to pass and repass through the animal frame. Water ia also an ingredient of the solids—mnscles, tendons, cartilagee, bones, teetb, glands, skin, etc. If the water of tendons, skia, etc., be evaporated they become yellowish in color, shriveled and unfit for performing their functions. This accouats for the sallow appearaace of lean people. With these facts before us, coatiaues Dr. Duncan, we can readily understand why a person who does not take much water except in food is leaa. Lackiag the necessary fluidity, the functions are all performed with difficulty. Many cases of dyspepsia are duo to lack of wnter. Many cases of headache can be relieved by increasing the fluidity of the blood. Many a case of functional palpitation of the heart can he mitigated by increasing the volume of the circulating fluid with an extra pond of water. I generally order a half-pint of water to he taken four times a day, early in the morniag, about 10 A. M., abont 4 P. M. and before retiring. I forbid cold water to be taken at meals, for the reason that the stomach is then at its highest functional activity, and cold lowers its temperature aad retards digestion. Warm fluids, like milk aad water, facilitate digestion.

Incurable Insanity.

To be hopelessly insaae, how terrible; worse than denth itself. There are some singulnr facts in refereace to insanity. New England gives the largest per centage of all sections of the Union, aad the extreme Southern States the least. In some Northern locnlities, there is one insane person to every 600 of the populatioa, while in the South, especially among the negroes, there is not one in 6,000.

Another strikiag fact is, that the asylums in this coantry have a larger number of inmates from among the farming population than from among any other calling. This is accounted for in the sameness, the horsemill life of a farmer; he trudges along ia the same track from one decade to aaother, bringing into requisition a single set of mental eaergies, while all the rest remain dormant to a certain extent; and grow wild like an undisturbed field. The fact is, no man was ever made to be a loafer, not even as to a nart of his faculties, corporeal, meutal or moral. There is enough to do in these ages of the world, to keep every son and daughter of Adam at work all the time of his waking existence, not at mind work alone or body work alone, but mind and body both at work all the time of working hours. It is because of the partial loaferism of the multitude that so many of the truly good among us perish before their time. Often is it that when men find a competent and willing worker they impose on him the duties of a dozen mea, and the inevitable result is that in a few years he is literally worked to death.

The true lesson is, let the multitude do more and the few less, theu will not these few die before their time, and then too, will not the multitude overcrowd our lnnatio asylums as they now do, no less than 561 being in a single hospital in Massachusetts. — *Hall's Journal of Health.*

Help The Children Grow Erect.—William Blaikie, the anthor of "How to Grow Strong and How to Stay So," spoke before the Brooklyn Teachers' Association recently on "Physical Education." "I want" said he, "to see if in an informal talk we can't hit upon some way in which we can bring the physical education of school children down to a practical basis. Our children who are healthy aad buxom when they begin school work, come out pale, sickly, and with round shoulders. If you require the childreu under you to sit far back on a chair and to hold their chins up you will cnre them of being round shouldered, and the lnngs and other vital organs will have free and healthy play. Another sample plaa is to have the children bend over backwards until they can see the ceiliag. This exercises for a few miautes each day will work a wonderful transformation. If a well-qualified teacher conld be employed to superintend the physical developmeat of the children the best results would be seen.

Sign of Death.—Dr. Chiappoli stated that he has frequeatly noticed in patients, apparently far from death, an extraordinary opening of the eyelids so as to give the eyes the appearance of protruding from their orbits, which was invariably a sign that death would occur within 24 hours. In some cases, when only one eye is wide open while the other remaias normal, death will not follow quite so rapidly, bnt it does take place in a week or so. It is easy to observe this phenomenon when the eyes are wide opea, but whea, as is generally the case the eyes are half shut and only opea from time to time, and it will be advisable to fix the attention of the patieut on some point of light in order to see the change. Chiappoli is utterly at a loss to explain this symptom of approaching dissolution, and ascribes it to some diseased state of the sympathetic nerve.

The Teeth —All mineral as well as vegetable acids act promptly on the teeth. In 48 hours acetic, oitric and malic acids will corrode the enamel eo that you may scrape a great portion of it away with the finger aail. Acid tartrate of lime, having a greater affinity for the lime of the tooth than for its own base, will rapidly destroy the enamel. Grapes, in 48 hours, will render the enamel of a chalky consistence. Vegetable substances are inert till fermentation takes place and acetic acid is formed. Sugar has no deleterious effect, only in the state of acetous fermentation. Animal substances exert no injurioua effect until putrefaction is far advanced.—*Scientific American.*

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Passing Events.

The gift of D. O. Mills, Esq., of $75,000 to the University of California, is very opportune. Mr. Mills gives this handsome sum to our chief educational institution at a time when changes in its management and criticism brought about thereby, make thoughtless people imagine the University in a bad way. Mr. Mills, who was one of the Regents and knew all about it, would not give such a sum to a moribund institution. It is to be hoped his example will be followed by other millionaires.

News from the north this week confirms the theories of the loss of the missing whale ships. Natives have seen the vessels with dead bodies on board. No tidings have come from the *Jeannette*. The winter was mild, and we may expect any time to hear from her.

The quartz and porphyry found in the south header of the Sutro tunnel carries some little metal, and is looked upon as an excellent indication of an ore body near at hand. The development is 50 ft. north of the south line of the Yellow Jacket.

The wounded President still continues to improve, to the great joy of all right minded citizens. It seems now that all danger is evidently past.

The Wood River country still continues to attract great attention, and the large number of prospectors now there ought to insure a great many new discoveries this summer. Many mining people are going down into Mexico, but, judging from late reports from some sections, it is not a pleasant place to travel near the borders. Several people have been killed by Indians, and numerous parties have been fired upon.

The Sweepstakes Quartz Mill.

We had an opportunity of examining, a few days since, the Sweepstakes quartz mill, which is in working order at the Oakland planing mill, Oakland Point. The machine, which is the invention of A. E. Redstone, is manufactured by the Sweepstakes Plow Co. The quartz mill carries the stamps in a revolving frame or face-plate, flanged friction wheels furnishing guides to the stems. The bosses, shoes and dies are adjusted the same as in the ordinary battery, the dies being in three segments of a circle around an inside cone, in which the perpendicular shaft rests. To this shaft is attached the revolving face-plate and bevel wheel, on which the pinion meshes that is keyed to the pulley shaft.

The cams, upon which the rollers or wheels which raise the stamps are attached, are placed on the outside of rim or curb. Upon the center being revolved, carrying the stamps, they are carried up the horizontal cams by these rollers—each stamp having its own roller—and, gaining the highest point, are dropped. As they drop they strike an angular blow, or rather a glancing one, then grinding on the quartz as they slide around on the die, until they are lifted by the next cam.

The mill we inspected carries eight 125-lb. stamps, drops five inches with the accelerated force of the revolving movement of the speed at which the stamps are carried around. The whole mill weighs 2,650 lbs., eight stamps and all. There are 48x14 inches, of screen surface. The mill requires comparatively little power, and it is possible to run it by hand. With one cam acting and running at 144 revolutions, it strikes 1,152 blows a minute. We saw it at work with three cams in place, each of the eight stamps dropping three times a revolution, the mill thus striking 3,456 blows a minute, with 125-lb. stamps dropping five inches.

The cams are easily removable, and one, two or three may be used. With one cam only, each stamp, after its drop is slid around the die the complete circle till it reaches the cam, grinding the quartz for the entire distance. If two are used, it drags half way, lifts, strikes the blow and drags again. All those stamps not in the act of rising are grinding or performing the work of millers in a pan. Both shoe and die wear uniformly and smooth, so the iron can be worn down to the last half inch, there being no ragged, rough surface.

The owners of this new mill will have one or more of them in practical operation during the Mechanics' Institute fair, when miners and mill men can examine them at work.

The mill is portable, and is made all ready to attach to a belt. The heaviest piece is 125 lbs. It can be run by horse power, as well as by steam. A miner can pack one on burros, and then make the burros run it, thus utilizing his means of transportation as power.

The No. 1 prospecting mill weighs 775 lbs.; No. 3, 2,650 lbs.; No. 4, 7,000 lbs. No. 1 is calculated to crush 400 lbs. an hour; No. 2, 1,000 lbs. per hour; and No. 4, 4,000 lbs. per hour through a No. 60 screen. No. 1 carries seven 35-lb. stamps, and strikes 1,400 times a minute; No. 3 carries eight 125 lb. stamps, and strikes 1,680 times a minute; No. 4 carries sixteen 300-lb. stamps, striking 3,840 times per minute, grinding the distance between the inclines. No. 1, the prospecting mill, is sold complete for $300; No. 3, $700; No. 4, $2,000. Mr. Hill says that No. 1 requires half-horse power—a burro; No. 3, one-horse power; and No. 4, less than six-horse power. All the mills have an extra set of shoes and dies.

The mill is certainly compact and portable, and is a sort of combined battery and pan. The grinding feature, for "rusty gold" would be advantageous. For prospectors' use the No. 1 mill is the lightest of anything of the kind we have heard of, and the slight power required to run it is a great advantage. We thought perhaps the grinding action would use up a good deal of iron but Mr. Redstone and others who have used the mill, say that this is not the case, since the shoes and dies wear down smooth and even, and there is no breakage. This may be used, therefore, until entirely gone, which is not the case with ordinary stamps. Several of these mills are now at work in mines in this State.

Mines in Indian Reservations.

The Commissioner of the General Land Office in reply to the settlers upon the mineral lands of the Ute reservation, says: "In your communication, you request to be informed by what means persons now in occupation of valuable mining claims, which within a few months have been ascertained to be within the limits of the Ute reservation, may maintain their possession. You state that these claims have been located at various times since 1876, under the supposition that they were situated upon public lands subject to sale, and outside the Indian reservation; that the claims have been sold in instances for large sums of money (aggregating from $3,000,000 to $5,000,000) to equally innocent purchasers; and that since the fact that these claims are situated in Indian country has been ascertained, many of them have been 'jumped' by outside parties.

Notwithstanding the hardships which accrue from the facts stated, it is perfectly clear that none of the locations made are legal, and the locators were and are trespassers, though, perhaps, not intentionally so. The 'jumpers' are wilful trespassers. No valid possessory title has been or can be acquired until the land is declared subject to occupation, and the parties who have made locations and those who have purchased claims, have no possessory rights which can be maintained."

The Engineers and the Debris Dams.

Col. Mendell and other engineers and experts have examined the brush dams on the Yuba and Bear rivers, with a view to learning their present condition and to observe their effects. All parts of the Yuba dam were thoroughly inspected, and it was found to be in very good condition. Commissioner Knox says:

We found two breaks in the Yuba dam. One was from 300 to 400 ft. wide, and about a quarter of a mile from the south end. It appears that the whole structure at this point has gone out. About half a mile farther on is the other break, which is in the neighborhood of 700 ft. wide. There are evidences of brush remaining at places over the break along the bottom, but this cannot be definitely determined now, as the river is still running through these nearly the whole width. The most of the way, however, it is only a few inches in depth, but the slickens beneath is soft and not inviting to an over degree of curiosity. From this point to near the north end of the dam no injury has been done whatever, and so far as can be seen the crest has not settled in the least out of range. The top of the dam is covered with heavy driftwood, much of which is composed of logs two ft. in diameter, which have caught upon the crest and been left there as the river fell.

Above the portions of the dam where there has been no breaks, the sand and gravel is filled in and retained within two or three ft. of the crest of the dam, and the fight is apparently continued with ascending grade as far up as can be seen, with an occasional small bowlder two or three inches in diameter. Upon the lower side of the dam the sand is from 4 to 6 ft. lower than above. From immediately below where the water pitches over the dam, and down for a distance of several hundred ft., there has also been a large deposit of debris caused by the slower movement of the water, and which grows less again as the water regains its velocity.

Within the dam, where the breaks occurred, of course the sediment which had been filled in was carried through and into the river again below, and channels with sloping sides are thus formed inside the dam, leading to these breaks and extending as far above as could be seen from the crest. We were informed by a man who resides near by, that prior to the breaks in the brush work, the water above the dam presented the appearance of a lake, being nearly still, and the accumulation of sediment apparently even the whole way across. The dam from one end to the other, including the mattresses below, where not covered too deep with sand, is now a dense growth of willow, except at the breaks. This willow growth has sprouted from the logs and brush of which the dam is composed, and presents the appearance of a green ridge, extending from one bank of the river to the other, and is from three to four ft. in hight. New roots are thus forming, and the entire structure will soon become formidable from this new growth, and indestructible to any action of floods, and by slowing the water, if the old breaks are repaired, will stop the sediment and cause a building up and raising of the crest of the dam to quite an extent without artificial means. This is as Capt. Eads and the engineers stated would be the case, and but for the untoward circumstances which caused the breaks, the dam would now be growing into an indestructible barrier the entire distance between the high lands upon either side of the river.

Confidence in the Dam.

Colonel Mendell and his assistant were highly pleased with the portions of the dam which remain intact, and are extremely anxious to have the breaks repaired, being entirely confident that by so doing the experience of another winter will demonstrate that the original opinion of the engineers, that these structures could be made to perform the office for which they were intended, was correct. So confident is Colonel Mendell upon this point, that should the Drainage Act he declared by the Supreme Court to be unconstitutional, he would, if he had Government money at his disposal, repair these dams at once to prove their success.

At the Bear River dam they found two breaks. One near the north end is from 300 to 400 ft. long, and the other is about 100 ft. long and near the south end. Between those two breaks are settles in three or four places. This dam is also found to be growing a thick mat of young willows the entire length, except at the breaks. My impressions are that not so much sand and gravel deposit has been made in this dam as on the other river, but a very large amount is to be seen above, and is filled in to considerable depth.

THE hoisting works on the lower shaft of the Grand Prize mine are being moved to the Navajo.

New Hydrocarbon Furnace.

It is nothing new in hydrocarbon furnaces to employ a series of pockets filled with a mass of refractory material saturated with the oil, which pockets alternate with air chambers which receive air at the bottom and discharge it at the top, where it combines with the gases evolved to effect combustion.

An Eastern inventor, however, has got up a hydrocarbon furnace having the bottom of its combustion chambers made with a series of longitudinal pockets containing asbestos or analogous absorbent material, with perforated oil pipes imbedded therein, and with alternating air chambers arising between said pockets and communicating below with the portion of the furnace corresponding to the ash pit. The said air chambers being perforated at the top and surmounted by inclined hoods or sheds which deflect the currents of air down upon the surface of the saturated asbestos.

The advantage of these hoods is said to be that having their sides or wings extending obliquely down into the asbestos pockets, and deflecting the air-currents down upon the surfaces of the asbestos, they contribute to the intimate mingling of the gases and produce a more active combustion. These hoods, also, by covering the perforations on the top of the air chambers prevent them from becoming stopped up. A successful hydrocarbon furnace will be a valuable thing.

The Brush Dams.

In another column we give the results of the examination by the engineers, of the brush dams across the Yuba and Bear rivers, for impounding the debris. As will be seen, they express themselves as satisfied with the result of these preliminary trials of the brush dam system.

Before the dams were built the State Engineer had cross-section lines run across the river every 2,000 ft. for three and a half miles above, and marked by stakes and bank marks on each side of the river, so that the amount of filling which should take place could be accurately ascertained. Surveyors are now employed upon both sides of the river reviewing these cross-section lines, which will furnish accurate information upon the subject when the surveys and deductions are completed.

One of the Commission was asked the question as to whether in case the injunction suits now pending, or others which may be brought, should stop the hydraulic mining, would it be thought necessary to then make repairs to the debris dams which your Commission have built?

The answer to this was as follows:

The necessity for repairing these dams does not in any manner depend upon the success or failure of the suits against miners. The amount of debris now in the rivers and canyons above the dams renders it the part of wisdom to keep it out of the navigable rivers, or they will be destroyed, even if no further mining should be done. Persons who have not examined the subject have but little idea of the danger from this source. The amount lodged in the canyons and rivers above these dams is simply enormous, being in one place, to my knowledge, not less than 150 ft. in depth. Of course this is an exception, but the amount is very great, and even if the mining should cease now, this deposit would keep working down into the rivers and valleys, producing great damage. These dams are needed to hold back the debris now in the rivers and canyons, and it will be a profitable investment to add the small amount that it will now cost to make them effective and successful. In case the mining should be stopped the dams will not only prevent the debris above from being brought down, but will also, by doing this, keep the water from being loaded with heavy material, and enable it to scour out and carry away the deposits in the beds of the rivers below. These dams, therefore, should be repaired and preserved, whether hydraulic mining is stopped by the courts or not.

Mining Rulings.

Where a vein or lode of mineral is discovered upon lands entered under agricultural laws but previous to issuance of patent, such vein or lode, with surface ground, may be located under the mining laws and relinquished and segregated from the agricultural entry previously allowed. It will not be necessary to relinquish the entire legal subdivision upon which such mineral location has been made unless subsequent development and discoveries, before issuance of agricultural patent, demonstrate that such subdivision is more valuable for mineral than agricultural purposes.

No specific amount of annual expenditures upon land located in good faith for milling or mining purposes. The performance of the annual labor of the required value upon a lode claim is sufficient for the purpose of retaining possessory right to a mill site located in connection with said claim.

Applicants for mineral patents are required to establish their citizenship either by their affidavit sworn to before an officer authorized to administer oath within the district where entry is made, or by the affidavit of disinterested person before a proper officer anywhere.

Hurdy-Gurdy Water-Wheels.

[Written for the PRESS by LUTHER WAGONER, C. E.]

Notee upon the Measurement of Power Developed by a Hurdy-Gurdy Water-Wheel.

The data here given was taken Jnnnary, 1880, at tbe quartz mill of J. H. Malone, of Mariposa, Cal. The object in view was to determine the proper speed of the wheel and to measure the avnilnble power. Tbe wheel has a vertical axis, and is 40$\frac{3}{4}$ ft. in diameter, or 128 ft. girth through center of huckets. A beveled spur and pinion of $\frac{1}{4}\frac{3}{8}$ teeth transmite motion to n horizontal shaft having npon it a cast-iron pulley 36 inches diamoter und 16 inches fnce. The wheel hne 16 arme 2x6 inches, aod a board, 1x8 ioches, is bent around the wheel and secured hy holts at the joints. The huckets, 32 in number, are nailed to the outside of the rim-bosrd. They nre 8 inchee high hy 2$\frac{3}{4}$ inches wide where the water strikes nt n right nngle or taogentially to the wheel. Short boards were afterward added to the buckets to better retnin the water. The accompsnying sketch (Fig. 2) will show the general arrnngement of the wheel and buckets.

The water was conveyed in n pipe from the ditch, 560 ft. of 10-inch aod 350 ft. of 7-inch, and delivered through n "ginnt" having a 1$\frac{1}{2}$-inch nozzle of the nsual form used in hydrsulicing; taking the friction of the water in the pipe, equal to a hend of 5.6 ft., from the actual head of 155 ft., the effective head is 149.4 ft., and the velncity of the wnter issning from the nozzle will be $\sqrt{149.6 \times 8.03} = 98.2$, and takiog the coefficient of discharge for the nozzle at .98, the actual velocity of the water issuiog from the nozzle will he 96.04, or, in round numbers, 96 ft. per seoond, or 5,760 ft. per minute. To measure the power transmitted to the wheel a friction brake like that shown in Fig. 3 was used.

A wooden lever, turniog npon an iron holt 1$\frac{1}{4}$ inches diameter, was placed under the cast-iron pulley, and at the end, *A*, a hole was made in the lever vertically under the rim of the pulley and a olevis inserted; a rope 1$\frac{1}{2}$ inches diameter wss fastened to the clevis and carried over the pulley, and a weight-hox, *W*, made fast to the free end of the rope.

The distance, *F B*, was made 3 5 times that of *A F*, for the pulley having a circumference of 9.42 ft., the horse power will equal load at *B* multiplied hy nnmher of turns of pulley per minute, divided by 1,000; hence *F B* is to *A F* as $\frac{3300}{9.42 \times 1000}$ is to 1.

Tnis was done to simplify calculations while experimenting. A steel yard was euspended over the end, *B*, so as to weigh the etrain; a guide was added to prevent too mnch oscillation of the steel yard. When the hrake was first applied, the dry rope acting npon the slightly rusted surface caused considerable jerking, hut afcer it had worn smooth and was lightly tallowed, it ran remarkably steady, a 6-penny nail in the weight-hox being eufficient to "break" the scale.

The machine heing in operation and under a full head of water, gave the following results:

Firet Experiment.

Revolutions of water-wheel per minnte, 17.4; revolutions of pnlley, per minute, 52.9; reading of steel yard, 104 lbs.; and $\frac{104 \times 52.9}{1000} = 5.5$ horse power = 181,600 foot-pounds of availahle power.

Second Experiment.

The hrake was removed from the pulley, and the revolutions increased as follows: Revolutions of water-wheel per minute, 26.2; revolutione of pulley per minute, 79.3. Hence it nppears that friction of machinery and resistance of the air have ahsorhed all of the work at this speed.

Third Experiment.

A spring halance was applied to the center of the huckets, and the wheel pulled slowly around. The average reading gave 7.16 lbs., and $7.16 \times 128 = 916$ foot-pounds ahsorhed by friction for one revolution of the wheel.

The force with which the water strikes the wheel ie that due to the difference of velocity of the wheel and the water; this force multiplied hy velocity of wheel will represent the work.

The velocity of the water, 5,760 ft. per minute, divided hy the girth of wheel, 128 ft., gives 45 revolutions aa the theoretical speed. The relntive amonnt of work for N turns per minute is (45 – N) N.

For the first experiment, this gives (45 – 17.4) 17.4 = 480. For the second experiment, this gives (45 – 26.2) 26.2 = 493. Of the power transmitted to the wheel, one portion is ahsorhed as friction nf the machinery; another portion in overcoming the resistance of the air, and the remainder appears as availahle work. As the resistance of the air increases as the equare of the velocity, the work ahsorhed will increase as the cube. The friction of the machinery increases dlrectly ae tbe velocity. Putting X equal to the foot-pounds ahsorhed at one revolntion per minute of the water-wheel, the following eqnations can he formed: $17.4^2 X + 17.4 \times 916 + 181,600 = W = 5.068X + 197,440$ = (Eq. 1). $26.2^2 X + 26.2 \times 916 = W = 17,986 X + 24,000$ = (Eq. 2). To make equality hetween the equations, the first mnst he multiplied hy $\frac{17986}{17563} = 1.026$, from which X is found equal to 14.11 foot-pounds. Substituting this value of X in equation (1), $5,268 \times 14.11 = 74,330$ F P, lost by resistance of the air against the wheel.

The total power developed is:

Friction of machinery	15,940 F. P.
Resistance of the air	74,330 "
Availahle work on the brake	181,500 "
Total work developed	271,770 F. P.

The power developed at N revolutions is K (45 – N) N. To find K, make it equal to $\frac{271,770}{(45 - 17.4)\,17.4} = 565.9$.

The availahle work for N revolutions will he in foot-pounds: $W = 566 (45 - N) N - 14.11 N^3 - 916 N$, this expanded, is $25,470 N - 566 N^2 - 14.11 N^3 - 916 N$; and to find the mnximnm value of W, its first differential co-efficient mads equal to zero is $42.33 N^2 + 1,132 N = 24,554$, and N = 13 34. Substituting this value in the finsl eqnation, the following qnantities are found:

Friction of machinery	12,220 foot-pounds
Resistance of the air	33,500 "
Availahle work	193 330 "
Total	239,050 foot-pounds

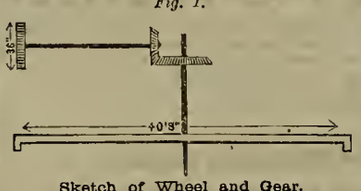
The watsr conenmed in one minnte is 70.6 cobic feet, or 4,390 lbs., and $149.4 \times 4,390 = 657,900$ foot-pounds. The available work, 193,330, divided hy 657,900, gives 29.4% as the maximum useful effect of the wheel. By reducing it to a proper size, so as to dimioish resistance of the air, and also, to admit of higher speed, ahout 40% conld he obtained.

A Curious Ore Separator.

A mnn named Sanders, in Philadelphia, hae invented a separator for ore which is of rather cnrious constructioo. He hne a vertical cylinder in which is a vertical shaft, this shaft extending only half way down, and hearing on a central post in the cylinder. On the shaft are hladee or paddlee, two or more in number.

The hottom of the cylinder below the shaft is

Fig. 1.

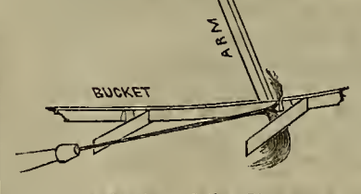


Sketch of Wheel and Gear.

divided into compartments hy means of radial partitions, the nnmher of the partitione depending upon the nnmher of snhstances to he separated. The partitions are arranged to he movahle in order that the nnmher of compartments can he regulated. A hopper is placed above into which the ore can he poured.

The cylinder ie filled with water, and hy snitable mechanism the shaft is revolved with

Fig. 2.



A Section of the Rim.

its paddles at a uniform velocity. This rotation causes the water to revolve. Then the material to he separated is fed through the hopper. Previous to feeding, the material is hrought to a uniform size by screening.

The material, when it strikes the rotatiug liquid, will fall through it in a descending spiral. The pieces having the greatest specific gravity will descend at the least angle from the perpendicular, conseqnently reaching the top of the partition nearer to the vertical from the hopper than the piecee which have less specific gravity. The position of the hopper is so arranged that the descending piecee will divide properly at one of the partitions.

After the separated materials have reached the top line of the partition they will descend to the hottom, and may he removed from the compartments hy opcninge at their hottome.

CALIFORNIA PIONEERS.—At the annual election of the Society of California Pioneers, the following officers were elected: Pres., Joseph G. Eastland; Vice-Pres'ts., John F. Lohse, of San Francisco, Ethelhert Burke, of San Francisco, Lansing B. Mizner, of Benicia, Charles Harrison, of Oakland, and Thomas H. Laine, of San Jose; Sec'y, Ferdinand Vassanlt; Treas., Howard Havens; Marshal, William Huefner. Directors, Washington Bartlett, Geo. B. Bradford, Joseph Britton, George S. Evans, John G. Hodge, S. W. Holladay, F. W. Macondry, Samuel P. Middleton, Jamee Phelan. The Territorial Pioneers of California have elected the following officers: Pree., William T. Garratt; 1st Vice-Pres., William Pearson; 2d Vice-Pres., Matt. D. Carr; Sec'y, Lowell J. Hardy, Jr.; Treas., Robert Dinsmore; Marshal, Robert Bell. Directors, Capt. C. Nelson, John W. McCormick, Sol. D. Brastow, J. W. Wesson, Samuel Figel, Domingo Marcucci, Dallas A. Kneass, C. H. Reynolds, Ely I. Hntchinson, Jr., Benjamin B. Stanshnry and David Stern.

A Promising Mine.

EDS. PRESS:—The annexed report on a mine in Tulsre county is addressed to us hy a well-known mining man of considerahle experience in mining and mill matters in this State. We agree with him that it is earnestly to be desired that California capitalists shall aid in the development of mines in this State; hut, as our correspondent intimates in his commnnication, there seems to he an infatnstion to seod capital to distant localities, such ae Alaska, where it takes the riek of elemental strife, or to invest in Mexico, where Apache raids endanger property, rather than seek for legitimate mining hnsiness nearer home.

While capitaliste are seeking investments in Arizona, Mexico, Alaska, Idaho, etc., maoy promising mining regions in Cnlifornia have remained nnexplored. Recently, however, a company was formed in San Francisco, called the "Delano G. & S. M. Co.," composed of prominent oitizens of San Francisco, who have expended considerahle money in sinking and providing necessary machinery to sink shafts, etc., and partially develop their mine.

Comfortahle housee have heen erected for the accommodation of minere, and the necessary structures for carpenter and blacksmith-shope, etc. The locality has great advantages, heing in Tnlare county, ahout 26 miles north of east of Delano, a etation on the S. P. R. R., ahout 12 hours travel from Snn Francisco. The roads leading to and from the mine in all directions are exceptionally good. Wood is ahundant and cheap. Average tahle snpplies are purchased lower than in San Francisco. The climate ie delightful.

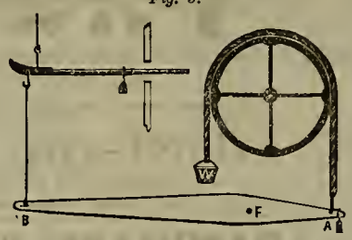
Adjoiniog the Delano are extensions north and south, in which several leading merchants in San Francisco are interested, and who are only awaiting developments in the Delano to put up works and develop their claims. Active operations are in contemplation on these extensions. Originally an incline was sunk on the ledge to a depth of 43 ft., showing the presence of ore the entire distance, varying in width from 4 inches to 18 inches.

A vertical shaft was afterward snnk to the west of the ledge to a depth of 75 ft., when a crosscut was run east and to the ledge (18 ft.), when drifts were rnn north and south, on the vein, aggregating 45 ft., aod were only diecontinued for the purpose of concentrating the lahor at the etraight shaft; the extremes of the drifte showing the same character and quality of ore as is exposed in the incline.

In the meantime, the incline was sunk to a depth of 75 ft. from the surface, showing an unmistakable ledge formation, carrying quartz the entire distance.

The extent of the ore body, laterally, has never

Fig. 3.



heen determined, as only 45 ft. (in the drifts) have ever heen explored, hut the samples have been assayed and show that they sre as rich as in the upper drift.

The ledge matter is ahout four ft. wide, *i. e.*, clay, decomposed quartz and rich paying quartz. In other words, cbaracteristic of all permanent, valuable ledges.

The inclination of the ledge in the incline for the firet 43 ft. is ahout 45 degrees, the deeper the incline, less the inclination. The quality of quartz is of unusual richness, assays varying from $36 to $915.

By continning the present levels north and south, and assuming that the ledge continues for 60 ft. farther in a lateral course, a large amount of quartz can be extracted from such levels to the surface.

The shaft has heen sunk 105 ft., and has cut the ledge vertically, which exhihits very rich ore, the vein widening.

Possihly the tendency of the ore to the south at this point may make it necessnry to run a drift a few feet to encounter the same quality of quartz as exists 25 ft. ahove.

Up to the present time all work done has heen essentially "dead work," so called in mining parlance. The mine is now in a condition, however, to extract ore from and ascertain the extent and character of its depoeits.

No difficulties are encountered in mining, as the mine has ample machinery, pumps, etc., to keep it dry and extract ore at minimum figuree. The ledge matter is soft and yielding, and rapid progress can he made in drifting and stoping. By making connection hetween the incline and drift, the facilities for working would be still furtber increased. The distance is hut a few feet. Contemplated as a mine of encouraging promise and prospective value, it certainly poeseeses great importance.

THE Butte (Montana) *Miner* appears in an enlarged and much improved form. The rapid growth of Butte as a rising nnd prosperous mining center hae called for corresponding growth of the *Miner*.

A Gift to the University.

The following letter from D. O. Mills Esq., who has just resigned ns a member of the Bonrd of Regents of the University of California, explains itself:

SAN FRANCISCO, July 7, 1881.

To the Board of Regents of the University of California:

GENTLEMEN—My interest in the institution over which you preside, and a desire to contribute to the benefit and support of good learning, prompt me to propose to you the establishing of a permauent fonndation in the natnre of a trnst fnnd, of which the income shall he applied to the maintensnce, in the University of California, of a Professorship of Intellectusl and Moral Philosophy and Civil Polity. The sole condition that I ehall impose npon thie trnst and foundation is that the income only shall he devoted exclusively to the support of thie professorship, and that any surplus shall be added to the origioal fund. While I propose to commit this trust to the keeping of the Regeuts of the University, confiding in their wisdom to direct it to the promotion of the studies to which it is dedicated, and to the steady increase of human thought and progress, and wonld limit it hy no narrow boundaries of transient opinion, I desire to record my viewe ae to tbe nnture of thie professorship, and the character of the man who ehould he called npon to discharge its duties.

The studies included nnder the general title pertain especially to msn—his intellectnal moral and social heing—and can never cease to hold a high place in human learning, nor to have great influence on human welfare. In the widest and most liheral meaning they underlie lawe, manners and religion, and in effect form the pnhlic opinion of the world, and their teacher ehonld not he one who merely resorte to them, picks them np, or incidentally adopts them, hnt one of philosophic spirit who shall devote his life to this appropriate field of influence and nohle lahor. To snch a man this professorship offere opportunities limited only hy hie own genine and devotion. For the above pnrpose I inclose herewith my check for the sum of $75,000, and will he ohliged if the Board will signify to me the acceptance of the trust. Hoping that thie may result to the advantage of the State and to the University, I remain, gentlemen, very respectfully,

D. O. MILLS.

This gift comes at an opportune time in tbe affaire of the University, and its friends will feel grateful to Mr. Mills, hoth for his generosity and his timely application of it. On receipt of the gift, the Regents passed nppropriate resolutions, one of which was as follows: That in recognition of the living interest and hroad viewe of the donor, the Professorship thus endowed ehall bear the name and title of the Mill Professorship of Intellectual and Moral Philosophy and Civil Polity, and that the wishes of Mr. Mills shall he consulted in the appointment of the first Professor.

Ore Concentration.

Messrs. Alvinza Hayward and Wm. T. Hobart are about to erect a 40-stamp mill on the Pacific mine at Plymouth, Amador county, adjoining the well-known Empire mine. They have ordered of Adams & Carter 16 Frue concentrators to go with their mills. Messrs. Hayward and Hohart were decidedly prejudiced in favor of the huddle, as they had thoroughly tested that system of concentration snd perfected it at the Empire mill, which they formerly controlled. This strong prejudice was overcome finally, after careful examination of the Frue concentrators, which these well-known and careful mining men now use instead of the buddle.

Four of these concentrators are going to the Fresno Enterprise mill, a new 10-stamp mill at Fresno Flat in that county.

Two have also gone to South Mountain, Idaho, for the Varkuff Mining, Smelting and Milling Co., a New York organization. This company is composed of New York capitalists and Utah lead smelters. They propose to work up the galena ores in South Mountain, near Silver City, Idaho. That section of the country contains a great deal of mineral wealth, hut heretofore it has not been very successfully worked, owing to the low grade of the ores. It is to he hoped that the new system of concentration, hy Frne machines, will help the miners out.

There is no question hut that in many districts on this coast, systems of concentration must he adopted before the ores can he profitably worked. There are many localities where the low grade of the ores prevents the construction of mills for working them. If, however, it can he possihle to concentrate these ores to douhle the richness, at half the cost of what the milling of an equal quality would he, then the ores can often he made to pay.

We have not until of late given any attention of moment to the matter of ore concentration. Now we are finding out that it pays to get rid of a lot of worthless gangue hefore treating the ores further.

This has been proven thoroughly in other sections. In places where ores are to be shipped, methods of concentration can always he profitably employed. Ten or 15 tons of ore can he reduced to one, and thie one shipped. In other conntries this is done more than it is here; hut we are fast learning economies in mining which experience has taught older communities.

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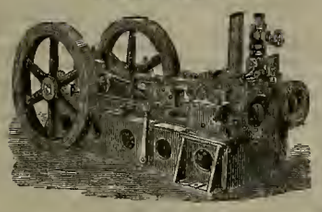

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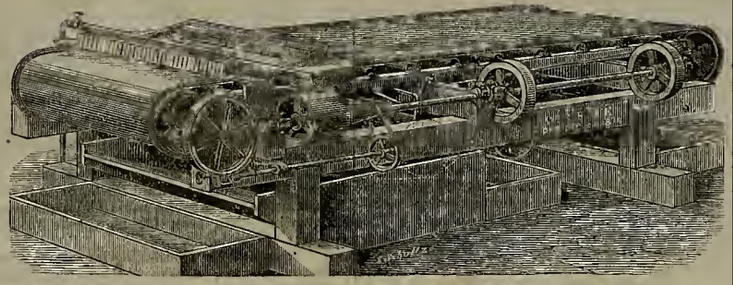

THE FRUE ORE CONCENTRATOR.

Over 250 are now in use, giving entire satisfaction. Awarded First Premium and Silver Medal at the Industrial Fair for 1880 of the Mechanics' Institute of San Francisco, Cal.

Saves from 50 to 100 per cent. more than any other Concentrator in use, and the concentrations are clean from the first working.

The wear and tear are merely nominal; the water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.

We challenge any other Concentrator in use for a fair and impartial competitive trial, side by side, for stakes of $1,000 each, and we mean business.

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THE CALIFORNIA POWDER WORKS.

MANUFACTURERS OF

Sporting, Cannon, Mining, Blasting and

HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 XX is the Strongest Explosive Known.

No. 2 is superior to any powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.

JOHN F. LOHSE, SEC'Y.

Office, No. 230 California Street - - San Francisco, Cal.

GIANT POWDER

MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS.

Nos. ONE, TWO and THREE.

Stronger, Better and Safer than any other High Explosive

Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. Triple Force Caps and all Grades of Fuse.

BANDMANN, NIELSEN & CO.,

SAN FRANCISCO, CAL.

Excelsior Blasting Powder,

—MANUFACTURED BY—

THE EXCELSIOR POWDER COMPANY.

This is no NEW PATENT NON-EXPLOSIVE SAFETY POWDER, but the GENUINE STANDARD ARTICLE, and as safe to use and handle as any Nitro-Glycerine Powder manufactured. The Fumes and Gases, common in other Nitro-Glycerine Powders, are almost destroyed, and do not leave the miner with headache or nausea. Among the numerous recent testimonials the following is but a fair sample, constantly received, attesting the superiority of EXCELSIOR POWDER:

AUBURN, Cal., May 26, 1881.—EXCELSIOR POWDER CO.: I send you, per Wells, Fargo & Co., a box containing samples of country rock through which I am running our tunnel on the Conrad Mine, and through which we have now run 425 feet, 2.5 feet of it having been done with EXCELSIOR POWDER. If any one can produce harder rock I would like to see it. I here say that I can do more execution with your No. 2 Powder in this rock than I can with any No. 1 Powder of any manufacture I have ever used, and I have used every kind now manufactured here, excepting "Tonite," and I have had 20 years' experience in blasting. Respectfully yours,

E. W. ROBERTS, Superintendent.

Give this Powder a trial and you will use no other. For Strength and freedom from noxious fumes, it has no equal. Address all orders to EXCELSIOR POWDER CO., No. 330 Pine Street, Rooms 53 and 54, Academy Building, San Francisco, Cal.

VULCAN BLASTING POWDER.

—THE MOST ECONOMICAL AND BEST—

Nitro-Glycerine Explosive in the Market.

In the suit of the Ciant Powder Co. against the Vulcan Powder Co. for *alleged* infringement of Patent, it was held that the Ciant Powder Patent was INVALID.

Nos. 1, 2 and 3 Vulcan,

Each grade superior to like numbers of any other Nitro-Glycerine Powder in the market.

VULCAN B. B.,

Superior to Black, Judson or any low grade Powder for Bank Blasts, Railroad work, or any work where Black Powder has been herctofore employed.

TRIPLE FORCE CAPS AND ALL ORADES OF FUSE.

The CONSUMER'S COMPANY sell the best Powder at the lowest rates.

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Boarding and Day School for Boys and Young Men.

Classical and English Courses.

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REV. EDWARD B. CHURCH, MISS MARY B. COCHRANE, } Principals.

CALIFORNIA MILITARY ACADEMY,

AT OAKLAND.

The next term will begin on

Monday.....July 18, 1881.

REV. DAVID McCLURE, Ph. D.,

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27TH TERM BEGINS

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This institution offers to a limited number advantages of the highest order, having a large corps of well-known teachers who give individual care and treatment to each pupil. Address MRS. L. MANSON-BUCKMASTER, San Mateo, Cal.

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[Formerly Chief Assayer with Thos. Price.]
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ASSAYING TAUGHT.

☞Personal attention insures Correct Returns.☜

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Near First and Market Streets, S. F.
ESTABLISHED, 1869. C. A. LUCKHARDT, Manager.

Ores Worked by any Process.
Ores Sampled.
Assaying in all its Branches.
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Working Tests (Practical) Made.
Plans and Specifications furnished for the most suitable process for working Ores.
Special attention paid to Examinations of Minee, plans and reports furnished.

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Mining Engineere and Metallurgists

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CHEMICAL APPARATUS AND CHEMICALS, DRUGGISTS' GLASSWARE AND SUNDRIES, Etc.
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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
☞Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.

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Assaying and Metallurgy of Silver taught theoretically and practically.
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Manufacturers of
THE PATENT CHANNEL IRON WHEELBARROWS.
THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand

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Lap-Welded Pipe, all Sizes, from Three to Six Inches. Artesian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.
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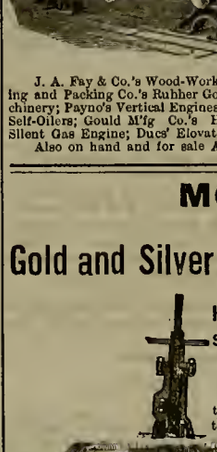
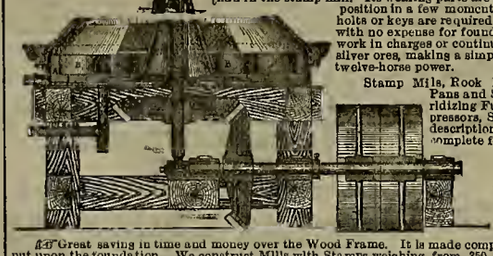
Gold and Silver Grinding and Amalgamating Machinery



HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.

IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.



Stamp Mils, Rook Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies Iron Work complete for Wood Frames, also

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☞Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.

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PRICES REDUCED!
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The "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.
Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
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FROM 1-4 TO 10,000 lbs. WEIGHT.
True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
CRANK SHAFTS, SHOES, DIES and GEARING specialties.
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IRRIGATION! LAND RECLAMATION!
The Turbine Pumps.
3,000 to 15,000 Gallons a Minute. Strong, Durable & Cheap.
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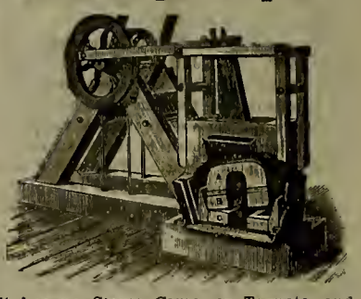
Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent.

HUNTINGTON'S Oscillating Stamp Mill



It has no Stems, Cams, or Tappets, and Adjusts Itself to the Wear of the Shoes and Dies.
For Simplicity, Economy, Durability and Effective Working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power.

Price, 900-Pound Hammer, - - -	$500.
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DuBOIS' Automatic Quicksilver Feeder.
A machine for feeding quicksilver to the mortars of GOLD MILLS. It is so connected to the cam shaft, that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a mechanical movement, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding ordinary hand-feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect. Price complete, $100.00. Send for circular.
P. C. DuBOIS,
18 Fremont St., S. F.

ST. DAVID'S.
A FIRST-CLASS LODGING HOUSE
CONTAINS 118 ROOMS.
716 Howard St., near Third, San Francieco.
This House is especially designed as a comfortable home for gentlemen and ladies visiting the city from the Interior. No dark rooms. Gas and running water in each room. The floors are covered with body Brussels carpet, and all of the furniture is made of solid black walnut. Each bed has a spring mattress, with an additional hair top mattress, making them the most luxurious and healthy beds in the world. Ladies wishing to cook for themselves or families, are allowed the free use of a large public kitchen and dining room, with dishes. Servants wash the dishes and keep up a constant fire from 6 A. M. to 7 P. M. Hot and cold baths, a large parlor and reading room, containing a Grand Piano—all free to guests. Price single rooms per night, 50 cts.; per week, from $2.50 upward s
R. HUGHES, Proprietor.
At Market Street Ferry, take Omnibus line of street cars to corner Third and Howard.

OTTOKAR HOFMANN,
(Of the Firm of Hofmann Bros.)
Metallurgist and Mining Engineer.
Erection of Leaching and Chlorination Works a specialty
Working Tests and Reports made.
416 MISSION STREET, SAN FRANCISCO.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.

FOR THE WEEK ENDING JULY 5, 1881.

243,700.—VENTILATOR—W. T. Cottier, Napa, Cal.
243,801.—MAGAZINE FIRE ARM—A. Schneider, S. F.
243,814.—STEAM PUMPING ENGINE—Thompson & Evans, S. F.
243,818.—CORSET—Mrs. C. V. Nicola Valley, B. C.
243,715.—COMBINED HEADER AND THRESHER, A. H. Lightlhall, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

MAGAZINE FIRE-ARM.—Alois Schneider, 24 Erie street, S. F. Dated July 5, 1881. No. 243,801. Mr. Schneider's invention relates to certain improvements in these fire-arms which have a magazine for containing a series of cartridges in line; and it consists in a means of preventing the cartridges within the magazine from reeting upon one another, whereby the daoger of explosion may be avoided. The invention is applied to any form of magazine in which the cartridges lie in line, one above another, as in the ordinary form. Mr. Schneider has made several valuable improvements in fire-arms, being an inventor of great skill and ingenuity in this line, and a mechanical expert as well. Amoog other things, he has patented an excellent method of converting muzzle-loading rifles into breech loaders by simple means.

LUBRICATOR FOR CYLINDERS OF AIR COMPRESSORS.—R. F. Grigsby, Rosario, Mexico. Dated July 5, 1881. No. 243,773. This invention is fully described in another columo of this number.

CORSET.—Christiana V. Turner, Nicola valley, British Columbia. Dated July 5, 1881. No. 243,818. The invention relates to that class of corsets, the novelty in which consists in a peculiar construction of sections, cut in shape and form of particular dimensions, said sections, when united, forming a corset which will exactly fit the wearer, and which, by reason of its construction, will especially fit the hips better, and render a better support for the back than corsets, as ordinarily made. Having the general shapes of the sections, any appropriate system of measurement may be applied to make the corset fit different bodies.

VENTILATOR.—Wm. T. Cottier, Napa. Dated July 5, 1881. No. 243,760. The object of this invention is to provide a means of ventilation for chimneys, vaults, water closets, rooms, buildings, urinals, cars, ships, sewers, or any places where impure air or foul gases are liable to generate. It consists in providing a chimney, tube or shaft with supplemental induction tubes, the openings of which communicate with peculiarly formed air-concentrators, by which the currents of air are directed into the said induction tubes, inside the chimney stack or tube, without the use of movable directors, whatever be the direction of the wind. The currents of air entering these induction tubes, and passing upward, tend to draw up, by induction, the gases or foul air below and ventilate the space or chamber with which the chimney flue or tube is connected. This space the inventor calls the vomitorium and it is adapted to receive the foul air from the sower, room or other place to be ventilated and deliver it into the flue.

MORE NEW MINES.—Saye the *Silver State:* Some very promising mines are being discovered along the Idaho road, in the vicinity of Willow creek. The French boye, according to all reports, have found a large ledge on Rock creek, south of Willow creek, and Chas. Siekron hae discovered a very valuable mine, about eight milee northeast of Willow Creek station. The ledge, which crops out nearly the whole length of the claim—1,500 ft.—is from three to eix ft. wide on the surface. The discoverere have run a drift 40 ft. on the vein, and have taken out about 20 tone of good ore. The ledge has been named the Comstock, becauee the ore resembles that of the great mine of that name in Virginia City. There is plenty of water and timber near the mine, at the head of the south fork of Flat creek.

IDAHO YIELD AND DIVIDEND.—The yield of the Idaho mine for the month of June wae $56,000. The usual dividend of $7.50 per ehare, amounting to $23,250, has been declared and paid. This makee the 143d regular dividend paid hy the company, amounting iu the aggregate to $2,985,300, out of a total product of a little above $6,500,000.

VOLCANO, Amador, hae ehipped over $20,000,000 in gold since 1849.

The Industrial Fair.

A full meeting of the Board of Managere of the Mecbanics' Inetitute fair was held on Tueeday evening laet. It was reported to the meeting that all the main floor-epace of the entire pavilion has already been applied for and awarded, and the aeeurance ie now perfect that this department of the great exhibition will be far more inclueive and complete than at any preceding fair. Ae it has been determined that the coming exhibition ehall eurpase all preceding ones, so it hae aleo been determined that the fitting of the pavilion ehall correepond with such increaeed excellence. All the preeent decorations, many of which have become entirely too familiar, are to be removed, and new, artistic and coetly decorations are to be eubetituted. The eeaeon checke and the tickete of admiseion to the exposition are to be printed at once, and will be immediately put upon eale at varione convenient places throughout the city. The garden and the grasees and flowere will, perhaps, show a more radical excellence over preceding yeere than even the exhibite on the main floor. More floriete have applied for epace than ever before, and each applicant will make a fuller and more varioue ehowing than any exhihitor hae yet done. A epecialty thie year in thie department will be of tropical trees and plante and of the treee and plante of the eemitropical Southern California.

It hae heen decided that the art gallery of the Expoeition ehell be a new and deeirable departure from this department, ae heretofore managed. The details were reeerved for decieion at the next meeting, bnt it is already certain that the art exhibit will be a complete exhibition of itself. Both the Mieeion and the Market-street entrances to the Pavilion are to be kept upen for the accommodation of vieitore. The fair will be opened on the night of Tueeday, the 2d of Auguet next.

News in Brief.

THE Tombstone mines produced in Jnne $529,000.

IN a financial point of view, Griscom's fast at Chicago hae proved a failure.

THERE are eome 200 men employed on the Nevada and Oregon railroad.

BATTLE MOUNTAIN'S arteeian wells are making that vicinity a garden epot.

WORK hae been reeumed to complete the new Mint refinery building at Careon.

THE run of ealmon ie increasing at Aetoria. The run in Frazer river hegan July 10th.

During the week ending the 8th inet 23 deathe from yellow fever occurred in Havana.

THE firet locomotive for the California Southrailroad has arrived at San Diego per the brig *Orient.*

A CHUNK of eolid gold, weighing $65.75 was picked up last week in the Ward mine Trinity county.

THE country above Cloverdale is filled with campers from San Francieco, Oakland and other lowland placee.

THE machinery for the new rolling mille at the railroad ehope in Sacramento is rapidly approaching completion.

THE California Hosiery Company, Oakland, now employe abont 220 hande, and is kept hnsy filling ordere for Uncle Sam.

AN effort will be made to bridge the Sacramento river at Chico this fall, or as early in the coming spring as practicable.

THERE are millione of catfieh and perch now in Washoe lake, but they will not he fit for table uee until a year from this time.

THE London eeaeon has thue far been uneually quiet. Kelakana, King of the Sandwich Islands, ie the fashionahle lion and goee everywhere.

ENGINEERS are making eurveye for fortificatione at Victoria and Esquimalt. The Imperial government intends to make Eequimalt barbor impregnahle.

SIR SAMUEL and Lady Baker are vieiting Webber lake and vicinity. They are famoue travelere, and have been in almoet every country of the habitable globe.

ACCORDING to the aseeesment roll the total value of all property, real and pereonal, in Tulare county, ie $7,845,610, being an increase of $1,307,822 eince last year.

MYERS, of the Manhattan Athletic Clnh of New York, rao a quarter-mile raoe at Birmingham, Eng., Satnrday, in 49 eeconde, beating the Englieh recorde and his own.

A TRACT of 120,000 acres of land in San Bernardino county has just been purchaeed by a capitalist, and ie now being out up into emall farms and put on the market.

MILLIONS of saw-loge are being rafted, and tbousande of railroad tiee are being loaded for ehipment up the Columbia river from Cowlitz county, Waehington Territory.

THE body of T. K. Pugh, eon of ex-Senator Pugh, who wae made captive recently in Chihuahua by Apaches, bae been fonnd horribly mutilated, and hearing evidence of torture before death.

THE Russian Minister of War proposee to diecontinue the construction of fortificatione on the German and Auetrian frontiere, begun by his predeceeeor, eaving 10,000,000 rubles in the budget.

THE *Bee* eaye there ie a Chinese firm in Sacramento engaged in packing and shipping frnit and vegetables to the interior. It employe eome white boye in the bneinees, and is paying them good wages.

TONITE.—The Grase Valley *Union*, speaking of the recent explosion of powder at Tucson, which was at firet attributed to Tonite, until it was found there were seven kinds of powder in one room, and a lot of caps in the other, there being but two roome in the buildings, saye: "Ae to Tonite powder being an effective and eafe exploeive, it may be etated that it has been (in connection with black powder) in general uee in the Idaho mine of thie district, since about the firet nf laet January, and has given eatisfaction in every reepect. It etande in high favor witb the Superintendent of the mine and all of the workmen. No accident has occurred from its use, and the general regularity of ite effects and efficiency demonstrate that it undergobe no chemical changee that render it uncertain or nnsafe. Like the dynamite powdere it emits fumee upon exploeion that are disagreeable in a cloee drift but theee paee off readily in a few minntes, so that no unpleasant effects are prodnced npon the workmen. Mining men understand that the Idaho is one of the moet extensively worked minee in the State, employing a large force of men, and that if the Tonite powder ie a dangerous exploeive ite nee in the hands of eo many persons would have before thie time shown its bad or treaoheroue qualitiee, and the Superintendent, Mr. Coleman, now considers himeelf justified in regarding it as among the most valuable explosivee, and without depreciating thoee that are aleo in general uee, gives it the preference. It cennot be eaid of the Tonite that it is behind the age. In fact it ie up witb the times. It ie extensively used in England. Ie almoet exclueively ueed by that government for torpedoes in the naval eervice, and ite consumption ie largely on the increase throughout all the mining regions of the Pacific coaet."

ASKING FOR A REDUCTION.—All the hydraulic mining companiee in Nevada county have petitioned the Board of Supervisore for a reduction of their aseeeemente to the amount of 66⅔%. The applicatione are made on acconnt of injunctions in force and threatened by which the mining properties will he greatly depreoiated in value. The Supervieore will give full hearing and concideration to theee applicatione before taking action. The reduction asked for, if allowed, will make a very conoiderahle deorease in the aggregate assesement of the county.

THE Denver & Rio Grande are reported to have ordered a hundred locomotives for the Utah divieion of their line.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and ecience, by aselsting Agents in their labors of canvassing, by lending their influcuce and encouraging favors. We intond to send none but worthy men.

J. F. OSBORNE—San Francieco.
A. C. KNOX—Napa and Lake coantics.
O. W. MCCABE—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuba and Sutter countiee.
D. W. KELLEHER—Solano and Sacramento countlee.
ORO. W. FAHRION—Plumas county.
GEO H. HOPKINS—Amador county.
A. LEONARD MEYER—Utali and Idabo Ter.

IMPORTANT additione are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions ie increased and there is a better chance to study their actions. The pavilion has new varietiee of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardene is a day well epent.

PERSONS receiving a eample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and cousider fairly its claims for support, and if consistent, subscribe for the paper tbrough the P. M. or agent delivering it, or otherwise. We will send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do eo.

ANDERSON SPRINGS, in Lake county, 19 milee from Calistoga (over a grand, picturesque route, via Mt. St. Helena) are among the best in this State. They are situated in the midst of a natural park, full of beauty and interest to the naturalist. Good home-like accommodatione at reasonable rates are invariably furnisbed by the Andereon family.

HOW TO STOP THIS PAPER.—It is not a difficult task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the eubecriber wante it etopped. So be sure and send us notice by *letter.*

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus, terms of subscription, etc., and request that they circulate the copy sent.

THE State Mining Bureau, No. 313 Pine street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francieco.

COPP'S "U. S. MINERAL LANDS, LAWS, FORMS, INSTRUCTIONS AND DECISIONS."—1881. 570 pp. In full law binding, $4.50; half law binding, $3, at this office.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F.D., at this office.

Metals.

[WHOLESALE.

WEDNESDAY, July 13, 1881.

IRON.—			
American, Pig, soft, ton	—	@	30 00
Scotch, Pig, ton	26 00	@	28 00
American White Pig, ton	—	@	—
Oregon Pig, ton	—	@	26 00
Refined Bar	4½	@	8
Horse Shoes, keg	7 00	@	8 00
Nail Rod	—	@	9½
Norway, according to thickness	8½	@	9½
STEEL.			
English Cast, lb	16	@	18
Black Diamond, ordinary sizes	13	@	15
Drill	9	@	10
Flat Bar	—	@	16
Plow Steel	9	@	10
COPPER.—			
Ingot	—	@	52
Sheet	—	@	20
Sheating, Tinned 14x18	—	@	42
Nails	—	@	—
Bolts	38	@	42
Old	—	@	18
Bar	—	@	22
Precipitate, 100 fine	18	@	19
LEAD.—			
Pig	4½	@	4½
Bar	—	@	6
Pipe	—	@	8
Sheet	—	@	9
Shot, discount 10% on 500 Bags			
Drop, per bag	—	@	2 10
Buck, "	—	@	2 30
Chilled "	—	@	2 50
TIN PLATES.—			
10x14 I O Charcoal	—	@	8 00
10x14 I O Ooke	—	@	6 50
Banca Tin	—	@	25 00
Australian	—	@	22 00
I. C. Charcoal Roofing 14x20	—	@	7 25
" " " 20x28	20 00	@	21 00
ZINC.—			
By the Ossk	—	@	9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	—	@	10
NAILS.—			
Assorted Sizes	3 50	@	3 75

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

ANNUAL MEETING.

Spring Valley Water Works,

SAN FRANCISCO, JULY 7, 1881.

The Annual Meeting of the Stockholders of the Spring Valley Water Works, for the election of Trustees for the ensuing year, will be held at the office of the Company, 516 California street, on WEDNESDAY, July 20, 1881, at 12 M.

WM. NORRIS,
Secretary.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company,

SAN FRANCISCO, JULY 8, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 19), of Twenty-five (25c) Cents per share was declared, payable on FRIDAY, July 15, 1881, at the office of the Company, Room 19, No. 328 Montgomery street, San Francisco, California. Transfer books will be closed on July 11, 1881.

JOSEPH NASH, Secretary.

REGULAR DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

SAN FRANCISCO, JULY 9, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 48), of Fifty (50c) Cents per share was declared, payable on FRIDAY, July 15, 1881. Transfer books closed on Monday, July 11, 1881, at 3 o'clock P. M.

WILLIAM WILLIS, Secretary.

Office—Room No. 29, Nevada Block, No. 309 Montgomery street, San Francieco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

SAN FRANCISCO, JULY 9, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, an Extra Dividend (No. 49), of Twenty-five (25c) Cents per share was declared, payable on FRIDAY, July 15, 1881. Transfer books closed on Monday, July 11, 1881, at 3 o'clock P. M.

WILLIAM WILLIS, Secretary.

Office—Room No. 29, Nevada Block, No 309 Montgomery street, San Francisco, Cal.

Arizona Mexican Mining Company.—Lo-

cation of principal place of business, San Francisco, California. Location of works, Globe District, Arizona Territory.

NOTICE.—There are delinquent upon the following described stock, on account of assessment No. I, levied on the Seventh (7th) day of June, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amount
G R Johnson	180	40900	$24,950 00
O R Johnson, trustee	146	1000	500 00
G R Johnson, trustee	147	1000	500 00
O R Johnson, trustee	148	1000	500 00
G R Johnson, trustee	149	1000	500 00
G R Johnson, trustee	150	1000	500 00
O R Johnson, trustee	151	1000	500 00
O R Johnson, trustee	152	1000	500 00
O R John on, trustee	153	1000	500 00
O R Johnson, trustee	154	1000	500 00
G R Johnson, trustee	155	1000	500 00
O R Johnson, trustee	156	500	250 00
O R Johnson, trustee	157	500	250 00
G R Johnson, trustee	158	500	250 00
G R Johnson, trustee	159	500	250 00
O R Johnson, trustee	160	500	250 00
O R Johnson, trustee	161	500	250 00
O R Johnson, trustee	162	500	250 00
O R Johnson, trustee	163	500	250 00
O R Johnson, trustee	164	500	250 00
O R Johnson, trustee	165	500	250 00
O R Johnson, trustee	166	500	250 00
O R Johnson, trustee	167	500	250 00
O R Johnson, trustee	168	500	250 00
G R Johnson, trustee	169	500	250 00
O R Johnson, trustee	170	500	250 00
G R Johnson, trustee	171	500	250 00
O R Johnson, trustee	172	500	250 00
O R Johnson, trustee	173	500	250 00
G R Johnson, trustee	174	500	250 00
O R Johnson, trustee	175	500	250 00
O R Johnson, trustee	176	500	250 00
O R Johnson, trustee	177	500	250 00
Geo R Adams, trustee	12	500	250 00
Geo R Adams, trustee	13	500	250 00
Geo R Adame, trustee	14	500	250 00
Geo R Adams, trustee	53	100	50 00
Geo R Adame, trustee	54	100	50 00
Geo R Adams, trustee	55	100	50 00
Geo R Adams, trustee	56	100	50 00
Geo R Adams, trustee	57	100	50 00
Geo R Adame, trustee	58	100	50 00
Geo R Adame, trustee	59	100	50 00
Geo R Adame, trustee	60	100	50 00
Geo R Adame, trustee	61	100	50 00
Geo R Adams, trustee	62	100	50 00
Geo R Adams, trustee	63	100	50 00
Geo R Adams, trustee	64	100	50 00
Geo R Adams, trustee	65	100	50 00
Geo R Adams, trustee	66	100	50 00
Geo R Adams, trustee	67	100	50 00
Geo R Adams, trustee	68	100	50 00
Geo R Adame, trustee	69	100	50 00
Geo R Adams, trustee	70	100	50 00
Geo R Adams, trustee	71	100	50 00
Geo R Adams, trustee	72	100	50 00
Geo R Adams, trustee	73	100	50 00
Geo R Adams, trustee	74	100	50 00
Geo R Adame, trustee	75	100	50 00
Geo R Adams, trustee	76	100	50 00
Geo R Adams, trustee	77	100	50 00
Geo R Adams, trustee	78	100	50 00
Geo R Adams, trustee	70	100	50 00
Geo R Adame, trustee	80	100	50 00
Geo R Adams, trustee	81	100	50 00
Geo R Adams, trustee	82	100	50 00
Geo R Adams, trustee	83	100	50 00
Geo R Adams, trustee	84	100	50 00
Geo R Adams, trustee	85	100	50 00
Geo R Adams, trustee	86	100	50 00
Geo R Adame, trustee	87	100	50 00
Geo R Adams, trustee	88	100	50 00
Geo R Adame, trustee	89	100	50 00
Geo R Adams, trustee	90	100	50 00
Geo R Adams, trustee	91	100	50 00
Geo R Adams, trustee	92	100	50 00
Geo R Adame, trustee	03	100	50 00
Geo R Adams, trustee	94	100	50 00
Geo R Adams, trustee	05	100	50 00
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Geo R Adams, trustee	111	50	25 00
Geo R Adams, trustee	112	50	25 00
Geo R Adams, trustee	113	50	25 00
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Geo R Adame, trustee	115	50	25 00
Geo R Adame, trustee	116	50	25 00
Geo R Adams, trustee	117	50	25 00
Geo R Adams, trustee	118	50	25 00
Geo R Adams, trustee	119	50	25 00
Geo R Adams, trustee	120	50	25 00
Geo R Adame, trustee	121	50	25 00
Geo R Adams, trustee	122	50	25 00
Geo R Adams, trustee	123	50	25 00
Geo R Adams, trustee	124	50	25 00
Geo R Adame, trustee	125	50	25 00
Geo R Adame, trustee	126	50	25 00
Geo R Adams, trustee	127	50	25 00
Geo R Adams, trustee	128	50	25 00
Geo R Adams, trustee	129	50	25 00
Geo R Adame, trustee	130	50	25 00
Geo R Adams, trustee	131	50	25 00
Geo R Adams, trustee	132	50	25 00
Geo R Adams, trustee	133	50	25 00
Geo R Adams, trustee	134	50	25 00
Geo R Adams, trustee	136	50	25 00
Geo R Adame, trustee	137	50	25 00
Geo R Adame, trustee	138	50	25 00
Geo R Adams, trustee	139	50	25 00
Geo R Adams, trustee	140	50	25 00
Geo R Adame, trustee	179	4000	2000 00
Geo R Adams, trustee	183	16650	8325 00

And in accordance with law, and an order of the Board of Directors made on the seventh (7th) day of June, 1881, so many shares of each parcel of such stock as may be necessary will be sold at Public Auction, at the office of the Company, room 39, No. 320 Sansome street, on Monday, the eighth (8th) day of August, 1881, at the hour of 12½ o'clock P. M., of said day, to pay said delinquent assessments thereon, together with costs of advertising and expenses of the sale.

GEO. R. ADAMS, Secretary.

Office—Room 39, No. 320 Sansome street., San Francisco, Cal.

ASSESSMENT NOTICE.

Consolidated Pacific Mining Company.

ASSESSMENT, NO. 3.

Amount	Forty Cents per Share
Levied	July 9, 1881
Delinquant	August 12, 1881
Day of Sale	September 1, 1881

F. E. LUTY, Secretary.

Office—Room 5, No. 330 Pine St., San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Co.,

Nevada Block, Room 37, San Francisco, July 15, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 60), of Fifty (50) Cents per share was declared payable on WEDNESDAY, July 20, 1881. Transfer boooke closed until the 21st instant. W. W. TRAYLOR, Secretary.

Wolverine Gravel Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Roach Hill, Placer County, California.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 2, levied on the 31st day of May, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Barnett, Miss Ellen, Trustee	12	300	$30 00
Barnett, Miss Katie, Trustee	15	200	20 00
Barnett, Miss Katie, Trustee	72	100	10 00
Berry, J. H., Trustee	13	100	10 00
Dodge, L. C., Trustee	17	1,000	100 00
Dodge, L. C., Trustee	18	500	50 00
Durning, T. G., Trustee	30	500	50 00
Hall, Edward, Trustee	32	1,000	100 00
Hall, Edward, Trustee	33	1,000	100 00
Myers, W. H., Trustee	10	2 000	200 00
Moyer, Frank, Trustee	16	200	20 00
Moyer, Frank, Trustee	44	75	7 50
Moyer, Frank, Trustee	45	100	10 00
Moyer, Frank, Trustee	71	750	75 00
Mason, H. G., Trustee	21	1 000	100 00
Tilley, W. J., Trustee	30	2,000	200 00
Teel, J. M., Trustee	64	500	50 00
Teel, J. M., Trustee	65	250	25 00
Jones, Wm.	77	500	50 00

And in accordance with law, and an order of the Board of Directors, made on the 31st day of May, 1881, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, 325 Front St., San Francisco, Cal., on Monday, the First day of August, 1881, at the hour of Two o'clock, P. M., of said day, to pay Delinquent Assessments thereon, together with costs of advertising and expenses of the sale. E. J. BLANDING, Secretary.

Office—325 Front St., San Francisco, Cal.

DIVIDEND NOTICE.

GFFICE OF THE

Standard Consolidated Mining Company,

SAN FRANCISCO, JULY 2, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 30), of Seventy-five (75) Cents per share was declared, payable on TUESDAY, July Twelfth (12), 1881, at the office in this city, or at the Farmer's Loan and Truet Compauy, In New York.

WILLIAM WILLIS, Sec'y.

Office—Room 29, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

Arizona Mexican Mining Company.—Lo-

cation of principal place of business, San Francisco, California. Location of works, Globe District, Arizona.

Notice is hereby given, that at a meeting of the Directors, held on the 7th day of June, 1881, an assessment (No. 1), of Fifty (50) Cents per share was levied upon the capital stock of the Corporation, payable immediately in U. S. Gold Coin, to the Secretary at the office of the Company, Room 39, No. 320 Sansome St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 15th day of July, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 8th day of August, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

GEO. R. ADAMS, Secretary.

Office—320 Sansome St., Room 39, San Francisco, Cal.

Steep Hollow Gold Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Liberty Hill Mining District, Nevada County, California.

Notice is hereby given, that at a meetug of the Board of Directors, held on the 21st day of June, 1881, an assessmeut (No. 6), of $1.50 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the Company, No. 310 Pine street, Rooms 15 and 17, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of July, 1881, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 18th day of August, 1881, to pay the delinquent assessment together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. W. PEW, Secretary.

Office—310 Pine St., Rooms 15 and 17, San Francisco, Cal

Certificate of Partnership.

We certify that we constitute a partnership transacting business as manufacturers and dealers in patent water closets and other sanitary goods, in the State of California. Its principal place of business is San Francisco, California; its name is Milne & Gants; the full names and respective places of residence of all its members are signed hereto.

Dated, San Francisco, July 9th, 1881.

GEO. MILNE, residing at San Francisco Cal.

WM. H. GANTS, residing at Oakland, Alameda County, California.

Duly acknowledged, July 9th, 1881, before W. H. Barton, Notary Public, in and for the City and County of San Francisco, and filed in the County Clerk's office of the City and County of San Francisco July 9th, 1881. Endorsed: Filed July 9th, 1881. WILLIAM A. STUART, Clerk.

By JOHN H. MOTT, Deputy Clerk.

NOTICE.

The office of the STETEFELDT FURNACE CO., having been removed to New York, parties wishing to obtain information in San Francisco about the Stetefeldt Furnace will apply to Messrs. Prescott, Sooft & Co., Union Iron Works, San Francisco. C. A. STETEFELDT.

JOHN EITEL,

Assayer and Chemist,

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All orders accurately and moderately carried out. (Send for Circular.)"

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SAN FRANCISCO, CAL.

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KUSTEL'S CONCENTRATION OF ORES (of all kinds), including the Chloriuation Process for gold-bearing sulphurets, arseniurets, and gold and silver ores generally, with 120 lithographic diagrams. 1867. This work is unequaled by any other published embracing the subjects treated. Post-paid, $7.50. Printed and sold by Dewey & Co., S. F.

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BALDWIN'S THEATER.

J. H. YOUNG.....Lessee and Manager.

EMANCIPATION.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

STANDARD THEATER.

CHAS. E. LOCKE.....Proprietor.

THE EMIGRANTS.

Bush Street, between Kearny and Montgomery. Open every evening and Saturday matinee. Box office open daily.

THE TIVOLI GARDENS.

KREELING BROS.....Managers

MARTHA! MARTHA!

Eddy Street, between Market and Mason. Open every evening.

BUY LAND

Where you can get a crop every year; where you will make something every season; where you are sure of having a crop when prices are high; where you have a healthy place to live; where you can raise semi-tropical as well as other fruits; where you can raise a diversity of grain and vegetables and get a good price for them. Go and see the old Reading Grant (in the upper Sacramento Valley), and you will find such land for sale in sub-divisions to suit purchasers—at reasonable rates and on easy terms. Send stamp for map and circular to EDWARD FRISBIE, proprietor, (on the Grant), Anderson, Shasta Co., Cal.

1851. 1881.

DEPUTY U. S. MINERAL SURVEYOR.

Surveys for Location or Patent. Maps and Plans Drawn. Mining Properties of all kinds examined and careful reports made of the same. Consultations on Mining Investments. Address, THOS. W. REECE, CIVIL ENGINEER, Oroville, Butte Co., Cal. References given and required.

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ECLIPSE ROCK DRILLS.

The Most Economical Air Compresseore in the Market.

MINERS' HORSE-POWER.

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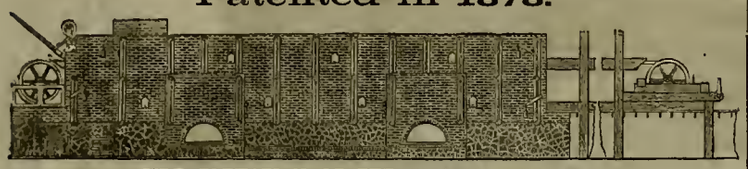

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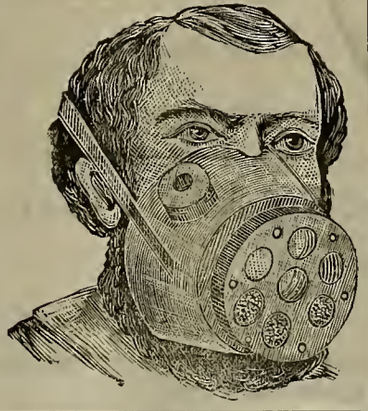

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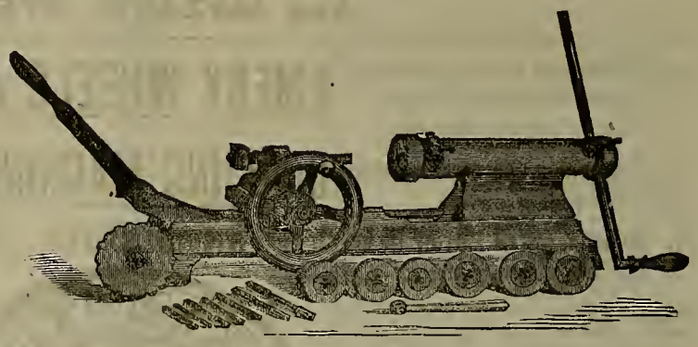

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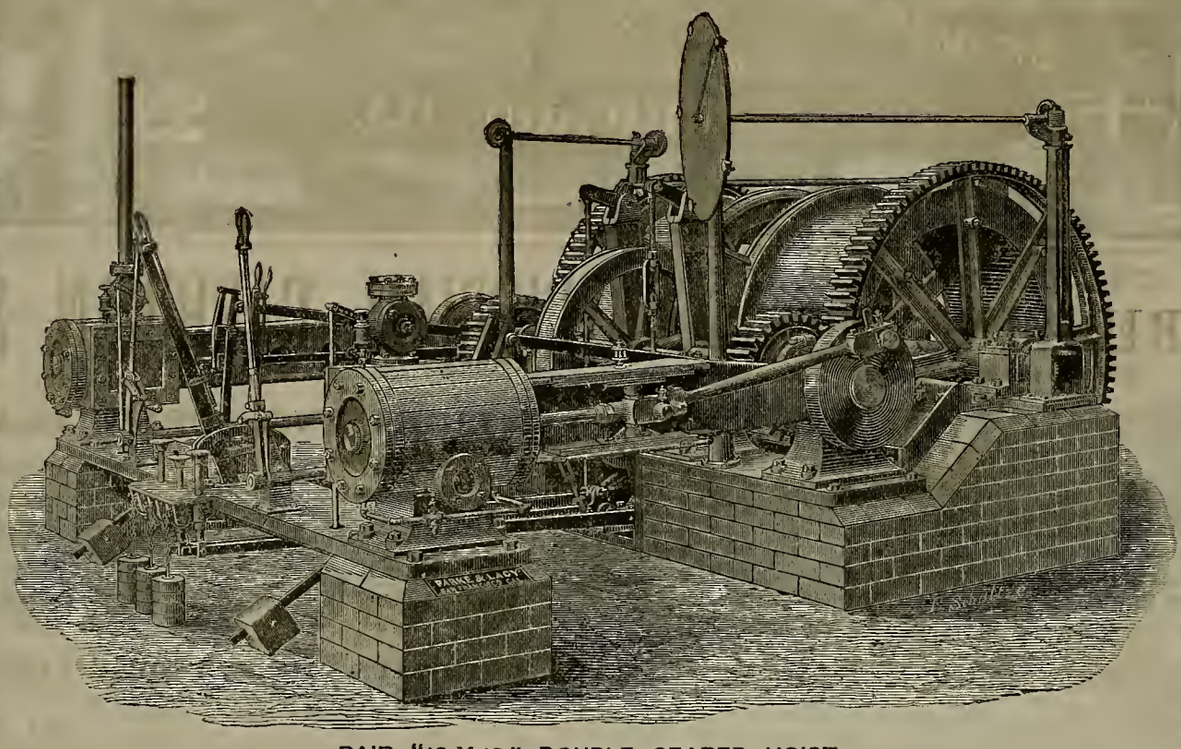

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Duly acknowledged, June, 4th, A. D. 1881, before San'l S. Murfey, Notary Public.
Endorsed—Filed May 8, 1881.
WILLIAM A. STUART, County Clerk.
By JOHN H. MOTT, Deputy Clerk.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 23, 1881.

VOLUME XLIII Number 4.

Foundry Notes.

Large Pumping Engines.

At a recent visit to the machine works of Messrs. Goss & Adams, 114 and 116 Beale St., we witnessed the starting up and trial of one of a pair of enormous direct acting plunger pumps, built by this firm, (and of which they make a specialty), for the new California Sugar Refinery, now being erected by Messrs. Spreckels on the Potrero. The pattern was devised by Mr. Geo. E. Dow, constructing engineer of the firm, who has secured through the MINING AND SCIENTIFIC PRESS Patent Agency several patents upon this pump, so it is purely a home production. The pair of pumps weigh 50 tons, a statement which will give an idea of their great size, and they are among the largest ever constructed in this city. They stand each 17 ft. 6 inches high, and 26 ft. 6 inches long.

The dimensions are as follows: Diameter of steam cylinders, 30 inches; diameter of plungers, 26 inches; length of stroke, 36 inches. The combined capacity of the pumps is 8,000 gallons a minute at a hight of 100 ft., or nearly 500,000 gallons per hour. They are intended to be used for cooling and condensing purposes at the sugar refinery, pumping salt water from the bay. The pair of pumps is set on a very solid foundation in the basement of the building, their suction pipes leading to a reservoir or well connected by a bricked tunnel with the bay. The flow of water is controlled by suitable valves or gates, arranged so that they can be easily lifted at any time, even with a heavy pressure on one side. A very complete series of screens for preventing the entrance of fish, dirt, etc., has been arranged by Mr. Watson, the superintendent of construction at the refinery, who, also devised the form of gate controlling the flow of water.

Aside from the direct improvements introduced on these pumps by Mr. Dow, the general design shows a proper consideration of proportion and detail, simplicity and accessibility to all working parts being prominent.

The engines are operated with Dow's latest improved valve motion, which controls the motion of the piston completely, being perfectly free from the concussive action, and controlling the length of stroke to a nicety. The performance of the pumps under the variable test to which they are subjected reflects credit on both builder and designer, and was perfectly satisfactory to the purchaser.

The pumps are mounted on substantial bed plates, which also serve as receiving chambers for the water, to which are connected 24-inch mains. The plungers are jointly connected to a central crosshead, and extend into chambers through external packing glands, separated sufficiently to receive slide frames, upon which rests the crosshead sustaining the plungers. As the weight of the plungers is relieved from the sleeves and packing and carried upon independent adjustable bearings (without interfering with the elements of flotation), the friction is materially reduced, as the packing space can be maintained perfectly concentric. We shall shortly present engravings showing the details of construction of this new form of pumps.

Golden State and Miners' Iron Works.

At these works they are very busy early and late on a large amount of small work for the country. Have just finished a new clam-shell dredging apparatus, which has been put at work in Oakland creek, removing the mud to the cars on the wharf from the scows into which it has been put by another machine. A similar machine is being made for work up at Humboldt bay. A great deal of work is being done for narrow gauge cars, such as boxes, storehouses, oil cups, and all the iron work, except axles and wheels. This work is being done for Carter Bros., at Newark, who are exceedingly busy on this class of work, building narrow gauge cars as fast as it is possible to be done. They have built and are building a lot for Mexico. These are shipped to Guaymas, where they are set up.

The works are doing a good deal of white iron work for Idaho quartz mills. They are also doing considerable for the Presidio Railway Co. in this city, among other things making 24-ft. pulleys for the cable. They have a lathe there, arranged so they can turn off 30-ft. pulleys. The Golden State and Miners' usually do most of the quicksilver mining work, but there is very little being done in that line now. They are making suction blowers for the Great Western mine, but that is about all.

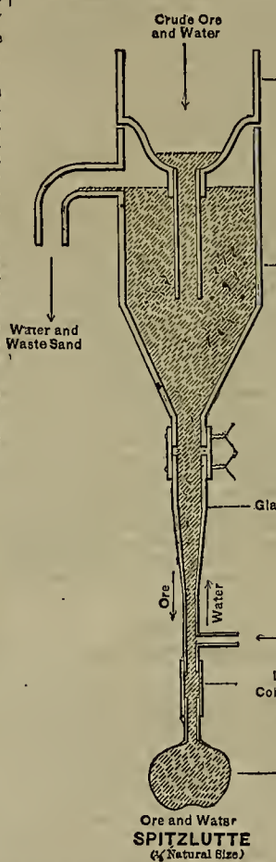
Notes on the Assay Spitzlutte.

Robt. H. Richards, S. B., Professor of Mining, read recently, before the American Institute of Mining Engineers, a description of an assay spitzlutte from the mining laboratory of the Massachusetts Institute of Technology. Prof. Richards says:

The spitzlutte, as described by Rittinger, is an instrument by which sand is sorted in a continual upward-flowing stream of water. Its usual form is that of a pointed box, placed with the point downward, the box receiving its feed of sand and water on one side, and discharging its tailings on the other. The assorted product or concentration is discharged at the bottom, at the apex of the box, through which it falls against an upward current of water, which current serves to effect the assorting and separation. To make this exposure to the quicksand condition still more effective, an inverted dam is placed across the spitzlutte, which forces the sand in its passage from the feed side to the discharge, to pass down into the more active portion of the upward-flowing current of water.

In the form adopted for small tests in the mining laboratory of the Massachusetts Institute of Technology (see accompanying sketch) the feed is through a central funnel instead of being at the side, and the apex of this funnel, extending down nearly to the apex of the cone, takes the place of the inverted dam in the large spitzlutte. To keep the experiment perfectly under control a bulb or bottle is attached by a rubber connecting-tube to receive the concentrations, and between this bottle and the apex of the spitzlutte is placed a glass tube of conical form, with a side tube for the admission of water. By regulating the admission of water through this tube the concentration may be allowed to go down into the bulb as fast or as slowly as the richness of the ore seems to demand.

JIG WITH GLASS SIDES
(½ Natural Size)



SPITZLUTTE
(½ Natural Size)

AN ASSAY SPITZLUTTE FOR MINING LABORATORIES.

This spitzlutte may be used on products that have been previously sized to take out the heavy mineral. As an example of this, a test was made upon a sample of ore where the galena, blende, and quartz were much mixed up, but separated perfectly when crushed. The sample of ore was from Newhnryport, and assayed 16.50% lead. After sizing through a series of sieves the ore yielded concentrations and tailings to the spitzlutte as follows:

Through. On.	Concentrations, Lead.	Middlings, Lead.	Tailings, Lead.
12 — 20	47.28%	11.38%	2.48%
20 — 30	47.81%		1.67%
30 — 40	48 61%		2.56%
40 — 50	51 93%		3.54%
50 — 90	50.95%		1.18%
90 —	31.93%		Not worked

Again this spitzlutte can be used on natural products. By these I mean products that have been crushed simply without being subjected to the usual process of sizing by a series of sieves. In this case its overflow sand must be re-treated by the miner's pan or sichertrog to extract the finer portion of the ore. It makes a very good preliminary to the miner's pan, taking out the largest grains, which interfere with the pan's best action, leaving the finer grains of ore for the pan to finish.

The spitzlutte has been used by us mainly to separate mercury and amalgam from pulp after amalgamating tests. For this purpose it is very efficient. It is also used to gain an approximate idea of how an ore will concentrate, and how fine it should be crushed in order to concentrate it to the best advantage on the large scale.

The little jig (shown in the accompanying sketch) used as a lecture experiment and as a test of larger machines, is 6 inches deep, 4 inches long and 3 inches wide, with plate glass sides, wooden ends, and a sieve bottom of 30 meshes to the inch.

This jig will show very perfect lines of separation between quartz, specific gravity 2.6, blende, specific gravity 4, and galena, specific gravity 7.5. It will show a partial separation between blende, specific gravity 4, and magnetite, specific gravity 5.1.

The separation of red marble, white barite and blue galena is very marked, and makes a good lecture experiment.

In using this jig to test the running of larger machines it simply shows with what ease or difficulty a given set of layers may be obtained.

In the vicinity of Milford and Beaver, the people are full of talk about the proposed southward extension of the Consolidated Utah Central railroad. According to the rumors there, the plan is to extend the Utah road to a connection with the Southern Pacific at some point in Arizona nearest the Utah line.

Academy of Sciences.

The regular monthly meeting of the Academy of Sciences was held last Monday evening, Pres. Davidson in the chair. John Richards, of the S. F. Tool Co., a mechanical engineer, was elected a member, and the applications for membership of David Cohn, Captain Charles Nelson and F. M. Whitlaw were referred to the Committee on Membership. Contributions to the museum were received as follows: From John A. Palmer, of Carlin, Nev., arrow-heads of Shoshone Indians, and a plant used by them for food; from Jerome Gay, a broken spear-head from Strawberry valley, Mt. Shasta; from Mrs. F. M. Pixley, an arrow-head found in a mound near San Rafael; from James Say, of Nevada, three arrow-points and two spear-heads of the Pahute Indians; E. R. Shimmin, a hanging nest of a titmouse; from H. M. Newhall, a skeleton of a cat; from R. W. Simpson, a piece of rock found on the north bank of the Columbia river; from Prof. Davidson, 23 photographs of natives of Easter island; from Josiah Kemp, A. M., curator of conchology, common sea shells of California; from H. C. Russell, Government Astronomer of New South Wales, results of observations made at the Sydney Observatory during 1877 and 1878; from Lieut. Frederick Schwatka, U. S. N., paper on ice navigation read before the United States Naval Institute.

From J. G. Crocker, Bakersfield, a rock crystal, petrified knot of wood, petrified peach, and petrified brain taken from the skull of a bullock; from Mrs. J. G. Lemmon, small piece of coal found at a depth of 80 ft. in an old tunnel, at the month of which is an oak tree 1½ ft. in diameter, petrified balsam from a dead fir tree in the Sierra Nevada mountains, virgin copper from a mine in Santa Rita mountains, Arizona, and silver ore from Davis mine, Patagonia mountains; from Dr. W. H. Harkness, magnesite carbonate of magnesia; from A. Weekes, fossil wood, lava and serpentine from Giant Gap gravel mine; from J. W. Wilder, a piece of black shale found in an artesian well near the Presidio, 70 ft. from the surface; from Jerome Fay, of Siskiyou county, a volcanic glass, and from James Say a quartz crystal and moss agate.

Judge Abram Fornander, of Honolulu, presented the second volume of his recent work on the Philology and Anthropology of the Pacific islands.

Dr. C. C. Parry, of the United States Bureau of Forestry, read a paper comparing plants found on Cerros island, on the coast of Lower California, with different varieties of California plants.

Prof. Davidson made some remarks concerning the comet, which we give more at length in another column.

Notice was given that at the next meeting Mr. John Richards will read a paper on "The application of standard measures to industrial pursuits."

AMONG the gifts to the library at the last meeting of the Academy of Sciences, was a large geological map in sheets of New South Wales, by the Government Geologist, in colors similar to maps published by the United States Survey of the 40th parallel. Accompanying this was a statement of the quantity and value of minerals raised in New South Wales prior to January 1st, 1880, with approximate areas of the mineral deposits and the formations in which they occur. These being of great general interest to California, the values of the following varieties of minerals included in the above enumeration are here given: Gold, £33,335,800; silver, £143,501; coal, £11,036,722; shale, petroleum oil and cannel coal, £495,574; tin, £3,144,237; copper, £2,494,437; iron, £54,151; antimony, £10,178; lead, £2,510. Total mineral product of New South Wales up to January 1, 1880, amounted to the gross sum of £50,717,110.

THE assay value of the output of the Ontario mine, Utah, for June, was $235,141, making the total gross yield of the mine to date, $8,486,653. The 68 consecutive dividend (65 of them $50,000, and three of $75,000 each) was paid June 15th.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Amador County Mines.

EDITORS PRESS:—Since my last lsttsr I have resnmed my tramp. Arriving at the Bunker Hill mill, I found quite an extensive change had taken nlace since my last visit. The mill has heen enlarged and improvsd hsyond recognitiou to an old ssttler—in fact, it is a new mill with the exception of 10 stamps and a few Hendy concsntrators, which constituted the old one. The present mill in its finished condition has one rock-hreaker (self-feeders), 40 stamps, a numhsr of Hendy concentrators, and eight Frue tahles of the latest pattern. I am informed that the lattsr concentrator does excellent work with proper care. The pulp from the Hendy concentors is delivered to a conceutrator patented hy Dr. Blatchley from San Francisco, which appears to he simple of construction and dnrahle. If its merits are as good as represented, it will supersede all other concentrators in view of its advantages of first cost and after repaire when in nse. I find a numher of water-wheels lying around the premises. It seems to me it mnst have heen quite a honanza to a foundry to cast so many one after another. And finally, I am told, after experimenting with quite a number of pressure wheele of different patterns with no satisfactory results, the management on the score of economy were ohliged to put one in of home production, choosing Knight's patent, which gives the hest resnlts so far. From the mill I visited the

New Chlorination Works,

Worked under the Mears patent, a revolving furnace for roasting. And hy the hy, I am told this mechanical fornace is not a succcss for roasting gold sulphurets. As a matter of fact, in this establishment, they were compelled to roaet their first batch of 100 tons or so over a second time. At first grand resnlte were promised; so far it is quite the reverse. I fail to see any improvement over the usual method of working eulphurets heretofore in use in thie county, and onr quartz mine owners look with a great deal of suspicion npon the innovations.

At the north shaft I find a new hut very frail gallows frame, and a small double hoist. Present depth of shaft, about 400 ft.; eouth shaft, no improvements to date—the same old hoisting rig. It seems to me if the mine ie ae good as represented, why not put up good and suhstantial hoisting works? It has heen the universal custom heretofore in this county to do all improvements on the surface for the time heing only, uot thinking how often renewal bas to take place on account of increased depth and the improvements in crushing of mills.

Well, grand results are expected from this property. Its present owners are confident of its future succees. I trust they will he fully rewarded for the vast amount of money expended within the last 12 months. Adjoining the Bunker Hill comes the

Original Amador.

Now lying idle after draining its stockholders in England without limit. Indeed, it eeems to me that English capital always goes amiss in our county. Thie property was disposed of hy misrepresentation for an enormous sum. Since the purchase a very large snm of money has been expended in exploring the mine with hopes of regaining some small mite of the capital invested, hut so far with no satisfactory results; in fact I hear the mine is shut down for good, and some of the mill machinery is heing removed. A company that has expendcd eo much money, and that very liberally, deservee better. The next mine of importance is the

Famous Keystone,

One of the most profitable properties in this State, without any exception. The very looks around thie mine bear an air of prosperity. Mill has hcen lately rehuilt under the enperintendency of that master of mechanics, Mr. Lepley, who, hy the hy, ie an inventive genius of great merit. In fact, his handiwork is to he seen on every hand around the mine and mill. Such a man ie of incalculahle value to such a company as this. Mill has 40 etamps, self-feeders, rock hreaker, an ore hin that will hold 3,000 tons in reserve in case of accident in mine. Hendy concentratore giving satisfactory results. Save some 45 to 50 tons of sulphurets per mouth, worked at the Amador reduction works of Sutter Creek. Sulphurets yield ahout $130 to $150 per ton ot 2,000 lbs. Ore averages from $10 to $15 per ton, occasionally going higher. This company contemplates some extensive improvements this season—a new fire-proof office, one of the hest hoisting works in the State, also a sulphuret reduction works. Bricks have heen manufactured for this purpose, and I believe work will he soon started.

Next to the Keystone comes the South Spring Hill Quartz mine, a..nply prospecting with encouraging prospects; and farther south is a mine which was at one time famons for rich rock, hut for eome time has heen idlo, with no proepect of starting up soon.

The Comet Mine

Has reverted to its former owner. Depth of shaft, 180 ft. Prospects, discouraging. Adjoining this claim R. C. Downs has just started to prospect. It is a piece of mining property recsntly hought, having heen idls for a numher of years. From surface indications, and also the history of the north and south extsnsions it is not a very desirahle property to have at the present time. However, it will reqnire some depth to prove its valne. Lincoln mine has been idle since the lsase expired. It has not hesn worked hy the company proper for the last four years; present depth of mine, 800 ft. Outside appsarancss are very disconraging for it sver resuming work. Top of shaft and hoisting works settling out of shape; gallows frame ready to fall down, and a few caves here and there show clearly that the foreign stockholders have had enough of this pie. It is only one more instance of how they were deceived. I helieve the foreign stockholders in this mine ars Scotch.

The Mahoney

Has just started its new pump, which does not, so far, give entire satisfaction. The intention is to go down to the 800-ft. levsl. Present appearance of surface seems to me as if the mine had heen hadly managed, settling and caving in all directions. This company have had their legal difficulties for eome time and the end is not yet. It is whispered around that the present management are trying to make a sale. In fact all goes to prove it. The mine to-day does not pay its present expenses, nor has it for some years. A good chance for a *foreign investment*.

Wildeman Mine

Has heen idle for some time. At present it has a lawsnit to contend with, tbat most likely will keep it in snspenee for some time longer.

The Cou. Amador is sinking; present depth of shaft about 800 ft. The last fire has put a damper on the futnre prospect of this property. It ie the intention of the present stockholders to sink the shaft to a depth, of 1,000 ft. If not satisfactory at that depth will suspend for an indefinite length of time.

Oneida mine has taken down everything. It is evidently shut down for good after an expenditnre of eome hundreds of tbonsande of dollars hy different parties, and a very great deal has heen expended very foolishly.

You will observe some of our representative mines are not looking very well and eome ahandoned for good; etill there is a fair prospect of some other properties taking their place in the near future.

Cooney mine, situated one mile eouth of Jackson, is running in full blast. It has one of the finest and most expensive mills in the State—40 stamps, rock hreaker, etc.—but for some reason it does not do the work. Sixteen Frue concentrators eave some 2½ to 3 tons per day of snlphurets that work up to from $90 to $100 per ton. The company have one of the fineet reduction works in the county. No expense epared on any improvements around thie mine. It is well that Dr. Zeile has a long purse.

I will give you more particnlars in a future letter ahout this property and others. I have endeavored to give yon the truth without any coloring, ae I am one of a great many who believe that these rose-colored reports are of more harm than good to any mining district. A mine that will not hear close inspection is not worth having.

QUARTZ MINER.

Sutter Creek, July, 1881.

Expenditures on Claims.

The following circular has jnst heen promulgated hy the Commissioner of tbe General Land Office, explaining and interpreting the act to amend sections 2,324 and 2,325 of the Revised Statutes of the United Statee, concerning mineral lands, approved Jannary 22, 1880:

The first section of this act has reference only to the affidavits mentioned in section 2,325 of the Revised Statutes. It is therefore held that it has no reference to the manner of estahlishing proof of citizenship. An applicant for a mining patent who resides in the land district in which the mine is located, if within the district at the time the application is made, must take the required affidavits. If he is not so within the district, the affidavits may be made by a duly appointed agent conversant with the facts.

It is held, under the eecond section of the act, that lahor performed or money expended upon a mining claim prior to the 1st day of January eucceeding the date of location thereof, will not be considered as a partof, or applied upon, the first annual expeuditure required hy law. Thus, upon a claim located at any time during the year 1880, the period within which the labor must he performed commences January 1, 1881, and during the calendar year 1881 the expenditure must bs made, or the claim will he subject to re-location on and after Jannary 1, 1882.

In order to apply the law to a claim located prior to the year 1880, it will he necessary to calculate from the date of locatiou. For instance, a claim located in 1875, the first expeditnre would he reckoned as due within the year from January 1, 1876, to wit: January 1, 1877, and annually thereafter by the calendar year.

WORK ON MILLING OR MINING LANDS.—The department decides that no specific amount of annual expenditnree is required npon lands located in good faith for milling or mining purpoes. The performance of the amount of lahor of the required value upon a lode claim is eufficient for the purpose of retaining possessory right to a mill-site located in counection with the claim.

Notes on Irrigation.—No. 2.

I will as briefly as possihle call your attention to the Mokelumne valley and the adjacent country lying betwesn Dry creek on the north and Mormon slough on the south (an area of 150,000 acres), so far as one system of drainage and irrigation can be applied. The Mokelumns river takes its rise in the high Sierras to the east of ns, where is stored the annual prodnct of snow and ice, to be melted by the sun of summer and sent down in perennial streams througb precipitous and rocky canons of wildest graudenr to the thirsty plains hslow.

The elevation of the Mokelnmne at Hermit valley as stated by Prof. Whitney, State Geologist, is 7,259 ft. ahove sea level. The snow is said to accumulate there in the winter to great depths, owing to its great slevation and sheltered position, with high mountains on all sides.

Like most of our large mountain streams, it flows in a deeply eroded channsl, and where it dehonches from the foothills, lies in a trough 50 or 30 ft. below the level of the plain, until at Woodhridge, in flood-time, much of the stream overflows its hanks and spreads through varions drainage channels over the plains. Below Woodhridge the river takes a northwestern sweep of 35 miles (or 15 miles in a direct line when it divides, making the north and south fork, and emhracing in its sinuous folds Staten island, a body of swamp and overflowed land, with an area of 10,000 acres). The river again rennites and runs four milee, when it finally debouches into the San Joaquin. At the head of tide water navigation, near Mokelumne City, or near New Hope, the waters of the Cosumnes and Dry Creek nnite with the Mokelumne. The cachement or drainage area of these three streams combined, amounts to 1,372 miles—that of the Mokelumne alone heing 573 square miles.

The mean discharge of the Mokelumne in average seasons, during the months of May, June and July is, approximately, 4,500 cubic ft. per second—sufficient to irrigate 225,000 acres under a duty of 50 acres per cubic ft. per second; or 450,000 acres under a duty of 100 acres per cubic ft. per second; or 675,000 acres under a duty of 150 acres per cubic ft. per second; or 1,350,000 acres under a duty of 300 acree per cubic ft. per second, as Prof. Davidson thinks might he reached, considering our soil as applied to cereals. You will see, therefore, that if we wish to go into the irrigation business on a grand scale, and spread ourselves, we have abnndant resonrces of one of the most important essentiale, so far as water snpply is concerned. (Prohahly the water that ran to waste last season reached ten times the amount above indicated.)

Duty of Water.

I have just used the term "duty" per cubic ft. of water. By this we mean the qnantity reqnired to irrigats a superficial area of land of standard dimensions; as, for instance, an acre; or hy the statement of an area of land effectually irrigated by the use of a definite volume of water, delivered at a uniform rate through a certain period of time—the irrigating season. Thue, in the case of a etream which delivers water at the rate of five cnbic ft. per second through the season, and accomplishes the irrigation of 500 acree of land, we say that the water performs a duty of 100 acree per second ft., meaning that each ft. per second, continuously flowing through the esason, irrigatee 100 acres of land. This expression is, of course, in terms of the extent in acreage, performed hy a etandard volume of water—the cuhic ft. per second of continnous flow for the season. (Halls.)

Bnt the quantity of water required may he variahle, according to the character of the soil and the crops to he cultivated; cereals requiring the least, and hoed crope the most. Although the Calaveras river has a cachement area of 390 square miles, it doee not head high enough in the monntains to he perennial in its flow.

The forke of the Mokelumne and Stanislans on either eide lap around and ahove tho Calaveras, whose main supply is the raine of winter. It has, therefore, little value as a stream for irrigation. The Mormon slough fork bas heen utilized for that purpose, I helieve, to a limited extent.

I have referred to the Mokelumne as a stream having ahnndant aqueous supplies if properly distrihuted, for all the irrigahle lande in San Joaquin county, with a large surplus for eeveral other total ahstinence communities.

But from the topography of the country hefore referred to, it cannot he taken out as cheaply as the waters of some other rivers, and we are ohliged to go up into the foothills and hring it along the hillsides until we can place it upon the crust of the plain at a satisfactory elevation for transmission to the desired points. To reach all the lands snsceptihle of being irrigated from this source, the water should he taken out as high up as the site of the old Wade & Arson hridge, jnst northwest of Campo Seco, thence to be transmittsd in a canal the distance of eight miles to Bear creek; one hranch thence to the crest of the plaine to reach a drainage channel, Paddy's creek, I helieve, where it will intersect the Calaveras at or near Bellota. This hranch will irrigate the county east of Stockton.

To construct this main supply channel of 8 miles there are no engineering difficulties to be encountered, no expeneive rock cnts of moment; hut 2 or 3 gulches to epan by aqueducts or cross by pipes, and tbe soil generally, at the propsr season, is easily worked. In tbe case of the Mokelumne Ditch and Irrigation Co., it was estimatsd that a section of canal of this length, sufficient to irrigate 50,000 acrss, could he constructed for $20,000, sxclusive of dam and headworks. Reaching Bear cresk, we ntilize that channel as a main trunk for the snpply of suhordinate ditches that will place water upon all the lands lying hetwsen the Mokclumne and Calaveras.

New Use for Miner's Ditches.

And here I wish to remark that the era of gold mining has left its rich heritage of mining ditches that cost the hnildsrs hundreds of thousands of dollars, and having to a great extent served their purpose, may now he utilizsd for agricultural purposes for a small per cent. of their original cost. Of this character is the Davis ditch that cost $130,000, that takes its water from Italian bar, nortb of Campo Seco, and transmitted it along ths slopes snd crests of hills to Lancha Plana, Wintsrs' bar, Poverty har and Mike's gulch, soutbeast of the Poland houss.

This ditch has a capacity for irrigating about 30,000 acres, and at any time in the futnre may he enlarged to any required size. The lower portion—that west of Comanche is not now in use, hut I am told may he restored for ahont $1,000 and water put into Bear creek within one month. The entire ditch now in good working order, with the reservoirs, pipes and appurtances cau he purchased for $20,000. An outlay of $5,000 or $6,000 will douhle its capacity.

Bear creek is the main drainage channel for the section of country lying hetween the Mokelumne and Calaveras rivers. Ite length from where it forms a junction with the proposed canal is ahout 20 miles, and terminates in Fourteen-mile slough, a tidal afluent of the San Joaquin river.

It is proposed to utilize this as the main eupply trunk. Where it intersecte the canal the width is 35 ft., hut soon increases in size ae it receives the drainage of numerous afluents which make their way from the plains, until in the lowlands, the embankments made to confine the waters from spreading over the country in the rainy season, are 100 to 150 ft apart. The higbt of the banks is from four to six ft.

For the first two miles the fall is 11.1 ft. per mile, then averages seven to five ft. per mile. The total fall is 170 ft., or an average of about nine ft. per mile. With thie excessive fall, giving a current from six to four miles per hour, the stahilty of the channel would be greatly endangered were it not from the fact that the underlying strata along the upper part of the liues ie of lava rock, or sandstone, merging on the plains into indurated sand or hardpan, of sufficient compactness to resist the ordinary erosion of water. Bear creek forks at a point half a mile soutb of the Poland house, and this hranch may he continned along the south side of the Lockeford road, thence westerly following the crest of the Mokelumne, on the township line down past Woodhridge to the head of Sycamore slough on land of Sargent Bros.

Another fork occurs near Harmony Grove school-house, and at Brannock's old place on the Cherokee lane road, takes the name of Brannock's slongb. This finally spreads upon the plains, hut the lower end is now emhanked, however, so as to confine ite waters, and they fall into White's slough in the S. & O. lande.

Between the Calaveras and the Mokelumne.

You will ece, therefore, that in a system of irrigation worke for this section Bear creek will occupy a very important position, as it will serve as a supply canal for most of the plain lands hetween the Mokelumne and Calaveras.

Snh-ditchee can he taken thence hy tbe farmer to he applied to his lands, the topographic slope heing such that water will reach all parts of it.

A hranch canal could be taken out of Bear creek jnst east of Lockeford and carried south so as to intersect Thomas slough, which it would partly follow, and be dropped into the Calaveras Irrigation Co.'s canal, near Tone's hridge and thence carried 14 miles, where it intersects Bear creek near the Five-mile honse, lower Sacramento road. There are numeroue other drainage channels in the dietrict which may he utilized to transmit water, or for the purpose of drainage.

The area that may he reached by the system of irrigation ahove outlined, embracee about 150,000 acres. Of this amonnt 95,500 acres lie hetween the Mokelumne and Calaveras. What portion of this area is likely to he irrigated at any one time is a question. Referring to the irrigation districts of Europe, we find that ahout one-half the numher of acres within a district, received the direct application of water. In India, one-third. Allowance must he made for roads, towns, and building sites, woodlands, pastures and lands lying fallow.

SQUAW CREEK.—From Mr. J. R. Murphy, who was in Challis a few days ago, we learn that the great ore chimney in the Saturday mine, continues down as depth is obtained in the workings. He does not claim that the ore is of high grade; hut upon a calculation of cost of reduction, in comparison with that at Eureka, he claims that they can he worked with as great profit as at that place. In the handling of smelting ores, charcoal is an important item; and this commodity costs an average of 30 cents per hushel at Eureka, while iu onr camp it can he delivered for a trifle over balf that price.—*Challis Messenger.*

MECHANICAL PROGRESS.

Pickling Castings.

The action of acids on castings just from the mold is not always understood, and when haste is required in preparing castings for manipulation time is wasted unnecessarily. The acids attack the metal—iron, brass or bronze—and not the envelope of burned sand or the skin of oxide. The acids get under these and lift them from the metallic surface by a chemical process similar to that we understand as fomentation, a combination of the acids with the oxygen of the atmosphere and the oxygen of the metals. By rapid fomentation the scale and sand are loosened and easily removed by washing and the use of wire brushes. The silicate of the sand is melted by the intense heat of the fused metal and forms a solid coat under the loosely adhering sand of the mold, and under that is the pyrogenous oxide of the metal itself, neither of which are readily attacked by the acid.

The acid attacks only the metal, and this should be exposed to its action in order to facilitate the cleansing process. A few blows with the penn of a hammer at short distances apart disintegrates the enveloping crust and allows the acid to enter to the surface of the metal. Once in, it works its way under the scale and loosens all the foreign matter from the metal.

The usual course of merely jarring off the loose sand by a rap on the casting as raised from the mold, does not give sufficient ingress to the acid and the air; the better way is to have a man give a few sharp raps with a hammer pean along the face of the casting or by an instrument composed of three steel plates hardened, set on a square shank, and held by a nut, the shank terminating in a handle. Such an instrument will keep its edges sufficiently sharp until worn up to near the handle, and is very effectual in breaking through the molding sand and the brittle oxide and allowing the acid to act rapidly. Blows from three to six inches apart are sufficient for the purpose of hastening the action of the acid. Castings so treated can be pickled in a few minutes, or an hour at most, and will come out so free that a slight brushing with the wire brush and rinsing in water will leave them ready for the lathe, planer or vise.—*Boston Journal of Commerce.*

WET PEAT FOR STEAM-FUEL.—A correspondent of the Boston *Journal of Commerce* writes as follows: "Having had two years' experience with the Jarvis furnace setting I would say, as far as my experience has gone, I find it second to none; having used peat not more than two hours from its bed, saturated with water. The first time I really thought it impossible to burn, but I was soon convinced the other way. I found, after mixing one part of coal to three of peat, that one firing of the mixture lasted longer than an all-coal fire did. I also found that after the fire got well under way I got a far better result, for with an all-coal fire my water would remain still; in my compound, with a peat fire, I could fluctuate my water two inches in the glass. The result was astonishing to me as well as others. To overcome an addition of labor on my fireman, I had the peat brought into the boiler-house alongside the coal, so that the fireman, instead of mixing in the usual way, would shovel one of coal and three of peat. Furthermore, I would say we had a large sawmill in the yard, also a planing mill and box shop, which gave a large percentage of fuel in the line of sawdust, shavings and small blocks; the sawdust had been used for barn purposes, also for ice-house, and the remainder for filling in the lumber yard. I commenced to use up this after my boilers were set up with the Jarvis furnace. I was informed by some of the old settlers that some of the sawdust I was using had been there from 10 to 12 years, for I found it black with age. If some of the users of steam would give peat one trial, I would venture to say they would continue its use, providing they are not overcharged for it. I would guarantee them a good result and a cheap fuel."

HOLDING POWER OF STEAM TUBES.—In order to settle the question what is the holding power of tubes in steam boilers rolled by the Dudgeon tube expander, now so generally used by boiler makers, the Hartford Steam Boiler Inspection and Insurance Co. had a test made by Mr. C. B. Richards. H. B. Beach & Son, of Hartford, prepared three specimens composed of tubes three inches external diameter, rolled into ⅝ inch plate in the ordinary way, without any expanding other than that produced by the apparatus, without the projecting part being flared or beaded. It was, therefore, held by friction only. The tube end, where it passed through the plate, was increased in diameter by 0.1 inch by the expanding process. In two samples in which the plate was 15 32 of an inch thick the tube yielded at 4,500 and 7,000 lbs., while a third, in a ½-inch plate, yielded at a stress of 6,000 lbs.

STEEL BELTING.—A patent recently granted in Vienna and Berlin uses bands of steel, tempered and hardened, to transmit motion from one pulley to the other, the faces of the pulleys being turned perfectly flat and then faced with a varnish of rosin, shellac and asphalt. The fastenings of these belts are of a peculiar structure and cannot properly be described without engravings.

Artificial Seasoning of Timber.

A German piano manufacturer, Herr C. Rene, of Stettin, claims that the experience of a number of years has shown the superiority of a method of seasoning timber artificially, introduced by him. In his plan he makes use of the property of oxygen, particularly of that ozonized by the electric current, to artificially season the timber. The first impulse to experiments being carried out in this direction, was given by the well-known fact that wood which has been seasoned for years is much more suitable for the manufacture of musical instruments than if used soon after it is thoroughly dried only. Mr. Rene claims that instruments made of wood which has been treated by his oxygen process possess a remarkably fine tone, which not only does not decrease with age, but, so far as experience teaches, improves with age as does the tone of some famous old violins by Italian masters. We are further told that the sounding boards made of wood prepared in this manner have the quality of retaining the sound longer and more powerfully. A number of pianos manufactured at Mr. Rene's works and exported to the tropics several years ago, have stood exceedingly well, and seem in no way affected by the climatic dangers they are exposed to. While other methods of impregnating wood with chemicals generally have a deteriorating influence on the wood fibers, timber prepared by this method, which is really an artificial ageing, becomes harder and stronger. The process and the apparatus consists of a hermetically closed boiler or tank, in which the wood to be treated by the process is placed on iron gratings; in a retort placed by the side of the boiler and connected to it by a pipe with stop valve, oxygen is developed and admitted into the boiler through the valve. Provision is made in the boiler to ozonize the oxygen by means of an electric current, and the boiler is then gently fired and kept hot for 48 or 50 hours, after which time the process of preservation of wood is complete.

MALLEABLE CASTINGS. — Considerable pretense of mystery is assumed by manufacturers of malleable castings, both in this and the old country, and doubtless there are some trade secrets of value to those in the trade relative to mixtures of different irons, etc., but the process is in itself simple, and a little experience should enable any foundryman to attain a creditable success in it. The London *Ironmonger* says: "For the purpose of the casting, pig of a fine quality is needed, and great care is used in the preparation of the moulds, so that there may be no flaw or imperfection in the casting. The latter, after cooling, is, of course, hard and brittle, and it is to remove this brittleness and give it the character of malleable iron that the special process is required. The casting is now placed in hermetically sealed pots or boxes, surrounded by powdered ore, and subjected for several days to intense heat, which by cementation, gradually softens it and renders it malleable to the core, when it may be bent or wound into any shape."

NEW STEAM GENERATOR.—A French manufacturing firm, Messrs. Serpolet, have patented a peculiar method of generating steam. At each stroke of the piston of the engine a certain quantity of water is projected against two strongly heated metal plates. The steam so produced goes directly into the cylinder, so that in this arrangement not only a special generator, but also the valve system for the entering steam, is superfluous. In the example given in *Dingler's Journal* the vaporizing surface consists of two metallic cones, one within the other, with an interval of about 0.04 inch between. The hollow space is divided into two chambers, each of which is connected with one side of the cylinder. The gases play first on the inner surface of the double cone, then on the outer.

COMPARATIVE VALUE OF STEAM ENGINES.—Hallauer's recent experiments have led him to the conclusion that the difference between engines of one and two cylinders, in point of economy, is very slight. In ranging from 80 to 8,000 horse power, with revolutions varying from 25 to 90 per minute, the expenditure of steam for a given amount of work remains the same for the same type of motor; the consumptions for two cylinder motors are identical for Woolf and compound, whatever may be the volumes of the cylinders, provided the motors are regulated so as to give the maximum efficiency; the expenditures of steam in motors of one, two, and three cylinders, suitably regulated and constructed, are so nearly alike that the choice may be governed in each instance merely by the fitness of the type of the engine for the particular purpose desired.

AN improved furnace for locomotive and other steam boilers has been patented by John Alves, of Dunedin, New Zealand. The grate bars are set out from the tube sheet to leave an air passage between them, and a fire bridge is supported by the grate bars, and is provided with a vertical and inclined and horizontal slots and flange surmounting the air chamber.

HOW MADE.—Hollow steel shafting, which is gradually coming into use, is made by casting the metal round a core of lime, the ingot being finally rolled into shafting, the lime core going with it and diminishing in diameter in the same proportion as the metal, even when the total diameter is reduced as low as ¼ inch.

SCIENTIFIC PROGRESS.

Color Relations of Metals.

In a paper on the color relations of copper, nickel, cobalt, iron, manganese and chromium, read before the Chemical society, Mr. T. Bayley records some remarkable relations between solutions of these metals. It appears that iron, cobalt and copper form a natural color group, for if solutions of their sulphates are mixed together in the proportions of 20 parts of copper, eight of iron and six of cobalt, the resulting liquid is free from color, but is gray and partially opaque. It follows from this that a mixture of any two of these elements is complementary to the third, if the above proportions are maintained. Thus a solution of cobalt (pink) is complementary to a mixture of iron and copper (bluish green); a solution of iron (yellow) to a mixture of copper and cobalt (violet); and a solution of copper (blue) to a mixture of cobalt and iron (red). But, as Mr. Bayley shows, a solution of copper is exactly complementary to the red reflection from copper, and a polished plate of this metal viewed through a solution of copper salt of a certain thickness is silver-white. As a further consequence it follows that a mixture of iron (7 parts) and cobalt (6 parts) is identical in color with a plate of copper. The resemblance is so striking, that a silver or platinum vessel covered to a proper depth with such a solution, is indistinguishable from copper.

There is a curious fact regarding nickel, also worthy of attention. The metal forms solutions which can be exactly simulated by a mixture of iron and copper solutions; but this mixture contains more iron than that which is complementary to cobalt. Nickel solutions are almost complementary to cobalt solutions, but they transmit an excess of yellow light. Now the atomic weight of nickel is very nearly the mean of the atomic weight of iron and copper, but it is a little lower, that is, nearer to iron. There is thus a perfect analogy between the atomic weights and the color properties in this case. This analogy is even more general, for Mr. Bayley states that in the case of iron, cobalt and copper, the mean wave length of the light absorbed is proportional to the atomic weight. The specific chromatic power of the metal varies, being least for copper. The specific chromatic power increases with the affinity of the metal for oxygen. Chromium forms three kinds of salts—pink salts, identical in color with the cobalt salts; blue salts, identical in color with copper salts; and green salts, complementary to the red salts.

Manganese, in like manner, forms more than one kin of salt. The red salts of manganese are identical in color with the red cobalt salts and with the red chromium salts. The salts of chromium and manganese, according to the author, are with difficulty attainable in a state of chromatic purity. He thinks that these properties of the metals lead up to some very interesting considerations.—*Chemical Review.*

Rival Methods.

A good deal of attention is now given in New York to the different methods of producing the electric light. The *Times* says a serious objection to the use of the dynamic machine, used for the purpose of producing the light, is the fluctuation in the intensity of the blaze, due to causes which seem to be insurmountable. The use of steam power to generate electricity seems impossible from vibrations in the density of the light. But it is now claimed that by using batteries instead of dynamo-electric machines, a steady and non-varying light can be obtained. The claim which the *Times* speaks of seems pretty well established. The *Times* adds: "Batteries, or cells, as sources of power, ought to be less costly than the machines now in use, and their employment could be universally practicable where the machines would be beyond the reach of most people. If, in addition to the advantages of cheapness and availability, the electric light can be made perfectly steady in volume and luster, a great step will have been made toward securing a perfect artificial light.

PREHISTORIC FINDS.—While working the lead mines in the province of Segovia, some 70 miles west of Madrid, Spain, an immense cavern was found, containing, upon an argillaceous deposit and in the midst of stalagmites, 500 skeletons of men and women. Besides 10 well-shaped and perfect skulls of prehistoric type, there were chipped stone and quartz implements and fragments of rude pottery. In France, in the lower tertiary beds near Rheims—which were considered nearly, if not quite Azoic—Dr. Lemoine has discovered fossil remains of an extremely interesting fauna, comprising numerous new species, and even some new genera, of mammals, birds and reptiles. Many of these species exhibit characters intermediate between those of types which have been heretofore described.

A VIENNA chemist has succeeded in producing a new coloring matter on silk, which is a nice blue by day and a beautiful pink by artificial light. The alcoholic solution of this color is dark violet in a transparent, but red in direct light.

Inflammability by the Action of Nitric Acid.

It has long been a mooted question with scientists whether or not nitric acid is able to ignite vegetable matter. Instances have been known where such a result seems to have occurred; but most scientists have generally attributed the ignition to the presence of small quantities of some other substances than simply nitric acid and vegetable matter. A German chemist, named Kraut, some eight or 10 years since tried to prove that, by pouring nitric acid of 1.5, or fuming nitric acid of 1.62 specific gravity, on straw, sawdust or packing linen, the temperature could be raised to 55°, without causing the mixture to ignite, thus contradicting various statements that nitric acid was a dangerous article to ship. A similar statement was afterward made by the Naturalists' Convention, in Hamburg.

Quite recently, however, this same chemist has communicated to the Chemical Society at Berlin the fact that he has found out how to prove the inflammability of a mixture of nitric acid in connection with sawdust, straw, hay, cotton and shavings. He stated that he has made several trials of this fact, always with the same result. He about half fills a square wooden box with one of the above materials, puts a flask containing 25 to 100 cubic centimeters of nitric acid, of at least 1.5 specific gravity, upon it, and fills the box full of hay, straw, or the same material mentioned above; then, by some means, breaks the flask in the box, and puts a light cover over it. After one or two minutes, vapors are visible; some time after, a thick, white foam, resulting from the nitric acid, arises, which is followed by the smoke of the burning material. If the cover is taken off after five or ten minutes, the box is found to contain burning ocaly matter, which begins to flame up by contact with the air, and often also ignites the box itself. In other cases, the opening of the box was not necessary to cause the material to flame. With nitric acid of 1.45, Kraut did not succeed in bringing forth flames.

On the Substitution of Oleomagarine for Butter.

Professor Riche has read an article before the *Academie de Medecine* an official report of the commission appointed by the Minister of the Interior, to give an opinion as to the propriety of substituting oleomargarine for butter in the asylums for the insane, from which the following conclusions are drawn:

1st. It appears from three years' experience at St. Anne, at Vaucluse, and at Ville Evrard, that the employees and some patients could not endure this alteration in the usual fare.

2d. The alimentation, and therefore the preservation in health of extra sensitive and very delicate patients, would be unfavorably affected. In any case it would be a serious change in the regimen of those whose constitutions were already worn out.

3d. Oleomargarine is a manufactured product and so open to fraud; it is well known that vegetable oils are used. Moreover, experience shows that some time is required for a stomach accustomed to food cooked in fat to become habituated to that dressed in oil; and physiological researches prove that vegetable oils are less easily digested than animal fat.

4th. Fatty substances are only absorbed into the system in the state of emulsion. Chemical practice and culinary experience having shown that oleomargarine does not emulsionize so readily as butter, and that the emulsion of the former is not as stable as that of the latter, it is reasonable to conclude that oleomargarine is not so easily assimilated as butter.

It was therefore proposed that the commission should reply to the Minister that the *Academie* considered the proposed substitution inexpedient; and this proposition being put to vote, was unanimously approved.—*Moniteur de la Pharm.*

BLEACHING BY THE ELECTRIC LIGHT.—The proposition to stimulate the growth of plants at night by means of the electric light and thus insure their early maturity, was quite a surprise to the average agriculturist. And now M. Claude, a Frenchman, surprises the dyers by inventing and patenting an application of the same light to the bleaching of textiles and other substances. This he proposes to do by placing the light in a rectangular box, provided with a reflector, before which the yarn of cloth is moved slowly by means of rollers. He is indifferent as to whether the light is produced between points as in the Brush system, or by the incandescence of a thin band, as in that of Edison, but he seems to be unwilling to rely on it altogether. For he proposes to impregnate the fabric and the atmosphere of his bleaching chamber with the vapor of oil of turpentine, and he suggests the employment of the peroxide of hydrogen in order to complete the decoloriziug, an effect it would produce without the light.

PRESERVATION OF THE COLORS OF DRIED PLANTS.—According to M. Storbzl, the slow immersion of the fresh plant in a boiling solution of one part of salicylic acid in 600 parts of alcohol, and then shaking off superfluous moisture, previous to pressing in the usual way between blotting-paper, will more nearly preserve the natural color than any other method.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending June 30		Week Ending July 7.		Week Ending July 14		Week Ending July 21	
Alpha	3½	3	3.10	3	2.85	2½	3⅜	2½
Alta	4.40	4	4¼	3.90	4.15	3.55	4.20	3.85
Andes	2.20	1.85	1.90	1½	1.55	1½	1.55	1.30
Albion	4	3.70	3.95	3	3.85	3.45	4.05	3.10
Argenta	15c	10c	10c	....	10c	5c	10c	5c
Addenda	25c	15c	25c	....	15c	....	15c	10c
Belcher	3.40	3.20	3.35	2.65	3	2.65	3.15	2.70
Belmont	80c	....	....	....	....	....	....	....
Best & Belcher	13⅞	11½	11⅞	9½	10	8¼	10½	9
Bullion	1½	1¼	1.40	1	95c	75c	95c	60c
Bechtel	2¼	1.30	2	1.85	1.80	1.30	1.80	1½
Belle Isle	50c	10c	....	....	25c	....	....	....
Bodie	7	6¾	7¼	7	7¼	6¼	7	6¼
Benton	1.20	1.05	1.10	1	1	90c	1.05	75c
Bulwer	2½	....	2.60	....	2.60	2¼	3	2.80
Boston	....	....	....	....	50c	....	....	....
Black Hawk	20c	15c	15c	....	20c	15c	15c	10c
Belvidere	....	....	....	....	50c	....	....	....
Booker	15c	10c	20c	....	5c	....	....	....
Caledonia	40c	35c	25c	....	20c	15c	15c	....
California	1.40	1.15	1.20	75c	80c	65c	80c	70c
Challenge	....	85c	1	85c	85c	....	90c	....
Chollar	2.65	2.45	2.60	2	2.30	2	2.30	2.05
Confidence	4¼	3.90	4	....	....	....	3.85	3.80
Con Imperial	20c	15c	20c	10c	20c	15c	15c	10c
Con Virginia	3.30	2.70	2⅜	2	2.15	1.70	2.10	1.95
Crown Point	2.45	2.10	2.45	2.05	2¼	1.95	2.15	1.95
Columbus	....	....	....	....	40c	....	....	....
Champion	....	....	....	....	15c	....	25c	....
Concordia	1.10	60c	90c	....	75c	35c	....	....
Concordia (Va)	....	....	....	....	....	....	25c	....
Con Pacific	....	....	....	....	65c	20c	60c	40c
Derbec	....	....	....	....	....	....	....	....
Day	1.90	1.65	1.80	1.55	2.15	1.25	2.30	1.90
E. Mt. Diablo	....	....	....	....	15c	10c	15c	....
Eureka Con	33⅞	30½	31	....	32	31½	31	30½
Exchequer	1.40	1.30	1½	1.10	1.15	1.05	1.15	95c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	50c	25c	40c	....	40c	25c	40c	35c
Golden Gate	2.80	2½	....	....	2.80	....	2.80	2½
Goodshaw	45c	40c	....	35c	35c	30c	35c	....
Gould & Curry	6¾	5½	5⅞	4.30	4.85	4.35	4.80	4.20
Hale & Norcross	4.40	3.85	4	3.20	3½	3.20	3.45	3
Head Center	1.65	1½	1¾	....	1½	1.20	90c	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	55c	50c	55c	45c	45c	35c	45c	35c
Justice	1.10	95c	1.10	90c	90c	75c	95c	85c
Jackson	....	....	30c	....	30c	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2½	2¼	3	2½	3¼	2¼	2.65	2½
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	25c	20c	25c	....	20c	....	25c	15c
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	10c	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhatan	2¼	1⅞	2¼	1¾	2¼	....	2.70	....
Martin White	....	....	....	....	....	....	30c	....
McClinton	....	....	....	....	....	....	....	....
Mono	3.20	3	3.05	....	3¼	3.05	3¼	3
Mexican	11½	9½	9¾	7¼	7⅝	6¾	7⅜	6¾
Mt. Diablo	9¼	....	8½	....	8⅝	8¼	8¼	7¼
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1½	95c	95c	85c	65c	50c	70c	55c
New York	10c	....	....	....	....	....	15c	....
Northern Belle	20	19	19¼	....	19¼	18⅜	18⅜	17½
North Noonday	60c	50c	50c	....	40c	20c	30c	20c
Navajo	60c	....	65c	60c	50c	....	80c	75c
Occidental	1.40	50c	1.40	....	1.20	1.05	1.30	1.20
Ophir	7¼	6½	6⅝	5⅝	5¾	5	5⅝	5¼
Original Keystone	....	....	....	....	....	....	....	....
Overman	1½	1.40	1.70	1.55	1.45	1.15	1.35	1.05
Oro	95c	85c	1.10	95c	90c	70c	60c	65c
Paris	....	....	....	....	....	....	....	....
Potosi	3.35	3	3¼	2.20	2.65	2.15	2.70	2.35
Queen Bee	5c	....	5c	....	....	....	....	....
South Bulwer	35c	5c	....	....	35c	....	....	....
Savage	3.45	2.95	3	2.45	3	2½	3.05	2.40
Seg Belcher	7½	7	....	....	....	....	9¼	....
Sierra Nevada	13½	10½	11¼	8⅞	9⅜	8¼	9¼	8¼
Silver Hill	35c	25c	30c	....	25c	20c	20c	15c
Silver King	22	21½	22	21½	21⅞	21½	21⅝	20
Succor	....	....	....	....	....	....	....	....
Summit	25c	....	....	....	30c	25c	25c	....
Scorpion	1.70	1.30	1½	1.20	1.20	1	1.20	1.10
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	10c	5c	10c	....	....	....	5c	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	35c	30c	30c	25c	40c	35c	40c	25c
Stops Con	65c	50c	60c	....	50c	40c	40c	....
Tiptop	4.05	3.80	4	3.90	4.95	4¼	4.90	4.80
Tuscarora	25c	....	....	....	....	....	....	....
Union Con	12⅞	9⅞	12⅜	9	10	8⅞	10½	8⅞
Utah	10⅜	8¼	8¼	7	7⅜	5¼	6¼	6
Ward	2¾	....	2¾	....	....	....	....	....
Wales	1½	1.45	1.65	1.60	1¼	....	1¼	1¼
Yellow Jacket	5½	4.85	5¼	4.60	4.80	4.10	4.65	4.15

Sales at S. F. Stock Exchange.

Thursday A.M., July 21.

30	Alpha	275	Union 9⅞@9¾
200	Alta 4.20	110	Yellow Jacket 4.40@4.45
110	B & Belcher 9⅝		AFTERNOON SESSION.
160	Belcher 2.90@2.95	380	Alhion 3.35
280	Bullion 60@65c	500	Bodie Tunnel 2½@3
200	Benton 1.05	50	Boston 60c
300	Con Virginia 1.95	100	Black Hawk 10c
400	California 75@70c	550	Bodie 6¾
300	Chollar 2.30	100	Bechtel 1.65
70	Crown Point 2.05	100	C Pacific 30c
30	Con Imperial 10c	1100	Day 2.45@2.40
300	Exchequer 1.10@1.15	50	Eureka Con 30½
430	Gould & Curry 4.60@4.65	100	Grand Prize 30c
40	Golden Gate 2.60	100	Holmes 60c
140	Hale & Nor 30@30½	200	Head Center 85c
300	Justice 90@95c	400	Mono 3.10
100	Julia 35c	55	Mt Diablo 7¼
100	Lady Wash 15c	170	N Noonday 25@20c
100	Mexican 7¼	50	Northern Belle 17⅞
90	Ophir 8⅜	100	Navajo 1
570	Overman 1.15@1.20	50	N Belle Is 45c
300	Potosi 2.60@2.70	100	Noonday 75c
300	Sierra Nevada 9¼@9	150	Oro 70@75c
400	Sutro 20c	300	Star 50@60c
260	Scorpion 1.10	150	Silver King 20½@20¾
20	Utah 6¾	250	Tiptop 4.90
		350	Wales 1.05

Of $6,288,585 paid in dividends by the principal dividend-paying mines of the country for the six months ending June 30th, the Ontario is credited with $350,000, and is the only Utah mine which figures in the list. But of course it is not the only one worked at a profit to its owners.

Capt. Burbridge, Superintendent of the old Dominion Copper Mining Co., says the Globe (A. T.) *Chronicle*, has left on a trip to San Francisco to order hoisting works for the company's property, and attend to the shipment of the two 36-ton smelters, which will soon be ready.

The miniug superintendents of Eureka have issued a pamphlet showing the great ore-producing record and capacity of their camp, in which they set forth that Eureka has two mines which alone have paid morc in dividends than all the dividend-paying mines of Colorado.

Reports of claims being jumped, come from Grapeville District, San Bernardino.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda M Co	California	5	10	July 11	Aug 17	Sept 6	T H Dixon	238 Montgomery st
Alpha Con M Co	California	14	1 00	June 20	July 25	Aug 15	W Willis	309 Montgomery st
Argenta M Co	Nevada	8	10	July 7	Aug 11	Sept 2	E M Hall	327 Pine st
Belle Isle M Co	Nevada	2	15	June 3	July 11	Aug 2	E M Hall	327 Pine st
Best & Belcher M Co	Nevada	21	50	July 12	Aug 16	Sept 7	W Willis	309 Montgomery st
Caledonia M Co	Nevada	36	25	July 7	Aug 11	Aug 31	R Wegener	414 California st
California M Co	Washoe	4	30	June 30	Aug 6	Aug 25	C P Gordon	309 Montgomery st
Con Pacific M Co	California	3	40	July 9	Aug 1	Sept 1	F E Lutz	330 Pine st
Equator M Co	Nevada	4	25	June 7	July 12	Aug 1	W Willis	309 Montgomery st
Gould & Curry S M Co	Nevada	40	50	July 15	Aug 19	Sept 8	H K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	70	50	July 12	Aug 16	Sept 7	J F Lightner	309 Montgomery st
Mexican G & S M Co	Nevada	16	1 00	June 28	Aug 2	Aug 22	C L McCoy	309 Montgomery st
Mayhelle Con M Co	California	8	20	June 22	July 29	Aug 22	W J Taylor	310 Pine st
Martin White M Co	Nevada	10	25	June 18	July 30	Aug 25	H L Scoville	309 Montgomery st
Murchie M Co	California	6	15	June 10	July 11	Aug 10	S D Rogers	328 Montgomery st
Oro M Co	California	8	10	June 1	July 5	July 24	W Stuart	320 Sansome st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona Mexican M Co	Arizona	1	50	June 7	July 15	Aug 8	G R Adams	320 Sansome st
Betty O'Neal M Co	Nevada	1	50	June 14	July 19	Aug 9	R W Heath	318 Pine st
Black Hawk M Co	California	12	10	July 15	July 19	Sept 8	H A Charles	419 California st
Con El Dorado M Co	Nevada	2	10	June 27	Aug 12	Aug 13	J M Buffington	339 California st
Eintracht Gravel M Co	California	7	5	June 14	July 21	Aug 9	H Kunz	209 Sansome st
Fresno Enterprise M Co	California	1	15	June 1	July 1	Aug 1	W H Allen	306 Pine st
Harrington M Co	California	2	5	June 15	July 20	Aug 11	I C Miller	409 California st
Holmes M Co	Nevada	2	10	June 22	July 25	Aug 15	E A Holmes	318 Pine st
Iron Clad Con M Co	California	1	01½	May 25	July 10	Aug 10	A Dott	309 Montgomery st
Lodi M Co	Nevada	3	05	July 19	Aug 22	Sept 12	A B Paul	328 Montgomery st
McMillen M Co	Arizona	3	20	Jan 12	June 12	July 27	J Morizio	328 Montgomery st
May Flower G M Co	California	12	10	July 19	Aug 23	Sept 13	J Morizo	328 Montgomery st
Morgan M Co	California	7	50	July 8	Aug 16	Sept 13	J Raphael	533 Kearny st
Mount Potosi M Co	Nevada	—	10	June 9	July 16	Aug 8	H H Sayre	330 Pine st
New York M Co	Nevada	26	10	July 16	Aug 18	Sept 8	D L Thomas	327 Pine st
Noonday M Co	California	3	50	June 28	Aug 3	Aug 26	Wm J Traylor	310 Pine st
North Noonday M Co	California	3	50	June 28	Aug 5	Aug 29	Wm J Traylor	310 Pine st
North Gould & Curry M Co	Nevada	1	25	July 15	Aug 15	Sept 6	N C Southard	331 Montgomery st
Paris M Co	California	2	25	June 22	July 27	Aug 17	W J Taylor	310 Pine st
Occidental Con G M Co	California	7	04	May 9	July 7	Aug 2	W T Smith	414 California st
Paris M Co	California	2	25	June 22	July 27	Aug 17	Wm J Traylor	310 Pine st
Rocky Point M Co	California	8	05	June 21	July 25	Aug 15	W G Hughes	330 Pine st
Red Cloud Con M Co	California	10	20	June 22	July 27	Aug 17	W J Taylor	310 Pine st
Sierra M Co	Nevada	69	1 00	July 15	Aug 18	Sept 6	E L Parker	309 Montgomery st
Steep Hollow G M Co	California	6	1 50	June 21	July 26	Aug 18	J W Pew	310 Pine st
Spaulding G & S M Co	California	2	10	June 28	Aug 23	Sept 15	J W Pew	310 Pine st
Swamp Angel G M Co	California	4	12½	June 14	July 18	Aug 4	L Little	607 Washington st
Union Con M Co	Nevada	17	1 00	July 1	Aug 4	Aug 24	J M Buffington	320 California st
Utah S M Co	Nevada	35	2 00	June 28	Aug 5	Aug 23	G C Pratt	309 Montgomery st
Wolverine Gravel M Co	California	2	10	May 31	July 1	Aug 1	P J Blaudin	325 Front st
Wide Awake M Co	Arizona	13	10	June 4	July 18	Aug 10	C Hildebrandt	Cor Bush & Monty

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Benton Con M Co	California	W H Watson	302 Montgomery st	Annual	July 23
Hillside M & M Co	Nevada	N Frankenthal	121 Battery st	Annual	July 27
Justice M Co	Nevada	T Widman	404 Montgomery st	Annual	July 18
Lady Washington M Co	Nevada	W H Watson	302 Montgomery st	Annual	July 27
Liberty Hill M Co	—	J W Pew	310 Pine st	Annual	Aug 1
Northern Light G & S M Co	—	F S Monroe	310 Pine st	Stockholders	Aug 1
McMillen M Co	Arizona	J Morizo	328 Montgomery st	Annual	Aug 3
Mt Potosi M Co	Nevada	H Lowden	330 Pine st	Special	July 25
Original Keystone S M Co	California	F E Luty	330 Pine st	Annual	Aug 2
South Comstock Con M Co	Nevada	J M Buffington	309 California st	Annual	Aug 15

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	July 20
Father De Smet M Co	Dakota	H Dean	New York	50	June 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	July 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	July 15
Silver King M Co	Arizona	J Nash	315 California st	25	July 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	July 12
Western M Co	California	C S Curtiss	309 Montgomery st	75	May 12

The Mining Share Market.

The stock market has heen a littlc bit excited this week over the Alhion lawsuit, and the Savage election. Otherwise, nothiug of interest has trauspired. On the Comstock, according to the *News*, the situation is encouraging for the Gold Hill group. Yellow Jacket has hut fairly commenced the work of prospecting. The strike made in its grounl by the south header of the Sutro tunnel is of great importance, and in days gone by all eyes would he attracted to that point and the stock would he the liveliest on the list, hut now there seems to be a serpent fascination for dealers at the north end which prevents them from glancing around or investing elsewhere. Crown Point and Belcher, too, are extracting no small amount of ore at the present time, and they have good indications of finding in their lower levels something hetter than the low-grade ore taken out above. The Kentuck has hnt recently heen started up, and is not uow iu a condition for active work, yet 10 tons of ore are daily taken from it, and quite a number of men are given employment. In fact, it is worthy of uote that more men are to-day given employment in the Gold Hill mines than at any time in the past two years and a half, and it is exceedingly prohahle that the nnmber will he increased before long. It is exnected that the Bullionville will he worked shortly; the snhstantial preparations made there would surely indicate as mnch, outside the assurance of the management that snch is to he the case.

More or less prospecting is uow carried on in the mines from the Hale & Norcross to the Sierra Nevada. Good air circnlation has heen secured in all the mines under Bonanza control, and drifts and crosscuts have heon, or will be shortly, started in every direction and pushed rapidly. Taking everything into consideration, the outlook is hy no means as dark as many would fain to helieve, and there will surely he fonnd a silver lining of prosperity to the present clond of depression.

Men who have millions in mines, and who have heen all over the Black Hills and seen everything in Utah, Colorado and Arizona, not long since told a Reno *Gazette* reporter that Eastern Nevada was the best mining country in Amcrica; that it was the most heavily mineralized, and had the hest ledges of any district yet discovcred. They say that the country is not half prospected and that they have every faith of a grand future. One of these gentlemen was J. C. Gilmer, the stage man, who is a good judge of such matters.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Silver King, July 11th, $25,646; Indian Queen, July 11th, $4,656.46; Mt. Diablo, July 12th, $8,188.58; Bodie Tunnel, July 18th, $3,500; Bodie Con., July 18th, $7,335; Mt. Diablo, July 15th, $6,563.55; Star, July 9th, $12,336; Northern Belle, July 13th, $6,762.29; Head Center, July 18th, $7,028; Hanauer, July 16th, $1,750; Christy, July 17th, $1,617; Horn Silver, July 16th, $2,500; Ontario, July 16th, $11,460; Custer, July 15th, $4,218; Christy, July 15th, $1,871; Stormont, July 15th, $3,928; Western, July 16th, $15.269 77; Northern Belle, July 16th, $8,406.92; Hananer, July 15th, $1,850; Germania, July 15th, $2,450; Mayflower, July 15th, $3,800; Horn Silver, July 15th, $35,000; Bullionville, July 15th, $2,318; Ontario, July 15th, $9,061.

The Eureka *Leader* says: The recent developments in the Geddes & Bertrand have given an impetns to the owners of mines in Secret canyon and the southern end of Prospect mountain. A tnnnel to cnt the mines in this end of the mountain is now projected, and it is possible that one or more mines in the vicinity will shortly change owners. The Basey, Irish Embassador, Burning Moscow, and other claims, have all shown up well and will undouhtedly prove among the hig mines of the future.

The Marysville *Appeal* of the 15th inst. says that four men were in that city the day preceeding with $50,000 in gold hars in their possession. The treasure was the result of the eeason's working of two hydraulic minee. The names of the men are J. P. Denson and F. Gourly, of Gihhonville, and George W. Cox and J. F. Williams, of Howland Flat. They were on their way to San Francisco to mint their hullion.

The principle of the hydraulic pump in the C. N. S. shaft has been demonstrated to he correct, and it only remains for the machinery to he manufactured strong enongh to hear the necessary pressure to adapt it to deep mining on the Comstock lode. The managers of the companies interested believe they have accomplished this result, and a further trial of the pump will he made this week.

I. N. Knight has returned from the East, says the Wood River *Times* of July 13th, having accomplished all that he went there to do. He succeeded in organizing a company in Council Bluffs to erect a 40-ton smelter in Croy's gulch, abont half a mile west of Hailey. The company has a capital of $100,000. Four of the directors will be here in a few days, and the location of the works will then he decided on.

Mining Summary.

The following is mostly condensed from journals puhlished in the interior, in proximity to the minss mentioned.

CALIFORNIA.

AMADOR.

Quartz Mountain.—Amador *Ledger*, July 16: This mine and mill at Lower Rancheria recommenced operations last Monday, after a period of idleness of over a year. Messrs. Williams and Woodbury, we believe of San Francisco, are mainly intercsted in its present activity, the latter gentleman being in charge of the works.

Miscellaneous.—S. H. Clark has struck some good paying blue gravel in his cement claim near Oleta.

The tunnel at Murphy's ridge makes slow progress. It has heen run a distance of about 400 ft since the work was resumed. No body of quartz worth speaking of has been encountered as yet.

Sutter Creek.—Sinking in the Amador is still rapidly progressing. A depth of about 800 ft from the surface has been attained. Two or three months more of sinking will meet all requirements for prospecting. In the Down shaft, north of Lincoln, things are moving slowly. Fou or five mnn are employed sinkiug, and everything apparently is going along satisfactorily. This new pumping machinery at the Mahouey was started last week, and works admirably. The taking of water from the shaft is proceeding satisfactorily. It will requirs about two weeks to drain the shaft.

Volcano.—Rich rock has been struck in the Wide West mine, located near the Acme, both being under the supervision of Mr Kelly. The ledgs is 4 ft wids, and contains free gold. It is estimated that the rock will pay about $75 per ton. Rich rock has also heen struck in the Coso mine, located in Pioneer district, and owned by Haskell & Co. The width of the ledge is 20 inches. Operations continue day and night.

Started Up.—The Golden Gate mine, located on Sutter crsek, one mile above town, has been started up with all indications of a favorable run. The timhering of the shaft has been completed, new hoisting works have heen erected, and an addition pnt on. Over $10,000 has been oxpended in procuring the necessary machinery and making preparations for the commencement of a new run. J. Moyle, the Superintendent, has returned from Arizona, where he has heen examiuing mines.

CALAVERAS.

Norwich Mine.—July 9th the main shaft had attained a depth of 185½ ft. A new 3-4 wire cahls has been put in the north compartment, and another of the same dimension was on the ground, and will he put in the south compartment, which will be made ready for it in a few days. An ore dump, the capacity of which is 150 tons, will be completed this week. All necessary castings, etc., for putting the battery of the 18-stamp mill in perfect working order are on this ground. The work of improving and re-modeling the mill is under way, and will he completed in about two weeks. Immediately thereafter, the mill will be started up on Norwich ore, of which there were many tons raisod while in the course of sinking, and which was encountered in the downward progress of the shaft.

West Point Notes.—At the Champion mine, stoping on the 700 level still continues. Mill kept running night and day on good rock. We understand that some of our energetic citizens are contemplating a lease of that well-known mine—the Lone Star. The amount is close on to $25,000. Rose & Jenkins are still sinking the main shaft on the Henry lode; width of vein, 18 inches, showing plenty of gold and sulphurets. Present depth of shaft 108 ft. Ferguson & Co. are engaged in sinking the main shaft of the Colorado mine with the air-drill. The quartz in shaft shows plenty of free gold. Kelly & Co. are taking out some splendid rock from the Constitution mine. Staeger & Co have struck a large body of quartz near the Duna mine which prospects good. Width of vein 3 ft. Everybody and everything is kept busy at work in or about the mines of this district, which ars opening up to the satisfaction of their owners.

Glencoe Items.—Mr. Clark is still operating in Specimen gulch. The ditch that will convey the water to the Valentine is now completed. It makes the third that Mr. C. has made this season. Lewis & Fairchild have commenced stoping. They are taking out some good rock.

Southern Mines.—*Mountain Echo*, July 12: Operations have commenced on the Jones mine. Six or seven men are ready at work. In grading off a place to sink a shaft, gold was discovered in the croppings. Second grade ore at the Collier mine pays $180 per ton. We were shown some specimens of ore last week taken from Uno mine in Nassau valley. It is very good looking rock, and some specks of gold were visible upon the surface of the quartz. The new hoisting works on the McElroy mine are about completed, and work will be commenced in a few days. The Monarchville mine is being vigorously worked, and is looking splendid.

EL DORADO.

Mining Activity.—*Mountain Democrat*, July 16: Very great activity prevails in and about the mines over which W. K. Aldersley holds the superintendency—the Chaparral and the Gopher and Bowlder mines, in Kelsey district. At the Chaparral, tunnels are being run on the main ledge both north and south of Kelsey creek, with no material change in size or appearance of ledge, or in quality of ore. At the Oopher mine the old "Sip incline" has been sunk to greater depth, and drifts are being run from both directions to connect it with the main shaft recently sunk. The new tuunel that was started a few weeks ago for the main Bowlder ledge is now in over 100 ft, and is making rapid progress. Even with the small amount of work that has been done, in a short time and at insignificant cost in the main shaft and incline not less than 15,-000 tons of good millings are now be exposed. In the two claims, above the level of the mill, we estimate that there is not less thau 150,000 tons of ore. The quartz they are now taking from the incline will average over $20 per ton

High Grade.—Georgetown *Gazette*, July 15: A vein of high-grade ore, some 3 ft wide, has been discovered in the crosscut now being made from the shaft to tap the ledge on the third level of the Eureka mine. It is thought to be about 32 ft from the bottom of the shaft to the main lode, and the new or oranch ledge was met with when in on the crosscut about 9 ft. This rock is thought to be far above the average of this main lode, and shows very well in free gold. As Mr. Baird remarked, this is a mine in itself. This same vein of quartz was met with in the shaft some distance above, but was not more than one-half as wide, and although it prospected very well, little was thought about it. From the angle of its dip, it is estimated that the contact with the mother lode takes place about 100 ft farther dowo. Other smaller stringers prospecting fair in free gold have been met with, most notably one near the bottom of the shaft, all dipping east toward the mother lode. It is enough for us to repeat the prevailing sentiment of our practical miners that the Eureka mine is a grand success, and promises to rank among the best permauent dividend paying mines in the State.

INYO.

Deep Springs.—Inyo *Independent*, July 16: After 6 days of hard work in examining the very numerous fine mining properties of Deep Spring district, Capt. H. H. Todd and Mr. A. H. Griswold left by the northern line on Tuesday last. They took with them complete samples from every point, for assaying at Benton and San Francisco. They have gone to Columbus to examine a mill there, with a view to its immediate removal to Deep Spring.

Panamint.—During last week a great water spout broke in Panamint canyon, destroying 6 miles of the fine and costly grade, so that it became necessary to build a trail to get a pack-mule over it. The water, which has been decreasing in the canyon for a long time, is now more plentiful. A party of Eastern men, headed by Geo. M. Pinney, is expected in the camp. Messrs. Phehy & An-

thony shipped silver bullion to the amount of $6,000 last Tuesday.

MINES BONDED.—Bonds for deeds to mining property were placed upon the county records July 11th, as follows: The New Year and Golden Wedge mines, by Swearingen, Walmright & Buckles to Ed. Loose; consideration $7,500, to be paid November 30th. Also, the Red Cloud and 200 ft of the Emmett mine, by Jos. and Jas. Rowan to C. E. Loose and R. A. Russell; consideration of deed $10,000, the bonding parties to carry on such work of development as they please in the meanwhile. The properties are situated in the Bishop Creek district, near Antelope springs, and are said to be valuable mines, bearing mostly gold.

THE PAJARO.—We hear that it is the intention of Messrs. Storey and Ford, resident managers of the big gold mine at Bishop creek, to prosecute the work of development from 250 to 350 ft in depth as rapidly as possible. Reduction works will then be placed upon the property on a scale commensurate with the showing of ore.

MONO.

BODIE.—*Free Press*, July 19: It takes a great deal of time and labor to open up a mine, even when the ore body is found, and how much longer does it require a company to explore its ground. A great many people are growing impatient because great developments are not being made in Bodie district, but those who look at the matter coolly are satisfied that the developments will come in time and when least expected by the outside. The Standard has a great deal of ground on the 1000 level yet to investigate; in fact it can be said that that level is entirely unexplored. The character of the ground they are now working in is favorable, and the management feel no discouragement. A crosscut has been started west from the 600 level of the Red Cloud. This drift will, it is believed, show up something good, as it is to explore a portion of the Concordia ground. Ore never looked better than it does at present. During the past week a large number of visitors were admitted to look at the developments recently made, and they all speak in glowing terms of the prospects. The Addenda has also the prospects of becoming a good mine. Bechtel is crushing ore, and it assays better than at first expected. Grading for the Bodie Tunnel mill has commenced, and the work will be pushed forward as rapidly as possible. The Bodie Tunnel has very large showing of ore, and the ground is but little prospected. The Supt. of the Con. Pacific states that a streak of rich ore has been encountered on the 600 level, and it assays well. Prospecting is still going on in the Noondays, and the Bodie Con. continues to ship bullion. During the past week the Standard Co. shipped $14,390.05.

MARIPOSA.

BIG FLUME.—Mariposa *Gazette*, July 16: Col. W. W. Swadley, of the Red Banks, was in town one day this week. We learn the Col. has completed arrangements for the building of a flume 1½ miles in length and 4 ft in width, from the Benton mills dam to the Red Banks hydraulic mine, which will furnish a sufficient supply of water for the immense works at that place. We have always contended that the Red Banks contained vast wealth, and the building of this flume confirms our assertion.

SIXTEEN OR TWENTY.—The silver mines below town—that is both companies—employ between 16 and 20 men at the present time. Things appear to be quite lively in that section now. There is no doubt but immense wealth is deposited in these mines.

NEVADA.

REMOVING THE MILL.—Nevada *Transcript*, July 14: E. H. Dyer, of Alameda, one of the principal owners of the Republic quartz mine, at Granitoville, which has been idle for several years, went up to the claim yesterday morning to complete arrangements for removing the mill (a 40-stamp one we are told), to Oroville, where it is to be re-erected to do custom work. There are a large number of small auriferous quartz ledges in the vicinity of Oroville, but it is said that so far there have been no milling facilities so they could be worked.

NO MORE CHINESE.—Nevada *Transcript*, July 19: The only obstacle in the way so far to complete harmony of action between the people of the mountains and the hydraulic mining companies has been the fact that some of the latter employed in certain departments Chinese laborers to the exclusion of white men who were willing to do an honest day's work for fair wages. But at last, thank God, an order has gone forth that no more Celestials need apply at either the North Bloomfield or the Milton mines. We have this from the very best authority, and can confidently assure our readers that the new order of things is to be permanent. Since writing the above we are informed—not officially, however, that the Blue Tent Co. have concluded to dispense with Chinese labor in the future.

BANNER MINE.—Nevada *Herald*, July 10: The indications at the Banner mine are now very encouraging. The ledge at the bottom of the incline is 14 inches wide, and the quartz taken from it is heavily charged with high grade sulphurets. A crushing of rock is now being had at Martin & Michell's mill, at Canada hill, but it is thought the yield will not be very large, as there was considerable waste and inferior ore mixed up with the quartz. The last crushing paid about $25 to the ton.

PLUMAS.

AN EXTENSIVE OPERATION.—Plumas *National*, July 10: One of the most extensive prospecting enterprises inaugurated in Plumas county has been put in operation in this valley during the past two or three months by Prof. J. E. Mills, of Boston. After a thorough survey and a prolonged and exhausting examination of the numerous channels at the head of the valley, he has evidently arrived at the conclusion that a very large amount of gold has been deposited on the bedrock of the valley, and he is now making extensive arrangements to find it. His staff has been located on the old Stinson ranch, half a mile from town, and a short distance to the west of the road. A large double shaft has been started and put down a few feet by hand. Over this is now being built a very substantial frame-work to hold the necessary machinery to put this shaft to bedrock. The timbers are large, and evidently selected for permanency and durability. A boiler, engine and pump are on the ground, ready for use as soon as they can be put in place, and a number of carpenters, under the direction of Mr. A. J. Quigley, are pushing the work as rapidly as possible. Just how deep it will be necessary to sink is not known, and estimates of the depth go all the way from 200 to 400 ft.

GRANITE BASIN.—Mr. T. H. Ward came up from the Basin on Monday. From him we learn that the mines are looking well, and the owners are pushing along as rapidly as possible. The Franklin mill started up a week or so ago, and will be kept running steadily from this time on. They have experienced considerable trouble in their main tunnel by striking some wet ground, which has proved exceedingly difficult to handle, but the difficulty has been overcome, and they are now going ahead in good shape. Minto & Co., who bought the Sullivan & O'Brien claims, are running the tunnel ahead steadily, and are now in splendid rock. They have a large mill on the road, and will put it up as soon as possible after it arrives. There is no question as to the value of their mine, and they have abundant means to make all necessary improvements. A. P. White has been running his mill with good results, and his property is said to be looking well. Considerable prospecting is being done, and everything looks prosperous for the Basin country. The most pressing want of that section is the proper machinery for working the sulphurets, and it is hoped that works of this character will be built there before the season is over. We are inclined to think that some capitalist could make a splendid investment of a few thousand dollars by putting up chlorination works at some central point in the Basin and working the sulphurets from all the mines. There is no question as to the value of the sulphurets, as assays from all quarters demonstrate that they are rich, but under the present working no gold from them is saved. A little capital would prove Granite Basin one of the best quartz districts in Plumas.

GOOD.—Greenville *Bulletin*, July 12: Corbin & Co. are getting good returns from their gravel claim at Elizabethtown. Last Thursday $480 was taken out, one chunk alone being worth $195. W. S. Dean, of Prattville, called here last Friday, on his way to Granite Basin, where he is interested in mining, and will soon erect a mill. He has a quartz gravel claim covering 20 acres of a rich deposit, and proposes to work it with light stamps, of not over 350 to 400 lbs. each.

PLACER.

THE RISING SUN MINE.—Placer *Herald*, July 16: The new 20-stamp mill at the Rising Sun mine was completed and put in operation last week, and everything is running as smoothly and satisfactorily as could be desired. The mine throughout presents quite an improvement in appearance, with plenty of good ore in sight, and promises handsomely to reward the company in the way of big productions. The mine, which has for years borne the reputation of a first-class, will soon be in a way, with the increased force of men, to eclipse its former excellent record as a bullion producer. The new Arnold shaft, situated about 700 ft from the present workings, has reached a depth of 150 ft on a large well-defined ledge of highly sulphureted ore, showing considerable free gold. The new hoisting works being erected on the Arnold shaft are rapidly approaching completion, and in a short time steam will be started up. Altogether during the last couple of months the appearance of the property has undergone considerable change by improvements on the surface and developments in the mine.

DOING WELL.—Placer *Argus*, July 10: The Mountain Gate mine at Damascus is doing splendidly at present, and persons who know anything about the mine agree in saying it is one of the very best mines in Placer county. It has lately paid $400 per share for a 33 days' run, after paying all expenses. There are 21 shares in the mine. The tunnel extends into the hill about 1¼ mile, and runs in a northerly and southerly direction. Recently the miners found a deposit of cement which pitches off. They ran a slope to the bottom of the cement, and then followed it easterly for about 200 ft, when they struck a channel or what is supposed to be an old river bed running nearly parallel with the main tunnel. Between the cement and the bedrock what is believed to be an extensive deposit of fine river gold has been found. It is nearly in the center of the ridge between the north fork of the American river and El Dorado canyon.

SIERRA.

EXTENSION.—*Mountain Messenger*, July 16: The B. M. Extension mine is proving all that its owners expected, On Saturday from one set of timbers (about 28 sq ft), 6 ozs. of gold were taken out. Sunday, from the same space, over 5 ozs., and on Monday from half a set, 3 ozs. The gold is 950 fine and worth here $18.75 per ounce. The company are working 11 men.

ARASTRAS.—John Lavezzola is putting up a lot of arastras on the Jim Kane place, at Sierra city. He has bought the sand pile on the flat above the city, owned by the Buttes men, and will work it.

FOUR HILLS.—Eight men are now at work on the Four Hills mine, Geo. Reynolds, Supt. Everything is progressing smoothly. This claim has the largest outcrop of quartz of any ever discovered in this section, the ledge being as much as 80 ft wide in places.

WILSHOUTH.—The shaft of the Wilbourn Con. mine is now down 140 ft in good looking quartz gravel which prospects. They will evidently touch bottom soon.

THE RUBY Co. ran 240 ft of tunnel for Juno, through hard quartzite rock, with their Burleigh drill, working 27 days, very creditable for Supt. H. W. Wallis.

WAHOO.—The Ohio drift claim has been paying $25 to the pick. There is 900 ft of tunnel in this claim, and 20 men are employed. The Roscoe ground, J. Littick, P. Doray and A. Courtright, owners, is being prospected by a tunnel. In the West Point, James Crooke and others are cleaning out an old tunnel preparatory to opening the mine.

BLUE GRAVEL.—This Co. have let a contract for 100 ft of tunnel.

THE 1001 Co. have let a contract to run 200 ft of tunnel on their load.

PORT WINE.—French Co. are doing well and work 22 men. A tunnel, nearly 900 ft in length, is being run into the back ground of the Queen, and the men are kept busy. Work may soon be resumed in the Union drift claims, that are believed good diggings, as the noted Monte Christo diggings, on the opposite ridge, paid $2.75 to the pick. D. McLaughlin has been drifting, but has concluded to turn his claim into hydraulic diggings.

NEVADA.

WASHOE DISTRICT.

CON. VIRGINIA.—A sump is being excavated for the winze-joint with the California, and on the 2500 level are engaged in cutting out a station for the same winze.

HALE & NORCROSS.—The sinking of the three-compartment winze from the 2400 level is retarded by the flow of hot water encountered last week.

CALIFORNIA.—Are extracting the usual amount of ore. It is of fair grade, and taken from the 2000 level.

CHOLLAR-NORCROSS-SAVAGE SHAFT.—The hydraulic pumps are running nicely. Some changes are in contemplation that will add to their completeness, and they will be made shortly.

SUTRO TUNNEL.—The south lateral drift was driven 88 ft the past week. Total distance in, 4,226 ft. The face is in hard ground, with andesite rock.

KENTUCK.—In cleaning up the old drifts, and opening out working stations, about 10 tons of ore are daily extracted from the various levels. The ore and waste is brought to the surface together and sorted on the dump.

SIERRA NEVADA.—The ore extracted the past week assayed $20 to the ton. There was a slight falling off in the amount, as only 40 tons were taken out.

BULLION.—The air compressor is in place. A pump hoist has been sent for and preparations are making for its reception when it arrives from San Francisco.

YELLOW JACKET.—The east drift on the 3000 level is run 42 ft per week, and is in a total distance to-day of 214 ft from the shaft.

UNION SHAFT.—The foundation for a pump on the 2700 level has been completed and the work of putting in the pump commenced.

ALTA.—The main line of pumps are working well. An Ingersoll drill is used in the bottom of the shaft for sinking.

FORMAN SHAFT.—A strong flow of water was struck in the bottom of the shaft last week.

ESMERALDA DISTRICT.

PROGRESS IN THE CAMP.—Esmeralda *Herald*, July 10: The mines at work are looking better every day, and as depth is attained in them the rock improves in proportion.

THE CENTENNIAL.—The east drift on the 150 level has been advanced several ft during the week, and is now in about 160 ft. The ledge in the face of the drift is looking well. The incline has attained a depth of about 213 ft, and the ledge in the bottom is much stronger and richer than at any other point.

CORTEZ.—The rich ore dump is rapidly assuming proportions gigantic, several tons having been added this week in driving the drifts and incline. The average of the rock is fully $200. The east and west drift has been advanced 10 ft each for the week ending last night, making the former 49 and the latter 64 ft. The east drift shows narrow streaks of very rich ore, while the whole face of the west drift is of $200 ore.

THE HUMBOLDT WEST.—The hoye are drifting south on the ledge, and have made fair progress for the week. The ledge continues to show the same character of ore as that found in the crosscut.

TEM PAHUTE DISTRICT.

PROBABLE RESUMPTION OF WORK.—Pioche *Record*, July 9: Indications all point to a resumption of work in this district at an early day. A mill site has been taken up for Mr. Cardeza and sent here to be recorded. There is now a strong effort being made by a number of parties interested in Tem Pahute property to get a little capital in that place; heretofore, however, they have always endeavored to keep capital out, throwing every obstacle in the way they possibly could, but now as the prospectors in the district are about starved out, they are willing to act half-way decent.

WASHINGTON DISTRICT.

THE OUTLOOK.—Cor. Esmeralda *Herald*, July 16: Having been on a prospecting trip in this district for about 2 weeks, I thought a few items in regard to the camp might be interesting. The mill consists of a Huntington I-stamp battery of 900 lbs. weight, which breaks and grinds the rock at the same time, and a Dodge concentrator, which concentrates 10 tons into 1. The capacity of the mill is 3 tons every 24 hours. As the mill has proved a success in California and Arizona, Supt. Bisson is positive that he can make a success in working the ores of this district. Should the Bower Co. conclude to buy ores of the miners and give them a certain per cent of the assay value, it would be but a short time before there would be 200 men at work here. The country rock here is granite, and the ledges are narrow and numerous, and the most of them are very rich. The only thing that is needed to make this a good camp is machinery that will work the ore successfully and cheaply. The general appearance of the country is very rough; the river rushes and foams down through a narrow gorge in the mountains, affording the finest water privileges to be found anywhere; the hillsides rise abruptly and almost perpendicular from the riverside to a hight of from 200 to 500 ft. Supt. Bisson has about a dozen men at work, and intends to put more to work as soon as he can procure more tools. The more I see of Esmeralda county the more I am astonished at the large amount of mineral country that is lying idle; but it will not be so long.

ARIZONA.

GLOBE DISTRICT.—Globe *Chronicle*, July 11: Hoisting works will be in position on the Mark Morris by Monday, when work will proceed more rapidly than ever. Mine looking splendid.

SILVER FAME.—Although no work has been performed on this property for several weeks, it looks well as far as development has gone, and has promise of becoming a very valuable property. The 50-ft shaft shows a streak of very rich chloride ore from top to bottom.

PINAL COPPER CO.—We learn from reliable sources that the smelter of the Pinal Copper Co. will be in operation within another month.

GOWAN.—This property is located on the east fork of the Verde. The ledge has been cut on the surface, showing a width of 14 ft of ore, all of which carries gold in paying quantities. A 2-inch streak of exceptionally rich ore runs through the ledge.

SHERMAN.—We were shown some exceedingly rich ore from this property a few days ago, which recent work has developed, and the prospects are favorable for coming into a large body of it. The Sherman is unquestionably located on the Stonewall ledge.

EAST RICHMOND.—Mr. Risbridger, one of the owners of this valuable property, is taking out some very rich ore, and it is quite probable that he will soon be ready to make a good-sized shipment of it to San Francisco, there being no mill available in the district. The main shaft has reached a depth of 100 ft, from which a drift has been run 70 ft east toward the Mack Morris, and shows a magnificent body of ore.

THE STONEWALL, No. 1.—Development is being pushed rapidly, with gratifying results. An iron whim is being put on the main shaft. A splendid specimen of work is seen in the timbering of this shaft, which will be extended to a depth of between 200 and 300 ft before further crosscutting is done. Twelve tons of rich ore is being hauled daily to the mill, and as soon as hoisting facilities are improved the ore output will be much larger.

SILVER NUGGET.—Supt. Lennon is pushing work ahead rapidly on this property. In the north drift the vein is 3½ ft in width, and a good showing of ore is made. The east crosscut on the same level is in 110 ft.

TONTO BASIN.—We learn that Wm. C. Groseo, who left here some weeks ago for the Touto Basin country, has made a good strike in a property owned by Messrs. Benbrook, Hobbins, Birchett and himself. A clean-up from 25 tons of their ore worked in an arastra last month produced upwards of $2,000, fine gold.

SADDLE MOUNTAIN.—Dick Martell has just returned from Saddle mountain. Mr. Martell is very favorably impressed with the outlook of the district, and thinks that in the near future a lively, booming camp will spring up. There are five parallel veins running through the district, all of which carry high grade carbonate ore. These properties being located not far distant from the newly discovered coal fields, will doubtless become very valuable as soon as active development is commenced.

MORTGAGED.—Arizona *Journal*, July 14: The Holland S. M. Co., in the Patagonia district, have mortgaged the mine, with furnace, personal property and all the appurtenances thereunto belonging, for the sum of $50,000 to the Union Trust Co., of New York city. Terms, 3 years at 6%. It is understood that this has been negotiated for the purpose of discharging existing liabilities and proceeding at once with a fuller development of the property.

CONTINENTAL.—Pinal *Drill*, July 15: The tunnel in the Australia is 22 ft, a large body of ore is in view, the ore in the vein is fully 3 ft wide and looks well. We have assays at $30 to $170; some is smelting and some free milling ore. Additional smelters are being put up at Willow springs for running some of this ore and that from the Nacoocha, on the same ledge, into pigs. The Nacoocha shows a vein of carbonate and galena over 3 ft wide, and a large body of ore is exposed which is very readily mined and smelted.

THE WINDSOR Co.'s new roaster is in place, but the work is delayed for want of some little articles and appurtenances which were not shipped with the roaster, by mistake or neglect.

SHIPMENT BY SILVER KING.—Sixteen hars, 19,931 ozs., value, $25,640.02. We have seen a large block of ore from the depth of over 700 ft, very rich and full of free silver. Same character of ore as above. The mill is running full force.

FLORA MORRISON.—Tombstone *Epitaph*, July 10: The new hoisting works will not be running as soon as heretofore stated, owing to some defect in the bed-plates of the engine, which have to be duplicated in San Francisco. Work in the mine goes forward with the usual rapidity.

SULPHURET.—Work setting the pump boiler goes rapidly forward, and by the time the pump arrives this job will be complete, and all that will have to be done will be to put it in and start up. Now that machinery is being put up, the world will soon know something of the extent and richness of the ore body below the water level.

NEPTUNE.—BISBEE.—Since last report all the machinery for the 30-ton smelter has been delivered at Hereford, and the boiler has been set. Carpenters are busy at work on the buildings, and the erection of the engine and smelter will be pushed as rapidly as possible. At the mine, in running a drift to connect the shaft on the eastern portion of the Neptune, with shaft No. 1, a large body of high grade carbonate ore was struck on the 13th inst. Since last report have taken out 25 tons rich sulphide ore from shaft No. 2, and the drift is being continued from this shaft with best of prospects. The outlook for Neptune is first-class.

TOMBSTONE M. AND M. CO.—The ore bodies all continue in much the same condition as at last report. The ore house for the main shaft and southeast workings is nearly complete. The mills are running at their full capacity on ore that will probably hold up to about the same grade as last month, which, if it does, will give an output of nearly or quite $200,000 for the month of July, as against $157,000 for June. All the stamps are wet crushing now, whereas 10 crushed dry during a portion or all of last month.

GRAND CENTRAL.—The foundation for the engine was completed yesterday. The shaft is down 220 ft in good working rock. The boxes will be in running order by the 10th of next month.

VIZINA.—Started sinking main shaft again the first of the week. The point at which they commenced sinking was 336 ft below the collar or top of the shaft. Up to yesterday they had shipped 236 tons of ore to the mill, and will ship as much more during the balance of the month, which will make 472 tons.

WINFIELD.—Near the Merrimac House; shaft down 80 ft; vein, 3 ft wide—the ore all being good grade, much of it very rich in horn silver.

CINCINNATI.—Down 310 ft, the rock working well. They struck a small vein of good looking ore on Friday last which shows they are getting into the ore-bearing country.

BUNKER HILL.—Sinking with good prospects. Will go down 200 ft, when a whim will be put up, and then a level will be run on the ledge to thoroughly prospect it.

COPPER QUEEN.—This old stand-by is looking well in every part. They are engaged in the erection of a whim with which to do their hoisting hereafter. The new smelter will be ready to run as soon as the water in the spring raises from effects of summer rain.

GIRARD.—It is the same old story—work progressing favorably and the ore-breasts looking well. The usual amount of 12 tons of rich ore is sent to the dump every day.

IDAHO.

OREGONVILLE.—Butte *Miner*, July 14: In my last letter I stated that a sale of mining property in this district was about to be consummated. The sale has taken place, and $250,000 has been paid to the following parties: Jas. Glendinning, I. Birdsie, Pat. J. Kelley, E. Strickler, Geo. Crogan, John Means, Luther Johnson, James Neishwander, Davie Bros., Geo. Orr, E. Matthews, John Scanlan, Maw Bros., Ira Foghley and F. Philips. Twelve of this number are old Montana miners. Gibbonsville camp is only 8 miles from the Montana line, and 0 out of 10 in this camp would prefer to have it 50 miles inside of Montana's limits. Taking the Big Hole and Bannack road we are within 05 miles of the Utah & Northern railroad. Four miles of a wagon road will have to be built and this camp will be open to travel 8 months in the year, and we will be able to get our supplies fully 20% lower than at present prices. The new company is named the Golden Circle M. Co. Mr. P. J. Kelley is superintendent. The new company has not commenced operations in their mines yet, but have a force of mechanics engaged in erecting houses. It is the intention of the company to put 100 men at work in their mines in a few weeks. Wages for miners are $3.50 per day, but I would not advise a rush of men to this camp just now.

WOOD RIVER MILL.—Wood River *Times*, July 16: A boiler, 40-horse power engine and all the requisite machinery for a gold and silver mill, was hauled through Hailey last Friday and taken into Croy's gulch, to a point about 3 miles from town, where it will be erected at once. The mill consists of a rock breaker and pulverizer, with shafting, pulleys, engine, boiler, etc, and is warranted to work 1 ton per hour, or 24 tons per day of 24 hours. It is believed to be a very expensive mill to run, but its small cost and the rapidity with which it can be erected probably induced the present owners to buy. It comes new from the East.

THE GALENA SMELTER.—The 30-ton smelter which is about to be erected near the Senate mine at Galena, was hauled through Hailey last Sunday on 5 wagons. It will be taken to Ketchum, where the loads will have to be transferred to light wagons, the bridges between that place and Galena not being strong enough to permit the hauling over them of loads weighing over 5,000 or 6,000 lbs. The smelter will probably be delivered in about 10 days.

EUREKA.—A development, which has given renewed hope to every inhabitant of this section who has heard of it, has just been made in the canyon, about a quarter of a mile above the town of Bullion. Early last week some prospectors working on the Eureka claim cut into a small vein of galena. The development being on the line of the Idahoan, and the formation similar to that of that valuable mine, the prospectors were not long in finding a purchaser in Col Wall, Superintendent of the Bullion and Mayflower, who had had his eye on the claim from the start. Last Wednesday he paid $3,500 cash for it, and half an hour after refused to sell it for $0,000 to C. D. Bradley, Superintendent of the Jay Gould. Thursday morning, Col. Wall put three men at work making a cut into the hill, at a point about 200 ft below the discovery. They had hardly got to work before they uncovered pieces of galena float, weighing several hundred pounds. In a few hours thereafter they cut into a two-inch seam of galena. This was followed by another of about the same size, and still another, but much larger, and yet another. The men now stopped driving the cut, and began stripping their ledge until it was exposed for a length of about 40 ft, and a thickness of about 5. Four seams of galena, aggregating over 2 ft in width, were uncovered altogether. The ore is foliated galena. It carries about 70% lead and an average of 120 ozs silver per ton. This new ore-producer is known as the "Eureka." It is located about half a mile west of the Idahoan, and there appears to be no doubt but that it is on the same ledge as the Idahoan.

MONTANA.

MOULTON.—Butte *Miner*, July 12: The sinking of the main shaft of the Moultou mine, at 400 ft deep, is suspended for 5 or 6 days, and until the cutting out of the station at the 400 level is completed. When sinking is again commenced the Ingersoll drill will be used in the bottom of the shaft, which will expedite the dropping of the shaft. At the 200 level a 9-ft vein has been opened.

THE ALICE.—The upper levels of the Alice mine are yielding their quota of ore very regularly, with no new developments to note in those levels. Much of the ore daily crushed in the Alice mills is taken from the 500, 000 and 700 levels.

LEXINGTON.—The sinking machinery at the main shaft of the Lexington mine is in excellent working order now, and the shaft is going down with a fair rate of speed. Saturday the shaft had reached a depth of 170 ft, with the rock in the bottom comparatively soft. Work at the old incline shaft, which produces the ore that keeps the Davis 10-stamp mill running, proceeds with the same regularity that it has for several months past.

MAGNA CHARTA.—At the Magna Charta mine the old workings are looking well and the ore coming out is fully up to the standard of the mine. The new hoist-house is about completed, and the foundation for the Howland pulverizer is nearing completion. In excavating for the building for the pulverizer, a large vein of quartz was struck. Some of the ore taken from this vein assayed well, showing as high as $150 to the ton.

NEW MEXICO.

LOTS OF NUGGETS.—*News* and *Press*: Col. Bergmann, in his three clean-ups this year of his placer claims on Ute creek, has taken out over 90 nuggets, varying from $5 to $100 in value, besides about 200 ozs of dust.

COPPER EXCITEMENT.—The miners about Ute creek are just waking up to the value of the copper veins in "Old Baldy." The prospect of the transfer to a Nashville company of the Mayflower, Monarch and Pullman lodes has created some excitement, and we hear of several new copper discoveries on both sides of Baldy. Some of the specimens are very beautiful and give promise of rich mines.

THE TAOS DISTRICT.—We have received no letter from this camp this week, but we hear indirectly of many new discoveries and the enlargement of the district. The camp is yet so new that the few prospectors there have not been able to take up all the prospects yet, and consequently have little time for development work. There is a prospect of an assayer being located there, which will prove a great convenience to the boys.

THE CIMARRON CO.—This company, which is operating the Rebel Chief mine in the Ute Creek district, have just had the misfortune to break their Howland pulverizer, one of the mullers having torn through the cast-iron side. From their experience with the Howland pulverizer we are not favorably impressed with it. At first they attempted to put the quicksilver in the pulverizer as is claimed by the manufacturers to be successful. The mercury floured and nothing could be done in that way. The riffles and sluices alone would not save the gold, so they were obliged to put in dollytubs. These delays and changes have seriously interfered with their work. Before the break they had run about 250 tons in the 25 days of operation. We understand that the clean-up was satisfactory, but there is some talk of substituting a stamp mill for the pulverizer, which, although grinding the ore well, does not save the gold. The Rebel Chief has about 1,500 tons of ore on the dump, and we shall be glad to see work resumed.

A California Beet Sugar Factory.

The successful manufacture of beet sugar in California has attracted much attention from those who are promoting experiments in beet sugar making at the East. The factory at Alvarado, Alameda county, is the establishment which is winning the State a reputation in this respect.

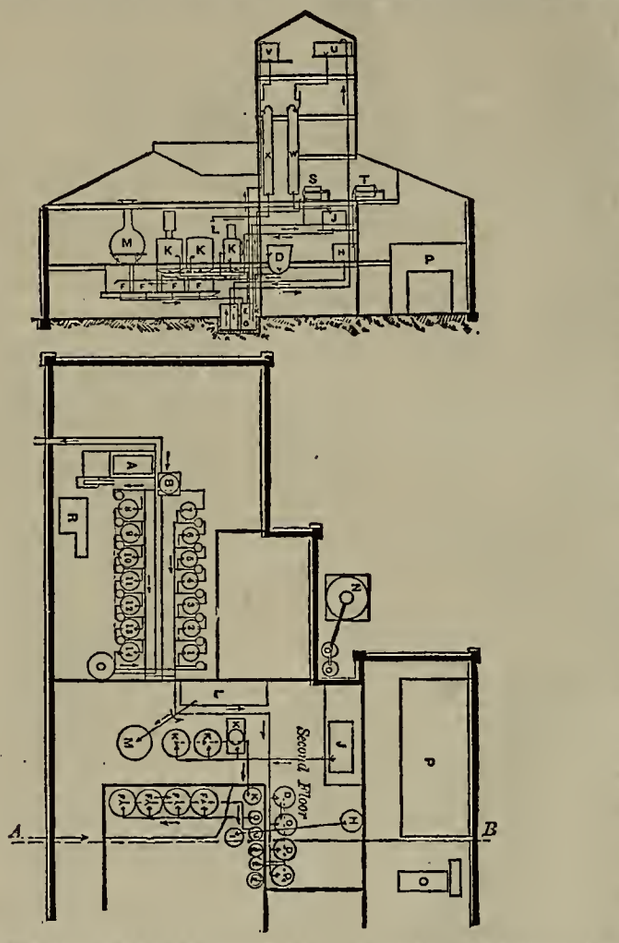
We find in *The Sugar Beet*, a Philadelphia quarterly devoted to the beet sugar industry, an engraving showing a section of the elevation of the Alvarado factory, and the ground plan of the same. The engraving is accompanied by a description of the progress of the juice from the heet to the sugar box. As this is of interest as showing one of the newer industries of our State, and as it will also give the general reader some idea of the process of beet sugar making, and the means employed, we shall reproduce from *The Sugar Beet*, the engraving and leading points in the description.

Some years ago the Alvarado factory was started under bad management and failed. Later, it was completely reorganized, and in 1879 was owned by the Standard Sugar Manufacturing Company, from which time excellent sugar has been made. This factory is situated on the Alameda Creek at Alvarado, and has connection with a siding about a half mile in length of the South Pacific Railroad. The buildings cover an acre of ground, but about thirty acres are used for various purposes. The main building is 80x250 feet, several stories in hight, and surmounted by a tower seventy-five feet high.

The beets that arrive in the factory are thrown into the washer, *A*, which is 8½ ft. long, 4 ft. diameter; capacity, 100 tons in 24 hours. The dirty water and all the debris from the beets is discharged into a sewer, into which all the condensed water of the factory is collected, and is carried by a flume on to the adjoining lands belonging to the company (see plan). From the washer the beets are carried upon a moving apron 27 ft. long, to the floor above, when they are thrown into the slicer, *B*, that makes 160 revolutions per minute. It has eight plates (16 blades or knives). The knives are changed only once in 24 hours, as a general rule. No stones are ever found in the beets. It will cut from 100 to 150 tons a day. The resulting cossettes pass into small two-wheeled wagons that hold about 300 lbs., and run on the floor; these may be placed in proximity to one of the cylinders of the diffusion battery. Fourteen of the latter are in the series, and are in two lines of seven each. Their dimensions are 4x6 ft., and have between them a heater. The battery is made to work from right to left in the order in which the cylinders are numbered. The water for supplying the battery has a fall of 60 ft. Before commencing, it is necessary to have a supply of heated water. For this purpose any three cylinders and their heaters may be taken, provided they lay immediately behind the first cylinder to be used to diffuse the beets.

Now, desiring to make the first diffusion in No. 1, we will fill Nos. 12, 13 and 14, which communicate with each other, with water raised to 60° or 65° C., as it passes through the heater attached to these cylinders or tanks. Then, a connection is made with No. 1 filled with sliced beets, the water passes from tank 14 through heater No. 1 at a temperature from 60° to 65° C., into tank No. 1. The pressure of the water-supply forces the water from No. 13 into No. 14, which we have just emptied, and fills No. 12 with cold water; thus the hot water is kept in advance of the cold, and is forced around the battery in the circuit as it is required. The water may be heated in the first instance in the heater of the tank which is to diffuse the beets, but this would take too long; so a supply is heated at first, and passed around as we have indicated above. When tank No. 1 is full of water of the required temperature, close the top cover and open air valve at top, and allow all the air to escape, then let it remain 15 minutes with full pressure of water. Now connect tank No. 2 (this has previously been filled with sliced beets) with No. 1, and pass the juice into the former, keeping the temperature from 60° to 65° C., as it passes through heater No. 2 in its course (tank No. 1 is again filled through pressure with the warm water from No. 14, and 14 from 13, and so on). When tank No. 2 is full of juice, close top and open air valve as in No. 1, then allow it to stand under full pressure of water 15 minutes; then open the valve and pass the juice by pressure through heater No. 3 to tank No. 3, with temperature as before from 60° to 65°; now close the tank and proceed as in case of Nos. 1 and 2. After the juice has stood in No. 3 15 minutes, if it has a sufficient degree of strength—say, 10° to 12°, about 300 gallons are drawn off, or a little more than enough to fill one tank with water; when the beets are in, this juice is sent to the defecating tanks. Should the juice not yet be of sufficient strength, it should be passed into No. 4, and stand for 15 minutes longer. After having drawn the quantity of juice indicated from No 3, connect tank No. 4 with No. 3, keeping the juice at the proper temperature as it passes through the heaters, Nos. 2, 3 and 4; now allow No. 1 to gradually cool as the cold water passes through it. After No. 4 has stood 15 minutes, draw for it 300 gallons, as in case No. 3; then connect tanks Nos. 4 and 5, keeping the water at the proper temperature, as it passes through heaters Nos. 3, 4 and 5. Continue in this manner to draw off the juice every 15 minutes after filling, and open the connection with the succeeding tank, the pressure of the water advancing the strongest juice from tank to tank as they are opened, and so continue until all the tanks are full; then as fresh ranks are needed, shut the water supply from No. 1, and put No. 2 in communication with No. 14. The tank No. 1 is then emptied, which operation requires but five minutes; it is then cleaned, and five minutes are required to fill it with fresh cossettes. Three cylinders are out of the series at a time. The capacity of the cylinders of the battery is 2,400 lbs., and 100 tons may be diffused in 24 hours.

C is a tank that holds the waste water from the machines throughout the factory. When this overflows, it carries with it the refuse pulp which unfortunately, as we have said, has not as yet had any application, but it was thought that in 1881 it would be purchased by the farmers. From the battery the juice passes into the first defecation tanks, *D* (have for dimensions 5′ 6″ in diameter, and 4′ 6″ in hight), and marke 6° Baume. There are four of these, and 2% of lime is added. The carbonic acid from the lime kiln (*N*) that has previously passed through the washers, *Oo*, is brought into contact with the defecated juice for about 18 to 20 minutes; the total is heated by a steam jacket. The juice, on leaving *D*, falls into the montjus (capacity, 300 gallons), *E*, and is forced through to the filter presses, *S*, at 6 lbs. pressure to



SECTION OF ELEVATION AND GROUND PLAN OF ALVARADO BEET SUGARIE.

square inch (see section). There are five of these, which are of a German design and have 18 compartments. From there the juice runs into the second defecation tanks, *F*, four in number; these are of the same size as those of first defecation, heated by a steam coil; a small quantity of lime is then added, after which the juice flows into the montjus (same dimensions as *E*), *G*, and is forced through it into the second filter presses (same as *F*), *T*. The juice then collects into the tanks (capacity, 400 gallons), *H*, and is drawn into a montjus, *I* (there are two of these, each having a capacity of 400 gallons); the juice is then forced into the receiving tank, *U*, which is on the top of the tower. The object of having this at such a hight is to obtain an easy flow of juice through the (6) bone filters, *W;* these are 20 ft. high and 30 inches diameter, hold 98 cubic feet of juice; the bone-black is rehurned every 12 hours. The juice, after leaving these, flows into a tank, *J;* there are two of these, having each a capacity of 1,122 gallons; from these into the double effect, *K;* the juice marks 4° to 5° *B.* upon entering, and 25° when leaving. The vacuum pump that communicates with this double effect is attached to a walking-beam engine of 50 horse power (this engine also drives several other pumps; of these we may mention a Cameron pump for the vacuum pan). The juice then is run into a montjus of 300 gallons capacity; then into tank, *V*, capacity 600 gallons, placed at the top of tower; from this latter, it passes into six thick juice bone filters (*X*) of the same design as the first—the juice marks 25° upon entering, and 23° to 24° upon leaving; then into the tank *L* (two of these of 1,000 galls. capacity each); then into the vacuum pan *M*. The working of the bone-black is, in some respects, rather original; as the superintendent has invented a cylindrical washing-machine that can wash 18 to 20 tons in 24 hours, rejecting a German apparatus that had the same functions. This machine is said to work well, but before passing into it, the bone-black is fermented on the ground floor in vats; when the washing is completed, it is subsequently raised to the bone-kiln *P*—which is capable of burning 10 tons in 24 hours, requiring five men—by a moving apron 20 ft. long; after being thoroughly burned it is hoisted to the top of the tower and allowed to fall by a chute into the filters. Thirty barrels of sugar may be boiled at a strike in the vacuum pan; and after the strike is complete, the granulated mass is taken into the tanks by elevator to the fourth floor. After the proper crystallization is complete, it is thrown into the mixer and from there into the centrifugals (these have a velocity of 1,000 revolutions per minute, and are 30 inches in diameter and inches in hight); the sugar, when taken from these, is carried up to the second floor to the packing-room.

The above gives our readers a general idea of the working of the juice. Upon the grounds are the buildings, blacksmith-shops, store-houses, etc., which are most useful. The water for the factory is supplied from two artesian wells that have the respective depths of 212 and 270 ft. The boilers of the establishment are placed in a special building known as the boiler-house, which consume about 20 tons of coal a day, furnishing sufficient steam to run a 30-horse power slide-valve horizontal engine, and 40-horse power beam engine with eight pumps attached, and 20-horse power Cameron vacuum pump. There are six boilers altogether; two of these are 15 ft. long, while four are 14 ft. in length. Of the pumps throughout the establishment, there are no less than 23.

How Diseases are Propagated.—The assertion is made by Prof. Tyndall that diseases are propagated, not by effluvia or sewer gas, but by solid particles discharged into the atmosphere by currents of air or gas. This conclusion he was led to by the following experiment: He cut up a piece of steak steeped in water, heated it at a little above the temperature of the blood, then strained off the liquid; in a short time this fluid became turbid, and when examined through the microscope was found to be swarming with living organisms. By the application of heat these were killed, and when the solution was filtered he obtained a perfectly pure liquid, which, if kept free from particles of dust, would remain pure for an unlimited period; but if a fly were to dip its leg in fluid containing living organisms, and then into the pure liquid, the whole would be swarming with animalcules in 48 hours.

There is no malady or sickness more severe than not to be content with one's lot.

The Chautauqua Session at Monterey.

Two years ago the various Chautauqua Circles of California, organized an assembly at Ocean Grove, Monterey, as a branch of the famous Chautauqua Assembly, which for several years has attracted considerable attention in the Eastern States, and which is doing much to add interest to and popularize the study of science and literature there. The objects of this association are as follows:

First.—To encourage the organization of local circles for the study of such works as may from time to time be agreed upon, and have the benefit of mutual aid in considering each week the subjects read or studied. Men and women of ordinary abilities and education are encouraged to take part, and find it at once a source of interest, profit and pleasure.

Second—To provide a suitable course of summer lectures, where professional men and women, together with intellectually inclined persons of all ranks, can find both recreation and profit. This course of lectures will be given at Monterey, in connection with the meeting of all members of the circles as far as they can be present.

Third—To make collections of plants, shells, charts, interesting papers on various subjects, and curiosities of all sorts, and to arrange them in a proper form for reference and study.

To aid in this work, the proprietors of the Grove have erected a large and commodious assembly room, to which has been added two smaller and convenient rooms, as laboratory and working, or committee-rooms—to which will also be added a suitable museum building as soon as the collections may require such additional space.

The third annual session of the association was brought to a close on Monday last, after a continuance of two weeks, and is pronounced by those who have been present at all as the most interesting and fullest attended of the series. Lectures of an able and instructive character were given on various scientific and general subjects, among which were included astronomy, microscopy, biology, botany, entomology, physiology, conchology, etc. Among the lecturers may be enumerated Prof. Moses of the State University; Profs. Norton and Moore of the State Normal School; President Stratton of the University of the Pacific; Dr. J. H. Wythe of the Pacific Medical College; Miss Norton and Miss Washburn of the State Normal School; Mrs. Field of San Jose; Rev. C. V. Anthony of this city; Mr. F. B. Perkins of the San Francisco Free Library; Prof. Lemmon and Mrs. Lemmon, the well-known California botanists, and others.

The lectures averaged about three each day and were largely attended, not only by the members of the Association, but by large numbers who are constantly visiting this popular place of resort. In addition to the lectures, classes are also formed for practical instruction in the field, in botany, geology, etc., which are lead by thorough and competent instructors. We have no space in our columns to-day, to make special reference to any of these lectures, but may possibly allude to some one or more of them in future issues.

This Association has now put on the appearance of a permanent institution, as a summer school of science, and one that is likely to exert a great and growing influence on the growth of learning and social improvement throughout the State.

Extensive Prospecting Expedition.

We had in the early part of the week, the pleasure of a visit from Mr. Green Finnel, who took in Challis during a wide prospecting trip, which he is still pursuing with three companions. The party started from Salmon city early in May and passing over to the Montana side of the Rocky mountains, prospecting along to the eastward for a distance of some 80 miles, when they recrossed the mountains into Idaho and searched the country between the Medicine Lodge and Birch creeks. He describes the rocks of this region as greatly diversified, consisting of quartzite, lime, slate and porphyry. He pronounces the country very similar to that about Bay Horse and Kinnikinnic. The ores brought in, contain evidences of copper, and seem to be of the character known as copper silver glance. Others exhibited, evidently contain quantities of iron; but as none of them were assayed, we are unable to speak of their value. After leaving the ranges east of Birch creek, they crossed and gave the divide between that stream and Little Lost river a pretty thorough examination. The country formation here is described as being composed much the same as that on the east of Birch creek but with less porphyry. From this place the party left for the mining section on the head of the Pah-Simari.

We believe that a mixed formation, of varied rocks, is generally regarded by prospectors as favorable to the existence of mineral lodes and presume that others, following into this region, will make additional discoveries.—*Challis (Idaho) Messenger.*

Tides of Electricity.—Mr. Alex. Adams, one of the officers of the British Post-office Telegraph Department, has discovered the existence of electric tides in telegraph circuits. By long continued and careful observations he has determined distinct variations of strength in those earth currents, which are invariably present on all telegraph wires, following the different diurnal positions of the moon with respect to the earth.

The Engineer.

The Corinthian Canal.

French enterprise promises to undertake the accomplishment of a third great engineering feat in cutting a canal through the Isthmus of Corinth, which both in ancient and modern times, has formed an obstacle in the way of commerce between the Adriatic and the Ægean. General Turr, a well-known French geographer, has received a concession from the Greek government to carry out this design, and M. de Lesseps has promised such assistance as can be spared by one whose attention is monopolized by the more difficult and extensive scheme of Panama. When it is remembered how obvious the improvement effected by such a canal must at all ages have been to those enterprising peoples whose direct concern has been and still is the trade between the Adriatic and the Ægean and Black Seas, the only matter of surprise is that the operation has been so long deferred.

When the power of Corinth was at its prime, it was the one drawback to its happiness, the single element of weakness in its prosperity, that it was compelled to have two separate harbors—one for the Gulf and the other for the Ægean. With the view of mitigating, as far as possible, the inconveniences that arose from this circumstance, the Corinthians constructed across the isthmus a polished roadway, over which vessels could easily be hauled, and, from the purpose with which it was built, it was called the Diolcos After Corinth was destroyed by the Roman General Mummius (B.C. 145), and restored by Julius Cæsar, the Emperor Nero bestowed some notice on the once favored city, and devoted his attention to the question of cutting a canal through the isthmus. The ruins of the works which he caused to be erected are still shown.

It is said that Nero wished himself to strike the first blow, or as we should now say, lay the foundation stone; but a mutiny detained him in Rome. The work then languished, and either want of money, as reference to Suetonius would suggest, or the difficulty of piercing the hard rock led to the abandonment of the design. The Emperor Justinian, who was imitated at later periods by the Eastern Emperor Emanual, and also by the Venetians, erected fortifications across the isthmus, but no one attempted to renew Nero's abandoned canal. The fortifications did not avail to protect Corinth against either the Herulians or the Goths, whereas the canal would have added greatly to the welfare of that city and of the neighboring peoples. It is appropriate and auspicious that the formation of a modern Kingdom of Hellas should be so speedily followed by an attempt to perform one of the few tasks neglected by antiquity. With the cutting of a canal through the isthmus, more will have been done to restore the prosperity of Corinth than has been even so much as attempted since the age of the Cæsars.

The Water-way from the Lakes to the Mississippi.—A meeting will be held at Davenport, Iowa, July 25th, under the auspices of the Illinois and Mississippi River and Canal Improvement Commission, to consider and discuss the subject of a ship canal from somewhere near Chicago to a convenient point on the Mississippi river. It is not a wholly new scheme—about 20 years ago a grand national meeting was held in Chicago in this same interest, which was fully attended by competent delegates from all parts of the country. In the list of the probable attendants at the coming meeting are the names of many influential and well-known Western business men and politicians. The agricultural societies of many of the States will also be represented, as well as State Granges and like organizations.

Canal from the Black to the Caspian Seas.—The Russian engineers are renewing the project of a canal between the Black and Caspian seas, an idea which was formed in the times of "hoar antiquity." Plans for making a connection between the Volga and the Don were drawn up in the reign of Sultan Selim, and are preserved yet—somewhere. The great mass of water in the river Terek attracted the attention of M. Daniloff, the Russian engineer, owing to the great hight of the river, nearly 500 ft. above the level of the Black sea. The volume of water is from 175 to 554 cubic meters per second. Four branches will complete the junction of the Azof and the Caspian, and the Don and the Volga.

The Brooklyn Bridge.—At a recent meeting of the East River Bridge Commissioners, the President, Mr. Murphy, stated that the great structure would be finished within a year. The sum of $1,000,000 is required to complete the work, of which Brooklyn is to furnish two-thirds and New York one-third. The financial statement showed that on May 31st last, $13,009,315.20 had been received, and $12,884,437.23 expended since the work began, and there was $124,877.97 cash on hand, and liabilities of $85,155.08 outstanding.

The Denver and Rio Grande railway company are rushing their work in Colorado as well as in Utah. They have contracted for the grading of their short line from a point on the main line 17 miles south of Denver, to the South Fork of the Platte, on a water grade.

Useful Information.

Feather Cloth—How Made.

We have already, in these columns, alluded to the fact that a new and beautiful fabric has recently been introduced, made chiefly from feathers. The following from the *Textile Manufacturer*, tells us how it is made: The manufacture of feather cloth is not difficult, and the machines used in an ordinary woolen mill are suitable for the purpose with but slight modifications. When the down has been pulled off the feathers it is ready to be mixed with any textile material, such as cotton, silk, or wool, but the latter is the most suitable on account of its softness. Down may even be spun by itself, but this is seldom done. The mixture most to be recommended is 70 lbs. to 80 lbs. down, 100 lbs. to 120 lbs. skein, wool 40 lbs. to 60 lbs. To unite these three they are placed in alternate layers upon each other on a floor, and are then passed through a cock heel willy, making 400 to 500 turns per minute, and then brought to the scribbler. The main cylinder of this engine should run only about 35 to 45 revolutions per minute, instead of 100 to 110 as with pure wool. All rollers, clearers and doffer must be speeded in proportion. India rubber clothing is the best for this work, and must not be too fine, while the rollers should be set pretty close. When passing out of the scribbler the mixture is allowed to fall on the floor, and removed by a girl to the carding engine. In doing this the attendant examines the mixture a little to remove any whole feathers which may have passed.

The carding engine runs at the same speed as the scribbler, and is, in other respects, like it. The mixture does, however, not fall on the floor, but it passed on a sheet of cotton cloth, which is rolled up behind the engine, and rolls up the lap coming from it, so that the latter remains perfectly separated, and cannot be compressed.

A Substitute for Doors.—A new substitute for doors—hanging curtains—seems to be rapidly coming into vogue in New York, which is described as follows: This contrivance is more and more displacing doors in New York residences. Take down the door, and across the top of the doorway place a rod of wood. Black walnut or oak is best for the purpose, and there should be a knob at each end. The curtain is suspended by rings, which slide on the rod. Wooden rings are most fashionable, but metal will do, though noiser. Let the curtain be long enough to escape the floor by four or five inches, but fill out this space with a heavy upholstery fringe, sewed on the bottom. In that way you will have a good circulation of air, while the weight of the fringe, will keep the curtain from blowing out too fully for purposes of privacy. The curtain may be of medium light weight, but it should be either lined or doubled; also decorated with embroidery or bands of material contrasting in color with that of the curtain itself; or it may be adorned with both hands and embroidery. You can, if so disposed, put on other decorations in the form of embroidered sunflowers, cat-tail grasses, club ruches, poppies, palms, or any other device that you may choose. You may even aspire successfully to a pair of long-legged cranes. The cost of cotton plush, imitation tapestry, and two strips of cloth will be about $10 for a double doorway of ordinary size. Plain canton flannel would reduce the expense to half that. An entrance-way of this description dresses a room wonderfully.

Greek Honey.—The most celebrated honey of Greece is the Hymettian honey, also called Thymari honey, because it has the flavor of thyme, which grows plentifully upon and about Mount Hymettus in Attica, south of Athens. This honey was already celebrated in classic times, and has preserved its reputation to the present day. It is exported to England in tin cans. The common kind of honey is called Riki (from Erica), because domestic species of Eriea happen to be very common in localities where bee-culture is carried on, and their flowers are a great attraction to bees. Upon the island of Euboea, in mountain glens, near Karysto, there existed in former times large tracts covered with wild-growing roses and blackberries. The honey obtained from bees feeding upon the flowers of these plants had a peculiar and distinct odor of roses, and was known as rose-honey. But since those plants have been eradicated this kind of honey has ceased to exist. Honey is usually put up in goatskins and sold at the rate of about 20 cents the okka; in good years even for less.—*New Rem.*

Silvering Mixture.—A German scientific journal furnishes the following process for the instantaneous coating of copper or brass objects with silver without difficulty: Mix 3 parts of chloride of silver with 20 parts of powdered cream of tartar and 15 parts of powdered common salt. Moisten a suitable quantity of the mixture with water, and rub it with a piece of blotting paper upon the metallic object, which must be thoroughly clean. The latter is afterward rubbed with a piece of cotton upon which precipitated chalk is dusted, then washed with water and polished with a dry cloth.

There is a genuine mistletoe on a pear tree in the orchard of Robert Fulkerson, near Santa Rosa—something that is believed to be without precedent heretofore.

A Simple Method for Toughening Glass, says a Leipsic paper, is to place the article in a suitable iron pot, which is then to be filled with cold water, enough common salt being added to form a saturated solution. The whole should next be gradually raised to the boiling point and kept there for at least 20 minutes; the pot and contents may then be taken off the fire, etc., and allowed to cool down very slowly—preferably by burying in sand. When the articles are eventually taken and cleaned it will be found that they will resist blows and changes of temperature far better than they did previously.

Glass Weaving, according to report, seems to be gradually working its way into practical value. We have, from time to time, for several years, heard of experimental efforts in the production of articles of dress or domestic use from woven glass, but now we read that a Pittsburg firm is manufacturing fabrics that are strong, cannot be ripped or torn, and are cheaper than those woven from linen, cotton or silk. A large tablecloth of variegated colors, with ornamental borders and fringed edges, is on exhibition in New York city, which can be washed and ironed like the ordinary articles.

To Remove Mortar Stains from Bricks.—Bricklayers make use of spirits of turpentine, and also of vinegar, for the purpose of removing mortar stains from pressed brick fronts, the materials being carefully applied with a sponge or rag. Any acid, applied in the above manner, in very dilute form, would answer the purpose. Vinegar being a very dilute acetic acid, is probably as good a recipe as can be given.

To Clean Preserve Jars.—Sweetmeat jars or bottles may be cleaned without scraping them, by pouring into the jars hot water and a teaspoonful or two of pearlash. The contents which remain sticking to the sides and bottom of the jar will be disengaged by the pearlash and float loose in the water.

Hard or Soft Water.—To ascertain if water is hard or soft, procure a small quantity of soap dissolved in alcohol, and let a few drops of it fall into a glass of the water to be tried; if the water becomes milky it is hard; but if little or no milkiness results, the water may be said to be soft.

Good Health.

Starvation by Cookery.

[Written for the Press by Sanitas.]

Starvation by cookery is, I believe, chiefly a modern sin, and less the fault of the cook than of the public. Cooking is for man a necessity and quite a saving of vital energy. For, were it not for the cook, it would take so long for us to digest our food, that, like the cattle, we should have to spend half our time in eating, and the other half in resting that we might digest it. But while our best and our daily thanks are due the cook, it is high time that he or she give up kitchen hypocrisy, and send no more to our tables things having the appearance, but lacking the reality of food. I wonder how many die of hypocritical cooking? Perhaps half of us; for while gluttony and other sins cause much disease, yet were our food real, we might the better resist their temptations and suffer less by transgression.

But we must hurry up and not keep the cook in suspense as to the charge against him, which is briefly this: that he or she removes the natural salts from our food, and hides the loss by common salt, which, far from replacing them, rather aggravates the vital failure that comes from saline starvation. Not that common salt is bad of itself; it, too, has its uses in food.

Whilst this spoliation of food has been frequently complained of, and protest made against it by health reformers, it is only of late years that pointed evidence of the nature and extent of the danger has come to light. Degeneration of various tissues and organs in the body has long been recognized as the source of nearly all chronic disease and the fertile cause of that lack of stamina or endurance that characterizes modern life. Those in whom there is much degeneration, say the kidneys or the liver must walk through life gently; like a shoddy garment, they are safe enough for *careful* wear, but sure to give way under any strain.

The causes of the various types of degeneration have hitherto been very obscure, but one type has proved, on analysis, to be simply such tissue as the body can make in the absence of potassium and phosphates. This discovery of Dr. Dickinson's, of de-alkalized fibrine, as he calls it, is a startling one. This tissue has an excess of common salt; but, as compared with the natural tissue, which it has replaced, it is exceedingly poor in just those food salts which our cook does not send up to our tables. Every tissue in the body has a certain length of existence, after which it dies and is replaced. But this only slowly and cell by cell, fiber by fiber. To make each tissue capable of all the various services demanded of it, requires not only nitrogenous and carbonaceous foods, but also those saline elements that are so abundant in milk, vegetables and fruits. Sailors, it is well known, cannot undertake a long voyage without a daily supply of lemon juice or preserved vegetables, otherwise the terrible scurvy will disable or kill them. Scurvy is the acute disease due to this saline-starvation; whilst waxy degeneration is the chronic disease due to a less violent and more prolonged starvation from the same elements.

It is estimated that man requires 40 grains daily of potassium oxide to carry on the nutrition and health of the body; but few of the working classes in our large cities get more than 25 to 30 grains per day. For instance, white bread, of which many consume a pound daily, furnishes only 7 grains of potassium, whereas the same amount of Graham or brown bread contains 25. Again, the salt pork, salt fish or ham which forms their staple meat, has lost most of the potassium to the brine, or will lose it (like salt fish) in the washing and steeping it undergoes before cooking.

Even the wealthier classes, with all their abundance, have been, by our modern habits of food and cookery, reduced to about the minimum quantity of potassium, and every little strain, as well as every little error, hastens on the decline of life and the day of physiological fatigue. Potatoes are rich in potash, but should our cook first peel and steep them in cold water to whiten them before boiling, we are cheated in every 8 ounces we eat of 9 grains of potash; for boiled in their skins, 20 grains, instead of 11, would have come to table. Should we partake of cabbage the loss is still greater, because the leafy vegetable presents such an extended surface to the water. Again, corn-starch pudding is also an emasculated food, all the potash, nitrogenous and tissue-building matters having been removed in the manufacture, leaving pure starch, the most deceitful of all foods.

These losses of potash are small, but so numerous, repeated and constant that the poor body is often at its wits' end to replace the cells and fibers of each tissue as the old cells die out. So, cell by cell, fiber by fiber, our livers and blood vessels are rebuilt of shoddy—of de-alkalized fibrine—a substance that, while able to keep up the form and movements of the liver, is totally unable to perform its functions of digestion and of blood depuration. So we are slowly crippled in our vital power, and especially in our ability to endure fatigue and to recover from disease or other unusual strain. At the same time our blood is imperfectly purified; it circulates imperfectly digested food and effete matters that would have been expelled had our food been natural. These degraded matters irritate the brain, making us nervous and excitable; they weary the muscles, making us easily fatigued, and they render us more liable to rheumatic and inflammatory diseases.

Dentists, too, have attributed to this spoliation of food the toothlessness of this generation. White bread and corn-starch were not common foods to our ancestors. And 50 years ago, vegetables were more commonly cooked in soups or broths, which gave us all the good they contain.

But not every person suffers equally from this waste of food salines. Out of 100 sailors on board a scurvy-stricken ship, 10 or 20 may escape the worst features of the disease. The causes of such individual peculiarities are beyond our skill. Why, out of 20 equally exposed to the contagion of small-pox only 15 should take the disease, is a mystery. Or, why again, in a family, where, as regards heredity, habits and food, all the children are equal, why should one or two escape, whilst the majority suffer from an epidemic of scarlet fever? Echo answers, why?

Those, then, who desire that they and their children should walk this world in no shoddy suits of flesh and blood, should inherit no sham teeth, no feeble livers and no languid limbs, must, in two respects at least, return to the ways of their fathers. First, Graham bread must entirely replace white bread; and secondly, soups rich in vegetables must be freely used. Clear soups are, of course, inferior, but still there is less waste in rejecting the boiled vegetable itself, than in rejecting the clear soup it was boiled in. Potatoes, beans and peas form a good basis for soups, being all rich in potash as well as in the more solid constituents of food.

Physicians, especially in the army, are well aware of the wonderful power of potassium salts to remove fatigue and exhaustion, and frequently, on a march, serve out a ration of special soup or Liebig's extract of meat for this quality of their potassium salts.

Santa Rosa, Cal.

Causes of Pimples.—Pimples are occasioned by the torpid state of the skin, or, in other words, by the inability of the skin to perform its proper functions. The cause of these pimples is, therefore, neither more nor less than an obstruction of the pores of the skin; the perspiration being allowed to accumulate, the mouths of the pores become clogged, irritation ensues and a pimple arises. The only way to be rid of them is to allow the skin to do its own work by preserving it in a healthy condition and keeping the system in good order. The following ointment is recommended: Take an ounce of barley meal (the finer the better), one ounce of powdered bitter almonds and a sufficient quantity of honey to make them into a smooth paste. If you are taking medicine for the blood adopt our advice and place yourself in the hands of a competent physician.

Go to a Doctor.—A correspondent asks us to prescribe in an extreme case of chronic catarrh. We cannot assure the responsibility, and notwithstanding you have had much experience in that direction, we would still say—consult some good physician.

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Well Augers—Loomis & Nyman, Tiffin, Ohio.
Tonite Powder Company, S. F.

Passing Events.

This week has been rather an eventless one from a miner's point of view. While steady work is going on in all quarters of the coast, the hydraulic mining regions of this State are at a standstill, owing to the unfortunate litigation, and the existing injunction against the hydraulic miners. The companies in Nevada county have petitioned the Board of Supervisors to reduce their assessments 66⅔%, and testimony adduced shows that the depreciation is even greater than that. The assessment of the county will be reduced from $9,000,000 to $,5-000,000.

As an evidence of the advance of quartz mining interests, our foundries are busy on mining machinery, and are shipping more or less all the time. A noticeable feature is the coming to the front of localities where lead and copper predominate, such as at Wood River, Idaho, and some parts of Arizona. The experience of Eureka with lead ores, and of such camps as Bisbee with copper, ought to be sufficient to show that there is great profit in this kind of mining. People who have sulphur mines ought to do well with them, as the product is scarce and in demand.

We bring to the attention of miners this week a means for the utilization of their sulphurets, and those who own sulphuret mines may now have a chance of realizing something out of their ore.

News from the Harrisburg mines, at Alaska, are to the effect that very little work has been done on the ledges, but the prospects look better than ever; the ledges showing up well and having every appearance of being solid and permanent placer mines. The Paris company shipped 95 ounces, and the Nady bullion company 60 ounces, being their clean-up since the last steamer. The hills are full of prospectors, many having gone far into the interior. New locations and discoveries have been made, but none of any great value.

As far as California is concerned, there are now more prospectors at work in the mountains of the southern part of the State, Mono, Inyo and San Bernardino counties, than elsewhere. Along the borders of the State line seems a favorite locality just now.

Utilization of Sulphurets.

A recent visit to the new works of the Safety Nitro Co., at Pinole Point, San Francisco bay, developed some facts of interest to the mining community, in the matter of the utilization of sulphurets; and this, aside from the other subject of interest, a new and powerful explosive, to which we shall allude more fully on a future occasion.

This company have erected extensive works with all modern appliances, for the manufacture of sulphuric and nitric acid, which they carry on in connection with the manufacture of their powder. They now purchase what sulphur they can buy here, but are compelled to buy from Japan and elsewhere, owing to the scarcity of sulphur on this coast. For this sulphur they pay from $25 to $35 per ton. They intend, however, to utilize the sulphurets from the mines for the supply of sulphur, and have this week closed a contract for 1,000 tons. They stand ready to purchase sulphurets in quantity, paying for them in accordance with their value.

It will probably interest some miners to know exactly how these sulphurets are to be utilized, and to explain this it will be necessary to explain briefly the process of manufacture of acids at the works in question.

The grounds of the company are quite extensive, comprising some 320 acres, the various buildings being arranged at distances apart, in a manner to prevent accident, and also to begin with the crude material near the water, where the landing wharf is, and to pack the finished product near the railroad, whence it is shipped. The acid works are, therefore, near the water, on the north side of Pinole Point, the warehouse for the powder being nearly a mile away, the other side of the hill.

There are two or three acid works on this coast now, but this will be one of the greatest capacity when entirely finished.

A two-story building, 100 ft. long and 60 ft. wide, contains the furnaces and acid chambers. There are four furnaces leading into a large dome or sort of combustion chamber, into which the combustion of the sulphur is completed. It stands up some 15 ft., so as to allow a thorough mixture of air with the gas before it goes into the condensing chamber, thus facilitating the progress of the work, and preventing the sulphur from subliming, or precipitating, in the lead chamber. This also facilitates the formation of strong acid in the first chamber and economizes chamber room.

There are iron pans on the bottom of these four furnaces, into which the sulphur is placed and where it melts, since here the sulphurous acid is formed. Steam and nitric acid are needed to convert it into sulphuric acid. In order to accomplish this, round iron pots, filled with niter (and a little sulphuric acid to decompose said niter), are placed in the furnace, and the heat of the burning sulphur distils off nitric acid, which decomposes into nitrous acid, and passes over into the lead chamber with the sulphurous acid, where it becomes nitric acid again. Steam from the boilers is admitted into the lead chambers.

There are two large chambers, each quite high and 63 ft. long by 20 wide, formed entirely of large sheets of lead melted together at the edges by means of a mechanical blowpipe. There are several tons of lead in this chamber supplied by the Selby Lead company of this city. In the bottom of each chamber is a certain amount of water, and the moisture in the chamber and the presence of the nitrous fumes together convert the sulphurous fumes into sulphuric acid.

It takes about two weeks to fill the two chambers with acid, and the daily capacity of the works is from 10,000 to 12,000 lbs. of acid per day.

Those gases which are not condensed in the first lead chamber, are taken into the second, where a further condensation takes place. There is also still another chamber, in the form of a large pipe, 75 ft. long, which further economizes the process.

The fumes that pass off here go up a stack or chimney 70 ft. high. There is scarcely anything passes out of it, slight white fume alone showing that a residue passes over. Being near the water the prevailing winds blow what little there is into the bay.

The sulphuric acid is drawn off by pipes into another furnace, while still hot. This furnace is built lower than the chambers (which are in an upper story) and is in another building near by. A steady stream of acid runs from the chambers through this furnace, and here it gets its first condensation. The furnace is covered with two coats of lead, one three-quarters and the other one-half inch thick. The acid flows in a sheet down this, and the flame of the furnace passes up over it in the opposite direction.

From here the acid flows on into a pan on top of the concentrating range in the concentrating house. In this house, which is about 24x60, are the retort furnaces, with 12 large glass retorts, each with a capacity of two carboys of about 300 lbs. each. In the pan on top the acid is kept hot with the waste heat from the retort furnaces, and is drawn hot into the retorts and boiled day and night until it is fully concentrated. It is brought to 66° Beaume, which is pure sulphuric acid.

From the retorts it runs by pipe to another house where nitric acid is made. To do this the acid is drawn on to niter in iron retorts and a fire built; the fumes of the mixture, condensed, form nitric acid. The sulphuric acid alone is drawn from the glass retorts, cooled, and put into carboys for shipment.

This in brief is the manufacture of sulphuric and nitric acid. This company use a large amount of nitric acid in manufacturing nitroglycerine for their powder. The consumption of acid on this coast is very large, and is increasing. This increase is due partly to the greatly increased consumption of powder; to the increase of export; and also to the fact that many chemical manufactures have of late started up which we never had here before.

Now the most important feature of this whole matter to the miner is the fact that he can utilize his sulphurets. There are thousands and thousands of tons of these troublesome little minerals, lying on the dumps of various mines about the country. Miners have been waiting for a process to work them cheaply, but in default of this apparently impossible thing, it behooves them to utilize them in the next best way—sell to some one who can use them.

In using the sulphurets for the manufacture of acid, the Safety Nitro Co. get the sulphur and use that, and also get a portion of the precious contents. This helps them and helps the miner too. They sell the powder to the miners and buy their sulphurets in return. The only difficulty so far has been they have not been able to get a sufficient supply, that is the sulphurets are not offered in sufficient quantities.

The company have acids for chlorination, and can utilize the residue after sulphurets are burned. By having the acid and no freight to pay on it (which is very high), they can work the sulphurets that others cannot work.

Contribution to the Geology of California

New Series.—No. 3.

Coulterville to Chinese Camp.

H. G. HANKS STATE, MINERALOGIST: Leaving for the present a notice in detail of the mother vein, we follow its course approximately to Chinese Camp, near Sonora, in Tuolumne county.

First, however, let me correct a slight typographical error in "Contribution No. 2." For "cinnabar slates" therein mentioned read "similar slates." The error is the more confusing, from the fact that cinnabar is actually found in one of the quartz veins of that region, associated with gold, a somewhat rare occurrence.

Coulterville to Priest's.

Crossing the line of the great vein at Coulterville, the road leads for a short distance over an outcrop of the heavy greenstone conglomerate, bordering the slates on the west. From that point to Priest's hotel, on the Yosemite road, a distance of 10 miles, the rock formations are entirely different from those of the valley, being granite and eyenite. The hills rise higher and the topography changes. The altitude at Coulterville is about 1,700 ft., and the road, upon the granite formation, is about 2,500 ft. Priests is between 2,300 and 2,400 ft. in altitude. The hills are but sparsely timbered and generally are wholly covered by a dense growth of chemisal. When this is in blossom, it never fails to remind one of the heather-covered downs of England, although it is comparatively gigantic in growth.

These high hills, which have been generally regarded as barren and worthless, are now being sought for and utilized for grain-growing and vineyards. Wherever water can be distributed over the surface, the granitic soil yields excellent crops of wheat. The vine takes kindly also to this soil and particularly where there is an excess of iron oxide, giving a red color to the earth. Probably the greenstone conglomerate hills are better than the granite. It is said that wherever the vines get well started they do not afterward require irrigation. The fact that these hills can be covered with vineyards is extremely important as greatly extending the area of the vine-producing region of the State.

About midway between the points mentioned, the syenitic granite gives way for a short distance to a thin belt of gneissic rock and a metamorphic slate. These formations are bordered by felsites, which, in decomposing, have formed banks and layers of kaolin, cut through by the graded road.

Near Priest's some gold-bearing quartz seams, or veins, have been found traversing the granite. These probably hold about the same relation to the veins of the slate belt as the veins in the granite at West Point, farther north, do to the veins in the slates of Amador county.

Slates at Priest's.

At Priest's we pass upon another and heavier belt of slaty rocks, which are more massive, harder, and appear older than the jurassic slates of Coulterville. This formation extends east and southeast from this point, and is probably the same body of hard black slates reaching southeast to Hite's cove and beyond, carrying the celebrated Hite vein and others. These slates are regularly stratified, and appear to be traversed by dykes of trap or greenstone.

Moccasin Creek.

From Priest's to the Tuolumne river at Stephen's bar the road leads in a northwesterly direction. The granite and syenite appear to thin out, for directly after leaving Priest's the greenstone conglomerate takes its place. The road descends rapidly between high chemisal covered hills, underlaid by the conglomerates, to Culbertson's in the valley, only a mile west of Priest's, and some 1,300 ft. lower.

At this point we are again upon the mother lode formation, and follow it down Moccasin creek to the Tuolumne. Looking back toward Coulterville, the view is interrupted by the peak of Penyon Blanco, the crest of which is formed by the massive blocks of white quartz of the mother vein. About Culbertson's the vein is split up, and does not come boldly to the surface. Lower down the valley it appears in the foothills on the right bank, and on the left bank there are heavy outcrops of serpentine, extending nearly to the Tuolumne, where the slates are found largely developed. The month of Moccasin creek is only about 700 ft. above tide. Running parallel as it does with the great vein for several miles, it might be expected to be rich in gold, which was the fact. It has been worked and reworked with profit, but now the gravelly bed is being leveled, and vineyards and orchards cover its surface and give a perpetual bonanza to the appreciative sons of Italy. The wonder is that more of our American young men and women do not avail of the many opportunities to make charming and profitable homes in the forsaken gold fields of California.

Tuolumne River and Jacksonville.

We cross the river in a boat and follow the left bank for about two miles to Jacksonville, noted years ago for its figs and oranges. The general direction of the river corresponds with the strike of the formations but it soon turns abruptly to the west and cuts across the slates and sandstones of the chief gold belt. Conglomerates and outcrops of serpentine with traces of the mother lode are also found, and these rocks continue, with a regular northwest trend, to Chinese Camp, eight miles southeast of Sonora. This place is situated in an open, gently rolling country, at an altitude of about 1,300 ft. Surface gold washings were very extensive in this vicinity, and sustained a large population of miners for years, but the diggings are now overgrown with grass, and many of the once well-filled stores are vacant.

WM. P. BLAKE.

The Coming Fair.

In a very short time now the exhibition of the Mechanics' Institute will open in this city. Already nearly all the floor space has been applied for by intending exhibitors, so that the success of the exhibition is assured. As applications for space still continue to come in, however, it will be as well for those intending to exhibit to begin to utilize their space as soon as possible, or they may not have as much as they want, as space will soon be in demand.

Every year, when the last days come, everything is in a rush, and every one is in a hurry. Exhibitors are tumbling over one another in their haste to arrange their booths or stands. Among them are a few calm and contented ones who, taking time by the forelock, have arranged their exhibits before the grand rush. We should like to see this small and select crowd larger this year. And above all things, we do hope that there will not be a lot of half completed booths on the opening night, with nothing to show to whom they belong.

These fairs have done a vast amount of good to this city and to this coast. They bring producer and consumer together on good terms. The manufacturer exhibits to the people among whom he lives and to whom he will sell his goods, and shows there his products in all their forms.

That these exhibitions are appreciated is evidenced by the crowds that attend them, and the very full exhibits made. This year we are more prosperous in this city and State than for sometime past, and the fair ought to excel preceding ones.

We particularly hope this year to see a full and complete exhibit of mining machinery. The Eastern States are now competing with us in this branch and endeavoring to get our trade. They have not been successful, nor is it likely they will. There are many appliances for mining and metallurgy made on this coast which have never been exhibited at any of our fairs. Concentrators, settlers, amalgamators of all kinds, pulverizers, crushers, sluices, riffles, etc., all at work in the fair building, would give people some idea of these sort of things. Most of them know what a stamp mill is, and that is all.

Judging from entries at present writing, and what is known to be forthcoming, a very large and varied exhibit of California products, natural and manufactured, will be made.

CHEMICALS IN AMALGAMATION.—The Tombstone *Epitaph* thus comments upon the change inaugurated by Prof. Church in the system of treating the Tombstone M. & M. Co's. ore. About six months ago he dropped out of use in amalgamation all chemicals, using quicksilver alone. Some of the "practical" millmen said it would prove a failure, predicting fouling and loss of quicksilver and a reduced percentage in the yield of the ore. The question has now passed beyond the experimental stage, and has become a demonstrated fact that his simple treatment is a perfect success in every way. For the month of May they extracted 84½% of the precious metal contained in the ore, and the bullion averaged 10% finer than in the previous month's work. The loss of quicksilver was also less per ton than heretofore.

The Comet.

At the last meeting of the Academy of Sciences, Prof. Davidson spoke at some length concerning the comet, giving many off-hand illustrations on the blackboard, describing his observations in detail. He said a few nights before June 24th, the comet at its lowest declination, passed below the horizon, hence arose the popular report that there were two comets. It really appears to circle around the north star, as our own sun appears at times to those within the Arctic circle. He had ascertained its right ascension within three to four-hundredths of a second by a transit instrument, and its declination by a 6½-inch equatorial telescope. He observed its physical characteristics under a power of 50 to 200 diameters. June 24th, it had a well-defined nucleus, whose disk was more sharply defined than the planet Uranus. At times there existed an abnormal and irregular refraction of the atmosphere. It first presented three beams of light radiating from the central nucleus to the inner rim of the outer envelope, having considerable luminosity between them, and casting a well-defined shadow. One side of the coma or tail, was brighter than the other. June 25th, the envelope was less light around the nucleus, and the peculiarities of its beams had changed. With the telescope he saw six small stars through the tail, and four or five beams of light radiated from its head. June 26th, these rays so multiplied as to set upon the comets head like an expanding crown. On a subsequent night, while its nucleus still continued well defined, it took a wholly different shape. All these rapid changes indicate an intense activity and altered its whole characteristics of the shadow. The phenomenon of two apparent envelopes of light was still maintained. The following night this segmental beam of light cast a shadow almost equal to the nucleus. July 8th, he found very unexpectedly that the first envelope was merging into the second, indicating a great abnormal change unlike any astronomical drawings known to him. Its tail, which had slightly exceeded 15°, had decreased nearly half a degree each night, but has retained a very fair nebulous form. For the last six or eight nights, however, he has detected no shadow, only a nebulous mass, and the breadth of its nucleus and coma or tail have each decreased, one side still appearing brightest. He used a Browning five prism spectroscope, whose use he illustrated. He found it impossible to fully determine whether the spectrum was homogeneous and the nucleus solid, or whether special lines crossed it, showing it to be incandescent or fluid, as the atmosphere around the observatory was too unsteady. Some indications appear to lead to a belief that parts of the spectrum observed may be influenced by reflected sunlight, and some broad lines at times visible, presented a spectrum like the hydro-carbons. Prof. Henry Draper says the light of the coma or tail, is from the nucleus or head itself, and is not reflected sunlight. He then illustrated the orbits of the meteoric showers through which the earth passes November 10th, 14th, and 27th. One of these goes beyond the planet Uranus, and has a period of 33 years, dating from about 1832. He gave the opinion of an eminent German astronomer, to whom was awarded the gold medal of the British Royal Astronomical Society, that these meteors were the waste particles thrown off by comets, and showed how he had demonstrated that these meteoric belts were on the exact courses of comets, whose spectrum revealed that they were composed of the same elements of the comets whose courses they occupied. When these meteors of various sizes strike our atmosphere they fuse from friction, and become very brilliant as they are rapidly melted, and drawn to the surface of the earth. Astronomers now think meteoric matter the debris of comets, who loose much matter continually on their course. The doctrine of a resisting medium of ether in space, outside of the atmosphere of planets has been exploded.

ADVICES from Bowie station, San Simon valley, Arizona, are to the effect that a very singular epidemic prevails among the workmen of the Bowie mill and mining company. The symptoms of the disease are peculiar pains in the throat, dizziness and nausea. A number were taken down about the same time, and one died before the informant left. It was first thought to be poisonous air in the shaft, which is 200 ft. deep, but later investigations seem to indicate that it is caused by the water used. It is believed that several others will die.

COPPER WORKS IN WALES.—In answer to an inquiry, "a correspondent" is informed that what is known as the Hafod Copper Works, comprise the great works of Vivian & Sons, Dellwyn & Co., Williams, Foster & Co., and others. In the neighborhood of Swansea, is also Greenfell & Sons' establishment. At Llanelly, Camarthonshire, are the fine works of Neville & Co., and at Pembrey are the works of Elkington & Co.

THE Wood River *Times* says that the miners of the region have no use for capital, intimating that the claims are rich enough to work themselves.

Effect of Cold on Giant Powder.

Giant powder freezes at about 44° Fahr., and gradually becomes hard, when it cannot be exploded with the Giant powder caps. When received at a mine and is not already frozen, it should be kept in some warm place, where it cannot freeze, to avoid the trouble of thawing it. When the powder is frozen it never should be used for blasting. The powder may be in a granulated state, apparently soft to the touch, and yet the nitro-glycerine (the explosive property of the powder) be so chilled that its strength is only partially developed by an explosion. Frozen powder, when confined in a drill hole, can be exploded by using a heavy primer of thoroughly thawed Giant powder No. 1. Knowing this fact, it is foolhardy for men to try to pick out a charge of frozen powder from a drill hole, as it is always more or less attended with danger.

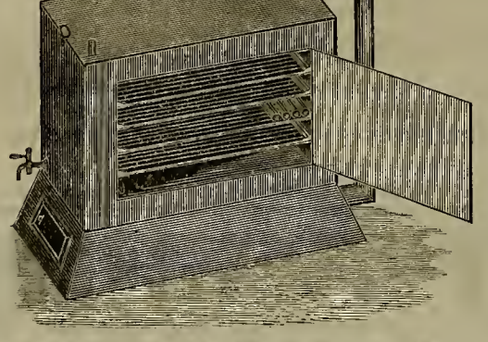
The Giant Powder Co. issue the following instructions as to the best methods of thawing the powder when frozen:

1. Put a layer of cartridges of frozen powder in a box partially filled with hot ashes, or sand, of about 100° Fahr., and cover them well with the same material. Many miners prefer this to any other method for thawing powder.

2. Put a layer of cartridges in a wooden box and place the box near the boiler in the hoisting works or mill, or other warm place, turning the cartridges, from time to time, until the powder becomes soft and warm. It is then ready for use. The warmer the powder is when used, the greater the execution of the blast. After being well thawed it should be used at once before getting cold again.

3. Miners, by placing several cartridges in their boot legs, when going to work, will find the natural warmth of their bodies sufficient to thaw the powder, while they are "striking in a hole."

4. During the winter months, keep the powder in a *warm*, dry room, on shelves or slats; when once thawed out, it will remain so.



FURNACE FOR THAWING FROZEN GIANT POWDER CARTRIDGES.

The latest improvement in this direction, however, we illustrate herewith. This is simply a jacketed chamber containing shelves on which the cartridges are laid, a small furnace underneath heating the water in the jacket. By this means the cartridges can never be heated above the boiling point of water, and there is no danger of explosion. The Giant Powder Company are now making these little furnaces for use at mines and on railroads. One large railroad in Oregon is now using some 50 of these thawing furnaces. They are easily carried along, and a fire can be built in them right where they stand, wherever that may happen to be. At mines the furnace could be placed in any convenient position.

A PAYING MINE.—The Eureka Consolidated mine at Eureka, Nevada, is a first-class mine. The net profit for the year ending February 28, 1881, was $1,142,000, or 87⅓% on the entire capital of the company. Out of this sum five dividends have been paid, amounting to $685,000, and $28,500 was paid in legal expenses and the purchase of other claims, the balance of the reserve fund, including what was carried over from last year, amounting to $75,000. The Directors, proposing to strengthen their working capital and carry a large reserve fund, will only pay out of this balance $250,000 in dividends. Fifty-one thousand two hundred and thirty-six tons of ore have been smelted during the year by the two large furnaces, of which 42,593 tons were raised from the Richmond mine, and 8,643 tons purchased, yielding with 153 tons of flue dust, 40,702 ounces of gold, 1,064,610 ounces of silver and 10,974 tons of lead. The total production of all the furnaces for the year was 47,546 ounces of gold, 1,285,325 ounces of silver and 12,596 tons of lead. The cost of mining and handling and all other general and working expenses at Eureka was $1,500,000 for the year. The average assay of ore was $68.12 per ton, as against $63.12 last year, while the working expenses of mining have been reduced from $11.02 to $9.58 per ton, and of smelting from $13.16 to $11.21 per ton, the net increase in profit for the year being $500,000. Sixty-three thousand seven hundred and two tons were smelted by the furnaces, or an average of 1,220 tons per week the year round.

Tension Apparatus for Cable Railways.

In the construction of railways in which cars are propelled upon a track by means of an endless cable moving in a tube beneath the surface of the ground, and connected with the cars by means of grips upon the cable, means must be provided to take up or compensate for the elongation of the cable which takes place in use. When the cables are of considerable length, the elongation is so considerable that, when ordinary means are employed, they are insufficient for the work, and the endless cable must be cut and a portion taken out, or it must be passed one or more times around a drum to take it up.

The usual method for keeping a tension upon the cable is to pass it around large pulleys at one or both ends, and these pulleys are mounted upon trucks. A chain passes from the rear and of the truck over a stationary pulley, and is attached to a heavy weight within the pit, and this produces the required tension. The cable soon stretches, however, so that the greatest depth of pit which can be conveniently used within a roadway is insufficient for the sinking of the weight, and the cable must be taken up, either by removing a portion or by taking one or more turns around the pulley. This process must be repeated, and causes delay and inconvenience.

Henry Root, Superintendent of the California St. Cable Railway Co., has designed and patented through the MINING AND SCIENTIFIC PRESS Patent Agency, an apparatus which answers as a perpetual compensator and tension apparatus, which may be adjusted without stoppage or delay.

It consists of a wheel grooved to receive the cable, this wheel having its shaft journaled in boxes upon the frame work of a car which is provided with wheels. These wheels are flanged and run on rails preferably set in line with the cable. A heavy chain or rope is secured to the rear end of the car and passes backward over a pulley and thence down to a weight sufficiently heavy to keep the necessary tension on the cable. The rails or timbers on which the wheels run are united to a frame work which rests upon long timbers, also set parallel with the line of rails.

Upon the upper surface of the lower timbers are formed strong racks, and the rear ends of the upper timbers have powerful hook pawls, which engage with the racks and thus hold the timbers at any desired point. In order to draw the timbers back when necessary, a powerful double block, with suitable ropes, connects the rear of the frame work with the masonry at the rear of the excavation. A gipsy is keyed to the shaft of the cable wheel, and the end of the rope is carried from the block to the gipsy, around which it may be passed a few turns, hanging loosely, so that the gipsy turns freely within it ordinarily.

When the cable is first put to work, the weight will be drawn up close to the frame-work, but as the cable stretches, the weight, keeping up the tension, gradually descends until it is at the bottom of the pit. It is then necessary to draw it up again. This is done by drawing upon the free end of the rope until it binds upon the gipsy, thus acting on the blocks and drawing the frame backward until the weight is close up to the pulley in the frame.

The hook pawls engage with the teeth of the jack and hold the movable frame in place. The tension is thus kept up, and the elongation of the cable is compensated without cutting it or having it turn about a drum; and when the weight has descended to the bottom it is at once raised again by the block and tackle without disturbing the cable.

The frame and rack may be of any desirable length, from 60 to 100 ft. long, depending on the length of cable running. The adjustment is thus made ample for any stretching of cable. At the ends of the roads the apparatus will be connected with the horizontal sheaves around which the cable passes.

MINERS' UNION ELECTION.—At their last meeting, the Virginia Miners' Union elected the following officers: President, M. Abrams; Vice-President, J. D. Cameron; Recording Secretary, Andy Young; Financial Secretary, John Ross; Treasurer, Denis Nevin. Trustees, A. J. Burns, Martin O'Shea, Richard Henderson, A. L. Day and Edward McDonald.

Industrial Items.

THE capital of a cotton mill near Boston has grown from $160,000 to $2,500,000 in 10 years.

A BOSTON man has invented a machine that manufactures seamless paper boxes at the rate of 20 per minute.

THE length of the railroads built in the United States in the year ending April 1, 1881, was 6,113 miles, twice the mileage of the preceding 12 months.

CAREFUL inquiry by the *Age of Steel*, published in St. Louis, refutes the statement that there is an over production of pig iron in America. All steel mills agree that they prefer American iron to the foreign.

A LARGE grain elevator about to go into operation in St. Louis will employ as elevating power three gas engines, which will be located in the cupola of the structure. The experiment will be watched with much interest.

THIRTY-NINE locomotives were shipped from the three locomotive works in Patterson, N. J., during the month of June. This number was never exceeded but once. The average weight of engines is constantly on the increase. Four of the locomotives were sent to Spain, being part of an order of 10, the first ever received in America from that country.

AMERICAN machine-made watches, which have driven the English and Swiss hand-made articles out of domestic markets, are now proving formidable competitors for the markets of the world. The Waltham Watch Co. now turn out 750 watches a day and employ 1,600 work people, the demands of their increasing foreign and domestic trade force them to enlarge their facilities. This is being done by replacing the older buildings with new and larger ones, whereby the force employed will be fully doubled. The increase being from about 1,000 employees to 2,000.

IN 1830 not a single locomotive engine had been built in America. The first two were brought from England that year. The number of locomotive engines in use January 1, 1879, was 16,445, valued at $164,450,000; the number of cars, including palace and freight cars, was about 300,000, which at a low estimate, would cost $60,000,000. About one-tenth of those now running must have been rebuilt probably five times, since 1830, at a cost of $382,225,000, making a total of $1,146,675,000, or about twice as much as England has invested in ships. Besides this, we have built locomotive engines for export to all parts of the world. Of all those used in the English colonies, from 95% to 99% were built in the United States. Since 1870 we have exported $25,000,000 in locomotive engines, and double that amount in cars.

Pure and Impure Water.

If there is any one subject connected with the household which requires more attention than another, it is that of pure water for man and beast. Every medical man knows that impure water is a fertile source of disease in human beings, and innumerable outbreaks of a typhoid nature have been distinctly traced to this cause. Many of the diseases in cattle have their origin from the impure water which they are compelled to drink. In many localities in this country a "mud hole" or "sink" filled with partly stagnant water is the only source of supply for farm animals during the long hot summer, and it is no wonder that diseases of various kinds follow such treatment.

There does not exist two sets of sanitary principles, one affecting human beings and the other the beasts of the field. Impure water, imperfect ventilation, dirt and damp, exercise injurious influences on the health of our domestic animals just as these agents do in the case of human beings. Every practical man should therefore seek to remove these sources of evil as speedily as possible.

Machinery and tools for obtaining good pure water have, of late, been perfected and simplified, so that there is no reason why every man should not have an abundant supply, both for household and stock, no matter where he is. Thousands of large land owners would be justified in purchasing the necessary machinery and tools for prosecuting their own work in this direction; and people with small places in the country would find it to their interest were they to club together and purchase the necessary outfit for sinking wells convenient to house and field. In the cities there are men who sink these wells for a specified price per foot, where the geological peculiarities of the section are known.

THE repeal of the bullion tax by the last Legislative Assembly of Arizona, met with strong denunciation in many quarters. It is now promised that this question shall be a considerable factor in the next Territorial campaign. Party lines will be entirely obliterated in the contest. The county of Gila, by its Board of Supervisors, has already adopted resolutions looking to the re-establishment of the tax by the next Legislature.

THE Homer *Index* says that Joe Curtis's gravel prospects in the old Mono diggings are getting brighter and better every day. He already has uncovered a good bank of auriferous gravel, which is rapidly widening out.

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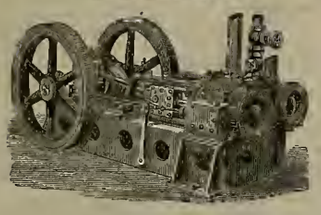
PRICES REDUCED.



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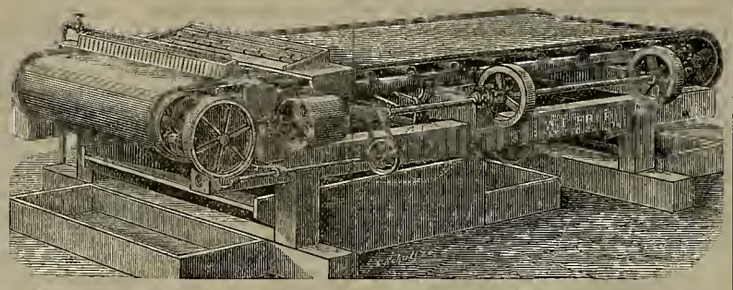

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It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 XX is the Strongest Explosive Known.

No. 2 is superior to any powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.

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Office, No. 230 California Street - - San Francisco, Cal.

GIANT POWDER

MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS.

Nos. ONE, TWO and THREE.

Stronger, Better and Safer than any other High Explosive

Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. Triple Force Caps and all Grades of Fuse.

BANDMANN, NIELSEN & CO.,

SAN FRANCISCO, CAL.

Excelsior Blasting Powder,

—MANUFACTURED BY—

THE EXCELSIOR POWDER COMPANY.

This is no NEW PATENT NON-EXPLOSIVE SAFETY POWDER, but the GENUINE STANDARD ARTICLE, and as safe to use and handle as any Nitro-Glycerine Powder manufactured. The Fumes and Gases, common in other Nitro-Glycerine Powders, are almost destroyed, and do not leave the miner with headache or nausea. Among the numerous recent testimonials the following is but a fair sample, constantly received, attesting the superiority of EXCELSIOR POWDER:

AUBURN, Cal., May 26, 1881.—EXCELSIOR POWDER CO.: I send you per Wells, Fargo & Co., a box containing samples of country rock through which I am running our tunnel on the Conrad Mine, and through which we have now run 425 feet, 2.5 feet of it having been done with EXCELSIOR POWDER. If any one can produce harder rock I would like to see it. I here say that I can do more execution with your No. 2 Powder in this rock than I can with any No. 1 Powder of any manufacture I have ever used, and I have used every kind now manufactured here, excepting "Tonite," and I have had 20 years' experience in blasting. Respectfully yours,

E. W. ROBERTS, Superintendent.

Give this Powder a trial and you will use no other. For Strength and freedom from noxious fumes, it has no equal. Address all orders to EXCELSIOR POWDER CO., No. 330 Pine Street, Rooms 53 and 54, Academy Building, San Francisco, Cal.

VULCAN BLASTING POWDER.

—THE MOST ECONOMICAL AND BEST—

Nitro-Glycerine Explosive in the Market.

In the suit of the Giant Powder Co. against the Vulcan Powder Co. for *alleged* infringement of Patent, it was held that the Giant Powder Patent was INVALID.

Nos. 1, 2 and 3 Vulcan,

Each grade superior to like numbers of any other Nitro-Glycerine Powder in the market.

VULCAN B. B.,

Superior to Black, Judson or any low grade Powder for Bank Blasts, Railroad work, or any work where Black Powder has been heretofore employed.

TRIPLE FORCE CAPS AND ALL GRADES OF FUSE.

The CONSUMER'S COMPANY sell the best Powder at the lowest rates.

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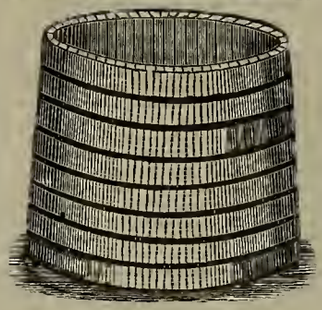

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WATER TANKS,

Made by machinery. Best materials in use. Every piece numbered. No skill required in setting up. Shipped to all parts of the coast. PAN STAVES, WOOD PULLIES and BATTERY GUIDES a specialty.

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Carson and Colorado Railroad,

NEVADA, NOW IN OPERATION TO HAWTHORNE, 110 MILES SOUTH OF CARSON, NEV.

The direct, shortest and cheapest route for freight and passengers to the following mining towns and camps: Aurora, Bodie, Bridgeport, Belleville, Candelaria, Columbus, Benton, Montezuma, Silver Peak, Alida Valley, Bishop Creek and Gold Mountain.

C. and C. R. R. trains make close connection at Mound House Station with trains of Virginia and Truckee Railroad, making close connection at Reno with East and West bound trains of the C. P. R. R.

Passengers leaving San Francisco and Sacramento on C. P. Overland train arrive at Hawthorne and connect with U. S. Stage Company's line of Concord coaches at 2:45 P. M. of the following day, arriving at Bodie same evening.

Wells, Fargo & Co.'s line of Fast Freight Wagons leave Hawthorne daily, delivering fast freight in Bodie within 36 hours from San Francisco.

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WM. D JOHNSTON,

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ESTABLISHED, 1869. C. A. LUCKHARDT, Manager.

Ores Worked by any Process.

Ores Sampled.

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Analyses of Ores, Minerals, Waters, Etc.

Working Tests (Practical) Made.

Plans and Specifications furnished for the most suitable process for working Ores.

Special attention paid to Examinations of Mines, plans and reports furnished.

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MINE and MILL SUPPLIES,

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.

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Ores Sampled and Assayed, and Tests Made by any Process.

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The office of the STETEFELDT FURNACE CO., having been removed to New York, parties wishing to obtain information in San Francisco about the Stetefeldt Furnace will apply to Messrs. Prescott, Soott & Co., Union Iron Works, San Francisco. C. A. STETEFELDT.

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Lap-Welded Pipe, all Sizes, from Three to Six Inches. Arteeian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.

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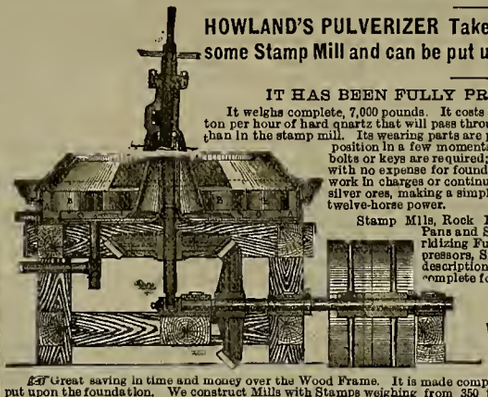

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IT HAS BEEN FULLY PROVED AND TESTED.

It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.

Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies Iron Work complete for Wood Frames, also

SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.

☞ Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.

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The "OLD RELIABLE" with improvements, making it

THE MOST PERFECT TURBINE NOW IN USE.

Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.

Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address

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STEEL CASTINGS

FROM 1-4 TO 10,000 lbs. WEIGHT.

True to pattern, sound and solid, of unequaled strength, toughness and durability.

An invaluable substitute for forgings or cast-iron requiring three-fold strength.

Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.

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HIGHEST PRICES PAID FOR

Gold, Silver and Lead Ores and Sulphurets.

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ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.

This Company has the best facilities on the Coast for working

GOLD, SILVER and LEAD

IN THEIR VARIOUS FORMS.

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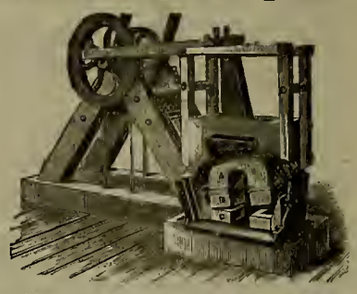
HUNTINGTON'S Oscillating Stamp Mill



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For Simplicity, Economy, Durability and Effective Working, It exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power.

Price, 900-Pound Hammer, - - - $500.
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DuBOIS' Automatic Quicksilver Feeder.

A machine for feeding quicksilver to the mortare of GOLD MILLS. It is so connected to the cam shaft, that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a mechanical movement, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding ordinary hand-feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect. Price complete, $100.00. Send for circular.

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All orders accurately and moderately carried out. (Send for Circular.)

BOILER COVERINGS.

Plastic Cement and Hair Felt, with or without the Patent "AIR SPACE" Method. Cement ready for use by the barrel.

G. C. FOWLER, No. 413 Pacific St., S. F.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING JULY 12TH, 1881.

9,793.—PILLOW SHAM HOLDER—Re-issue—J. R. Adams, Oakland, Cal.

9,802.—BARREL TAP AND FAUCET—Re-issue—E. T. Barlow, S. F.

244,115.—DUST PAN—Emma L. & M. A. Deitz, Oskland, Cal.

244,051.—STEAM BOILER FURNACE—C. I. Hall, S. F.

244,240.—ORE AMALGAMATOR—W. H. Howland, S. F.

244 241.—MACHINE FOR GRINDING ORE—W. H. Howland, S. F.

244,134.—TIMBER FRAMING MACHINE—Isaac Lepley, Amador, Cal.

244,139.—RUNNING GEAR FOR CARRIAGES—M. J. McCne, S. F.

244,144.—FEEDER FOR THRESHERS — John Ransford, Stockton, Cal.

244,117.—STEAM WAGON.—A. H. Elfers, Bakersfield, Cal.

244,147.—TENSION APPARATUS FOR CABLE R. R.—H. Root, S. F.

244,030.—COMPOSITION FOR DISSOLVING THE COATING OF GOLD IN ORE.—J. F. Sanders, Ogden, Utah.

234,098.—ORE FEEDER—Edward W. Wagner, Enterprise, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

TIMBER FRAMING MACHINE. — Isaac Lepley, Amador City. Dated July 12, 1881. No. 244,134. This is a novel method for framing timbers of all kinds, but is specially useful for mining work. It consists in the employment of cutter-heads, which are caused to rotate upon a suitable frame, and this frame is moved both vertically and horizontally by means of slides and guides, so that the cutters may be carried across the timber upon either or all four sides to form a tenor, dove tail or other cut; and, if desired, a round tenor may be formed by the use of a link, which has one end fixed to the frame so that the slides will move in a manner to carry the tool around in a circle. This machine was described and illustrated in detail in the MINING AND SCIENTIFIC PRESS of January 22, 1881.

STEAM WAGON.—Aug. H. Elfers, Bakersfield, Kern county. Dated July 12, 1881. No. 244,117. This invention relates to that class of wagons adapted for the use of steam as a motor. It would be difficult to describe the details without the use of engravings. The wagon, however, is so made as not to require a special engine. By making the crank adjustable it can be made to accommodate itself to the stroke of almost any engine, and hence a farmer who has already a steam threshing engine can use it to drive this wagon, by removing it from its own truck and placing it upon the wagon, and connecting its piston-rod with the driving shaft, and adjusting the crank to the stroke of the engine In order to reverse the engine and drive the wagon in an opposite direction a peculiar construction is adopted, whereby the inventor is enabled to do this with simply one eccentric, by changing the throw of said eccentric.

FEEDER FOR THRESHING MACHINES. — John Ransford, Stockton. Dated July 12, 1881. No. 244,144. This invention relates to certain improvements in the feeding device which supplies unthreshed straw to the cylinders of threshing engines. It consists in a series of notched inclined feeding timbers or arms, placed side by side, and operated by an eccentric or crank to give them a reciprocating motion. Each arm being provided with peculiarly constructed flanging forks, the upper ends of which push forward the mass of straw above, while the lower ends push that below and keep the spaces between the reciprocating arms clear. The position of the device with regard to the threshing cylinder must be determined by convenience. Generally, of course, it should be attached to the threshing machine, so that its reciprocating arms could feed the straw down to the front of the cylinder; but whether on top or toward its lower part must be decided by circumstances.

SACRAMENTO county has brought suit against the hydraulic miners for allowing their debris to flow into the rivers. It is daily becoming more apparent that the present strife between the farming and mining interests is being kept up through the influence of scheming lawyers and others who thus desire to obtain lucrative salaries for their services.

NEW ENGLANDERS are proverbially cautious about mines, but when the Boston *Economist* says, as it does in its issue of July 2d, that "there is no safer average investment to-day than in mines, provided it be made intelligently and with ordinary prudence and foresight," we may expect to see New England capital seeking investments in the mountain regions.

THE celebrated Mulatos gold mine, of Sonora, has been bonded for $2,000,000 by New York capitalists.

Our Home Industries.

The Mechanical and Manufacturing Interest of San Francisco.

The following facts and figures from the annual report of the Assessor to the Surveyor General, will show the statistical features of our home industries:

Artificial stone manufactories 2, men employed 124, value of manufactures $328,950.

Axle grease manufactories 2, men employed 11, value of manufactures $39,480.

Barrel manufactories 3, barrels made 356,291, men and boys employed 184, horse power of steam engines 80, barrels made for use of sugar refineries 76,650, syrup kegs made by tub and pail factories 13,650, value $221,550.

Bag manufactories 5, men, women and boys employed 284, number of bags manufactured 15,073,740, value $2,188,450.

Bed spring manufactories 3, men employed 28, copper wire used 583 tons, aggregate value manufactured $198,000.

Bedstead manufactories 5, men 264, lumber 440,000 ft., value of manufactures $143,000.

Bellows manufactories 2, men 12, bellows made 1,600, value of manufactures $32,000.

Bedding 7, men 341, value $819,000.

Billiard tables 3, men 20, tables made 127, value $28,000.

Boots and shoes 56, men, women and boys 2,430, value $1,508,000.

Box factories (wooden) 6, men 305, lumber 8,505,000 ft., value $957,600.

Box factories (paper) 5, men, women and boys 62, boxes made 689,500, value $46,200.

Box factories (cigar) 3, men, women and boys 140, boxes made 240,000, value $110,000.

Brass foundries 8, men 290, value of, including copper 500 tons, $510,000.

Breweries 43, men 356, hops 632,500 lbs., barley 26,450 tons, beer made 356,500 barrels, value $2,415,000.

Brooms 14, men 80, brooms 50,000 dozen, value $150,000.

Broom handles 2, men 10, handles made 800,000, value, $12,000.

Brush factories 3, men 34, value $79,200.

Candles 4, men 161, candles manufactured boxes 241,500, value $563,500.

Carriages and wagons 30, men 180, carriages and wagons made 500, railroad street cars and dummies 120, value $330,500.

Coffee and spice mills 16, coffee ground and roasted 5,700,000 lbs., chocolate 327,000 lbs., spices ground 500,000 lbs., value $1,167,000.

Corset factories 4, men and boys 20, value $15,000.

Coffins 4, men 32, value $115,500.

Cordage and rope 1, men 110, hemp rope 2,600 tons, value $560,000.

Clothing 12, men and women 4,830, value (including overalls, suits and underware) $3,662,500.

Cigar factories 200, men, women and boys 3,250, cigars 90,750,000, cigarettes 9,900,000.

Cement pipes 2, men 138, value $402,500.

Crackers 4, men 130, value $1,120,000.

Chemical works 2, men 53, value $520,000.

Carriage springs 1, men 17, springs made (tons) 130, value $60,000.

Cutlery 2, men 37, value $52,500.

Dry docks (floating) 2, men 15, capacity of docks (1.1800 tons, 1.800 tons) 2,600.

Dry docks (stone) 1, men 6, total cost of work $675,000.

Electric machinery works 2, men 45, capital $165,000.

Elevator manufactories 2, men 28, value $7,700.

Fringe factories 5, men and women 60, value $86,250,

Flour and feed mills 8, men 90, flour made (barrels) 204,000, hominy made (tons) 247, buckwheat and rye flour (tons) 385, oatmeal and groats (tons) 2,760, cornmeal and farina (tons) 3,960, feed barley (tons) 9,720, cracked wheat (tons) 864, split peas (tons) 636, graham flour (barrels) 6,360, cracked corn (tons) 732, ground feed (tons) 1,320, pearl barley (tons) 720, run of stone 52.

Foundries, boiler and iron works 15, men, 1,200, pig iron (tons) 18,270, bar iron used (tons) 16,250, rivets used (tons) 350, California iron used to June 30th (tons) 1,200, value, $3,120,000.

Fur manufactories 5, men and women 55, value $270,000.

Furniture manufactories 18, men 1,610, lumber used (ft.) 1,080,000, value $1,839,750.

Gas works 1, men employed (about) 400, capital stock $10,000,000.

Glass works 1, men and boys 180, furnaces 22, pots 7, value of manufactures $213,400.

Glass cutting 2, men 20, value of manufactures $55,000.

Gloves 20, men and women 207, value $180,000.

Glue 1, men 15, glue (tons) 150, neatsfoot oil (gallons) 6,500, value $100,000.

Gold refineries 1, men 50.

Gutta percha and rubber 2, men 11, value $17,200.

Hat and caps 18, men 192, value $342,000.

Hose and belting 5, men 19, hose 1,200 ft., belting 129,000 ft., value $150,000.

Harness 50, men 350, value $1,000,000.

Ink and mucilage 1, men 10, made annually, 10,050 dozen.

Ice manufactories 3, men 42, tons made 2,640, capital invested $108,000.

Japanning and galvanizing manufactories 2, men and boys 16, value $21,000.

Jewelry manufactories 16, men 168, value $552,000.

Lead and shot manufactory 1, men 140, lead pipe and shot made 4,700 tons, value $7,000.000.

Lead smelting works 1, men 116, value $760,000.

Last manufactories 2, men 11, lasts made 18,700, value $24,200.

Linseed oil works 2, men 60, oil cake 4,300 tons, capacity of works yearly 8,000,000 gallons, value of oil $580,000, value of cake $135,000.

Macaroni and vermicelli 6, men and boys 36, macaroni and paste made (boxes) 154,000, value $154,000

Marble works 22, men 253, value $632,500.

Matches 8, men 60, matches made gross 408,000, value $672.000.

Malt houses 6, men 58, grain malted tons 16,900, value $805,000.

Mirror manufactories 2, men 7, capital invested $172,500.

Musical instrument 2, men 16, value $10,000.

Oil clothing 4, value $11,000.

Oakum 1, men 21, bales made 10,500, value $42,000.

Pickle and fruit preserving 11, men and women 1,955, fruit and meats put up (dozen cans) 575,000, pickles put up in kegs 59,800, value $1,840,000.

Powder works 1, men 31, powder made 1,331,500, value $450,000.

Provisions packing 2, men 145, meats packed 8,500 barrels, pork 8,000 barrels, ham and bacon 2,500,000 lbs., lard 1,300,000 lbs., tallow 50,000 lbs., value of investment in real estate, fixtures, etc., $130,000, value of products, $1,450,000.

Pump manufactories 2, men 16, pumps made 380, value $90,000.

Rolling mill 1, men employed 319, scrap iron used 17,314 tons, coal consumed 11,660 tons, value $1,104,950.

Salt works 3, men employed 52, number of tons 19,550, value of salt ground $217,500.

Safe and vault works 1, men 20, value $30,000.

Saw manufactories 2, men 33, value $110,000.

Sash, blind and door 15, men 2,100, ft. of lumber consumed annually 11,050,000, value $5,040,000.

Silverware 3, men 50, value $150,000.

Shirt 3, men and women 1,100, value $500,000.

Slippers 25, men and women 1,000, value $470,000.

Soap 21, men 345, pounds soap made 25,200,000, value $2,735,500.

Sugar refineries 2, men 320, sugar (raw) used 80,560,000 lbs., white sugar made 29,550,000 lbs., yellow sugar made 31,880,000 lbs., syrup made 647,000 gallons, value $6,635,000.

Tanneries 43, men 380, bark used annually 5,860 cords, hides of all kinds 393,300, value $1,932,000.

Tool manufactories 11, men 79, value $50,000.

Type foundries 2, men and women 46, value $50,000.

Vinegar 2, men 20, vinegar made annually 24,000,000 gallons, value $180,000.

White lead 1, men employed 75, tons manufactured 2,400, capital employed $250,000.

Windmill manufactories 2, men 10, mills made 110, value $22,000.

Willow ware and baskets 2, men 8, value $6,000.

Wine casks 1, men 210, casks made 3,800, value $84,000.

Woolen mills 2, men and women 819, blankets made annually (pairs) 93,600, hosiery (dozens) 14,040, wool used (lbs.) 3,000,000, cloth and tweed (yarde made) 702,000, flannels (yards made) 800,000, value $1,755,000.

Wire rope 1, men 46, amount of wire consumed (tons) 600, value $320,000.

Wire works 2, men 48, value $75,000.

EMPLOYEES OF MECHANICS' FAIR. — At a meeting of the Board of Managers of the fair, held this week, the following employees were appointed to serve during the fair: Day sergeant of the watch, T. S. Tweedale; assistant, William Moore; night sergeant, H. L. Baker; watchmen, T. Olvaney, Wm. Lyman, J. Mulcahey, O. Langley, J. L. Mason, J. Greer, H. Aeh, G. S. Dougherty, C. H. Warren, T. Tweedale, J. Mann, J. Rainford, H. Savage, F. Johnson, J. Mulligan, J. Flaherty, D. O'Connor; gas inspector, S. N. Grubb; engineer, J. C. Holmes; carpenter, A. J. Beacher; gardener, T. Sagwell; sanitary inspector, C. Orth; messenger, J. Evatt; ladies' room, Mrs. Platt; cloak room, Mrs. Lawson; ticket office, J. Hobe, J. Feldbush and Mrs. Allen; doorkeepers, George Haman, J. McLeay, A. Lyon, H. Hotchkiss and D. Pratt. It was decided to have an illuminated waterfall and a prismatic fountain among the other novelties, to add to the attractions of the fair.

IMPOUNDING DEBRIS.—Mr. O'Brien, Superintendent of the mines at Smartsville, is now building dame at the mouths of some of the ravines to hold back the tailings, so far as possible, and prevent injury below, should the injunction be dissolved so that the mines can be worked. Owners of other mines are moving in the same direction, with a view to prevent, if possible, injury to the country below, and still continue the working of the mines.

THE Wood River *News* says that the importance of the Hood mining district of late has suggested metropolitan ideas, and now they have surveyed a town site near Champagne & Norris' old station, which they have dubbed Springer. It is a good location, convenient to wood and water; and if the mines there are placed in the hands of capitalists, will prove a live town before snow flies.

News in Brief.

DEAN STANLEY is dead.

BOTH London and Paris are at present afflicted with a bad hot spell.

THREE comets are said to be visible every night at Guaymas, Mexico.

SALMON are now running in all the rivers of British Columbia in large numbers.

SIR EVELYN WOOD is to be raised to the peerage for his services in the Transvaal.

SAMUEL BRANNAN is having trouble with the Mexican authorities in regard to his land grant.

HESSY HELFMANN'S death sentence has been commuted to imprisonment, for what term is not stated.

THE President continues to improve, and it is now confidently believed that the danger line has been crossed.

THE Secretary of the Treasury has presented Ida Lewis with the gold life saving medal, authorized by act of Congress.

THE different Atlantic cable companies have given notice that they will reduce their rate to 25 cents per word after August 1st next.

A LONDON, Ontario, dispatch says the Captain and Superintendent of the ill-fated Victoria have been committed for trial at the Assizes.

FIFTEEN HUNDRED laboring men in the logging camps of Wisconsin are out on a strike for 10 hours, instead of 11 and 12 hours service per day.

A ST. PETERSBURG dispatch says: General Ignatieff recently received several threatening letters, purporting to come from the Nihilists.

MARTIN MURPHY and wife, who came to California in 1844, on Monday celebrated their golden wedding at Mountain View, Santa Clara county, in grand style.

THE track of the recent cyclone in Minnesota is 40 miles long by one mile wide Several lives were lost, and the property damage is estimated at $300,000.

THE London *Morning Post* hints that the protective tariff of the United States and other countries renders retaliation duties necessary on the part of England.

A LARGE meeting of Turkish bondholders in London has formally requested the former Under Foreign Secretary (Bourke) to go to Constantinople to arrange the Turkish debt.

A VIENNA dispatch says: Chimerical as it may seem, the Berlin and Vienna foreign officers are seeking to effect a political and trade alliance between France, Austria and Germany.

IN the rifle match at Wimbledon between the Lords and the Commons, at a single range of 50 yards, the Lords scored 440 and the Commons 393.

IN shooting for the international trophy on Saturday, at Wimbledon, the grand total scores were as follows: Scotland, 1,774; Wales, 1,086; Ireland, 1,642. Twenty competitors were in each team.

BILLY THE KID, the notorious murderer and outlaw, who for several years has been the terror of New Mexico cattle men, was on the 14th inst. killed by Patrick Garrell, Sheriff of Lincoln county.

SEVERAL Mexican Custom-House officers in attempting to arrest some smugglers were disarmed and tied to trees, where they remained for two days, until rescued by some friendly Papagos.

AFTER two years' labor, the fire in the Stanton shaft, Wilkesbare, Penn., has been subdued. The work of repairing the immense destruction caused by the water and flames is now being vigorously pushed forward.

DON CARLOS, the Spanish pretender, has been ordered to quit France. It is stated that he has been engaged in certain proceedings which are regarded as a manifestation against the present form of government in France.

A LAW student in the University of Bonn has just been killed in a duel, and another student is in the hospital hopelessly wounded. A student in Berlin a few days ago had his nose slashed nearly off. Scarcely a week passes but we hear of some such brutality.

THE agricultural laborers in many parts of Cork are dissatisfied at deriving no benefit from the improved circumstances of farmers consequent on the payment of reduced rents, and contemplate striking for higher wages during the harvest. The movement is fast gaining ground.

STATISTICS published by the Hamburg police authorities, show the number of German emigrants passing through Hamburg alone to America, from January 1, 1881, to June 30th, 1881, amounted to 74,633. If emigration proceeded in the same proportion the government will find that, reckoning fugitives by other channels, it has lost in 1881 about a quarter of a million of its subjects.

IT is stated that France has made a treaty with the chief of the Amados in Senegal for the exclusive right to found and open roads to the Niger. Segoo will be placed under a French protectorate, and a French resident will be stationed there. It is intended to build a railway up the valley of the Senegal toward Bamakoo on the Niger, in order to establish communication with Upper Soudan.

THE latest estimates of the harvest in Hungary agree that the yield of wheat will be much larger and of better quality than last year. Reports from Russia state that the yield will be excellent. Roumanian grain crops are much damaged by spring rains and storms. Reports from France show that the harvest, with few exceptions, will be excellent,

Mechanics' Fair Daily.

"A Valuable Publication."

BY AUTHORITY OF BOARD OF MANAGERS OF THE MECHANICS' INSTITUTE FAIR FOR 1881.

During the season, the MECHANICS' FAIR DAILY is the BEST AND MOST IMPORTANT ADVERTISING MEDIUM IN SAN FRANCISCO. While open, the Fair is THE LEADING ATTRACTION with both residents and visitors from abroad. Thousands attend daily, seeking and obtaining information. While thus in an investigating mood, the "great public" are more ready than at other times to receive evidences of the superiority of goods and inventions, and the claims and advantages offered by professional and active business men.

The DAILY will be printed on superior California made paper, in the presence of THOUSANDS OF VISITORS during every evening of the exhibitions, and DISTRIBUTED FREE, "fresh from the press," in IMMENSE NUMBERS.

This is our 12th volume. It will be well illustrated, spicily and ably edited, and, like all preceding volumes, it cannot fail of being EXCEEDINGLY POPULAR WITH OVER **100,000** EXHIBITORS AND VISITORS, and EXTRAORDINARILY PROFITABLE to advertisers in its columns. Our most enterprising, first-class business representatives will continue its principal patrons.

The DAILY possesses continuously a great advantage over all other desirable periodicals, from having, in large numbers, a new set of readers for each issue, aggregating an immense number from the most thrifty and intelligent portion of the community. Receiving it somewhat as a novelty, they are likely to peruse its entire contents; pass it around the home circle, and frequently send it to interested parties elsewhere.

Advertisements will be received at reasonable rates. It will be of advantage to patrons to secure the spaces wanted without delay.

Advertisements will be received by the publishers through telephone (No. 75) or we will send our business representative on request by telephone or postal card.

N. B.—The only official Catalogue of the Fair, during the exhibition, will be published complete in the columns of the FAIR DAILY, under authority of the Board of Managers.

DEWEY & CO., PUBLISHERS.

MINING AND SCIENTIFIC PRESS Office No. 202 Sansome Street, S. F.

P. S.—None but our firm has a right to contract for and publish, post, or circulate, in or about the fair, the advertisement of a second or a third party. Having paid (to the welfare of the Mechanics' Institute), for this privilege, we shall maintain our rights, under our contract with the Board of Managers, for the protection and benefit of all our patrons in the FAIR DAILY. Solicitors for advertisements to be circulated in the fair, without our authority, should be avoided by business men for their own benefit.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. F. OSBORNE—San Francisco.
G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—Napa, Nevada and Placer counties.
GEO. H. HOPKINS—Amador county.
A. LEONARD MEYER—Utah and Idaho Ter.
C. E. WETMORE—Alameda county.
J. M. WOLFE—California.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

THE 16th INDUSTRIAL EXHIBITION
OF THE
MECHANICS' INSTITUTE
OF SAN FRANCISCO,

Will Open Tuesday, August 2, 1881.

Board of Managers.

P. B. CORNWALL, Pres't,	A. W. STARBIRD, Vice Pres't,
J. A. BAUER, Treasurer,	DAVID KERR,
RICHARD GRAY,	SAMUEL DINSMORE,
C. WATERHOUSE,	J. R. WILCOX,
JAMES DRURY,	GEO. H. HOPPS,
A. R. WELLS,	EDWIN FRETWELL,
JAMES SPIERS,	GEO. SPAULDING,
J. H. CULVER, Sec'y,	J. H. GILMORE, Sup't.

Committees.

AUDITING.—Waterhouse, Kerr, Gray.
BUILDING.—Drury, Wells, Wilcox.
CIRCULARS AND CLASSIFICATION.—Fretwell, Hopps, Spiers.
PRINTING AND ADVERTISING.—Spaulding, Fretwell, Gray.
POWER AND MACHINERY.—Spiers, Dinsmore, Wilcox.
RULES, REGULATIONS AND AWARDS.—Dinsmore, Spiers, Bauer.
TICKETS AND ADMISSIONS.—Wells, Kerr, Fretwell.
MUSIC AND DECORATIONS.—Bauer, Starbird, Hopps.
PRIVILEGES.—Kerr, Starbird, Waterhouse.
LOCATION.—Starbird, Spaulding, Drury.
POLICE.—Gray, Drury, Spaulding.
HORTICULTURE.—Hopps, Waterhouse, Bauer.
GAS AND WATER.—Wilcox, Wells, Dinsmore.
ART.—Hopps, Bauer, Gray.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

THE State Mining Bureau, No. 313 Pine street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

Metals.

[WHOLESALE.
WEDNESDAY, July 20, 1881.

IRON.—	
American, Pig, soft, ton	— @30 00
Scotch, Pig, ton	26 00 @28 00
American White Pig, ton	— @—
Gregon Pig, ton	— @26 00
Refined Bar	4½@ 8
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	— @ 9½
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	16 @ 18
Black Diamond, ordinary sizes	13 @ 15
Drill	9 @ 10
Flat Bar	— @ 16
Plow Steel	9 @ 10
COPPER,—	
Ingot	— @ 52
Sheet	— @ 20
Sheating, Tinned 14x18	— @ 42
Nails	— @ —
Bolts	38 @ 42
Old	— @ 18
Bar	— @ 22
Precipitate, 100 fine	18 @ 19
LEAD.—	
Pig	4½@ 4½
Bar	— @ 5
Pipe	— @ 8
Sheet	— @ 9
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES.—	
10x14 I C Charcoal	— @ 8 00
10x14 I C Coke	— @ 5 50
Banca Tin	— @25 00
Australian	— @22 00
I. C. Charcoal Roofing 14x20	— @ 7 25
" " 20x28	20 00 @21 00
ZINC.—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS.—	
Assorted Sizes	3 50 @ 3 75

Mining and Other Companies.

Pereone intereeted in incorporated ehares will do well to recommend the publication of the official noticee of their companies in thie paper, as the cheapeet appropriate medium for the eame.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company,

SAN FRANCISCO, JULY 8, 1881.

At a meeting of the Board of Directors of the abovenamed Company, held this day, a Dividend (No. 10), of Twenty-five (25c) Cents per share was declared, payable on FRIDAY, July 15, 1881, at the office of the Company, Room 10, No. 328 Montgomery street, San Francisco, California. Transfer books will be closed on July 11, 1881.

JOSEPH NASH, Secrstary.

EXTRA DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

SAN FRANCISCO, JULY 0, 1881.

At a meeting of the Board of Directors of the abovenamed Company, held this day, an Extra Dividend (No. 40), of Twenty-five (25c) Cents per share was declared, payable on FRIDAY, July 15, 1881. Transfer books closed on Monday, July 11, 1881, at 3 o'clock P. M.

WILLIAM WILLIS, Secretary.

Office—Room No. 29, Nevada Block, No 309 Montgomery street, San Francisco, Cal.

REGULAR DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

SAN FRANCISCO, JULY 0, 1881.

At a meeting of the Board of Directors of the abovenamed Company, held this day, a Dividend (No. 48), of Fifty (50c) Cents per share was declared, payable on FRIDAY, July 15, 1881. Transfer books closed on Monday, July 11, 1881, at 3 o'clock P. M.

WILLIAM WILLIS, Secretary.

Office—Room No. 29, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Co.,

Nevada Block, Room 37, San Francisco, July 15, 1881.

At a meeting of the Board of Directors of the abovenamed Company, held this day, a Dividend (No. 09), of Fifty (50) Cents per share was declared payable on WEDNESDAY, July 27, 1881. Transfer books closed until the 21st instant. W. W. TRAYLOR, Secretary.

ASSESSMENT NOTICE.

Consolidated Pacific Mining Company.

ASSESSMENT, NO. 3.

Amount	Forty Cents per Share
Levied	July 9, 1881
Delinquent	August 12, 1881
Day of Sale	September 1, 1881

F. E. LUTY, Secretary.

Office—Room 5, No. 330 Pine St., San Francisco, Cal.

Arizona Mexican Mining Company—Lo-

cation of principal place of business, San Francisco, California. Location of works, Globe District, Arizona Territory.

NOTICE.—There are delinquent upon the following described stock, on account of assessment No 1, levied on the Seventh (7th) day of June, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amount
G R Johnson	180	40900	$24,950 00
O R Johnson, trustee	146	1000	500 00
O R Johnson, trustee	147	1000	500 00
O R Johnson, trustee	148	1000	500 00
G R Johnson, trustee	149	1 00	500 00
O R Johnson, trustee	150	1000	500 00
O R Johnson, trustee	151	1000	500 00
O R Johnson, trustee	152	1000	500 00
O R John on, trustee	153	1000	500 00
O R Johnson, trustee	154	1000	500 00
G R Johnson, trustee	155	1000	500 00
O R Johnson, trustee	156	500	250 00
O R Johnson, trustee	157	500	250 00
O R Johnson, trustee	158	500	250 00
O R Johnson, trustee	159	500	250 00
O R Johnson, trustee	160	500	250 00
O R Johnson, trustee	161	500	250 00
O R Johnson, trustee	162	500	250 00
O R Johnson, trustee	163	500	250 00
O R Johnson, trustee	164	500	250 00
O R Johnson, trustee	165	500	250 00
O R Johnson, trustee	166	500	250 00
O R Johnson, trustee	167	500	250 00
O R Johnson, trustee	168	500	250 00
O R Johnson, trustee	109	500	250 00
O R Johnson, trustee	170	500	250 00
G R Johnson, trustee	171	500	250 00
O R Johnson, trustee	172	500	250 00
O R Johnson, trustee	173	500	250 00
O R Johnson, trustee	174	500	250 00
O R Johnson, trustee	175	500	250 00
O R Johnson, tru tee	176	500	250 00
O R Johnson, trustee	177	500	250 00
Geo R Adams, trustee	12	500	250 00
Geo R Adams, trustee	13	500	250 00
Geo R Adams, trustes	14	500	250 00
Gso R Adams, trustee	53	100	50 00
Geo R Adams, trustee	54	100	50 00
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Geo R Adams, trustee	136	50	25 00
Geo R Adams, trustee	137	50	25 00
Geo R Adams, trustee	138	50	25 00
Geo R Adams, trustee	130	50	25 00
Geo R Adams, trustee	140	50	25 00
Geo R Adams, trustee	179	4000	2000 00
Geo R Adams, trustee	183	16650	8325 00

And in accordance with law, and an order of the Board of Directors made on the seventh (7th) day of June, 1881, so many shares of each parcel of such stock as may be necessary will be sold at Public Auction, at the office of the Company, room 30, No. 320 Sansome street, on Monday, the eighth (8th) day of August, 1881, at the hour of 12½ o'clock P. M., of said day, to pay said delinquent assessments thereon, together with costs of advertising and expenses of the sale.

GEO R ADAMS, Secretary.

Office—Room 30, No. 320 Sansome street., San Francisco, Cal.

Wolverine Gravel Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Roach Hill, Placer County, California.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 2, levied on the 31st day of May, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Barnett, Miss Ellen, Trustee	12	300	$30 00
Barnett, Miss Katie, Trustee	15	200	20 00
Barnett, Miss Katie, Trustee	72	100	10 00
Berry, J. H., Trustee	13	100	10 00
Dodge, L. C., Trustee	17	1,000	100 00
Dodge, L. C., Trustee	18	500	50 00
Durning, T. G., Trustee	30	500	50 00
Hall, Edward, Trustee	32	1,000	100 00
Hall, Edward, Trustee	33	1,000	100 00
Myers, W. H., Trustee	10	2,000	200 00
Moyer, Frank, Trustee	16	200	20 00
Moyer, Frank, Trustee	44	75	7 50
Moyer, Frank, Trustee	45	100	10 00
Moyer, Frank, Trustee	74	750	75 00
Mason, H. G., Trustee	21	1,000	100 00
Tilley, W. J., Trustee	39	2,000	200 00
Teel, J. M., Trustee	64	500	50 00
Teel, J. M., Trustee	65	250	25 00
Jones, Wm.	77	500	50 00

And in accordance with law, and an order of the Board of Directors, made on the 31st day of May, 1881, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, 325 Front St., San Francisco, Cal., on Monday, the First day of August, 1881, at the hour of Two o'clock, P. M., of said day, to pay Delinquent Assessments thereon, together with costs of advertising and expenses of the sale.

E. J. BLANDING, Secretary.

Office—325 Front St., San Francisco, Cal.

Steep Hollow Gold Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Liberty Hill Mining District, Nevada County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 21st day of June, 1881, an assessment (No. 6), of $1.50 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the Company, No. 310 Pine street, Rooms 15 and 17, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of July, 1881, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 18th day of August, 1881, to pay the delinquent assessment together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. W. PEW, Secretary.

Office—310 Pine St., Rooms 15 and 17, San Francisco, Cal

BUY LAND

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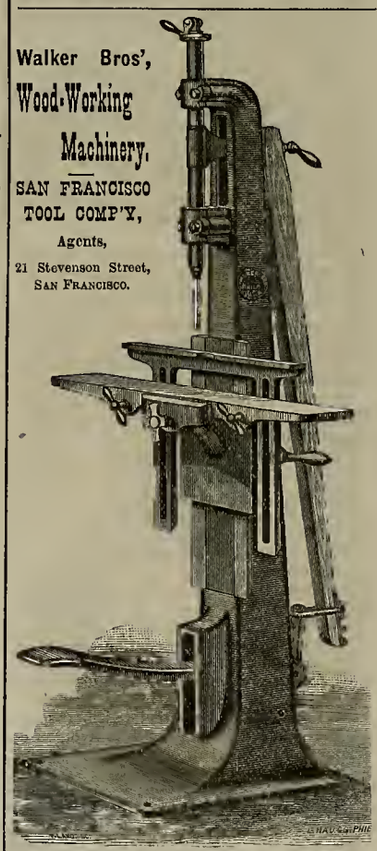

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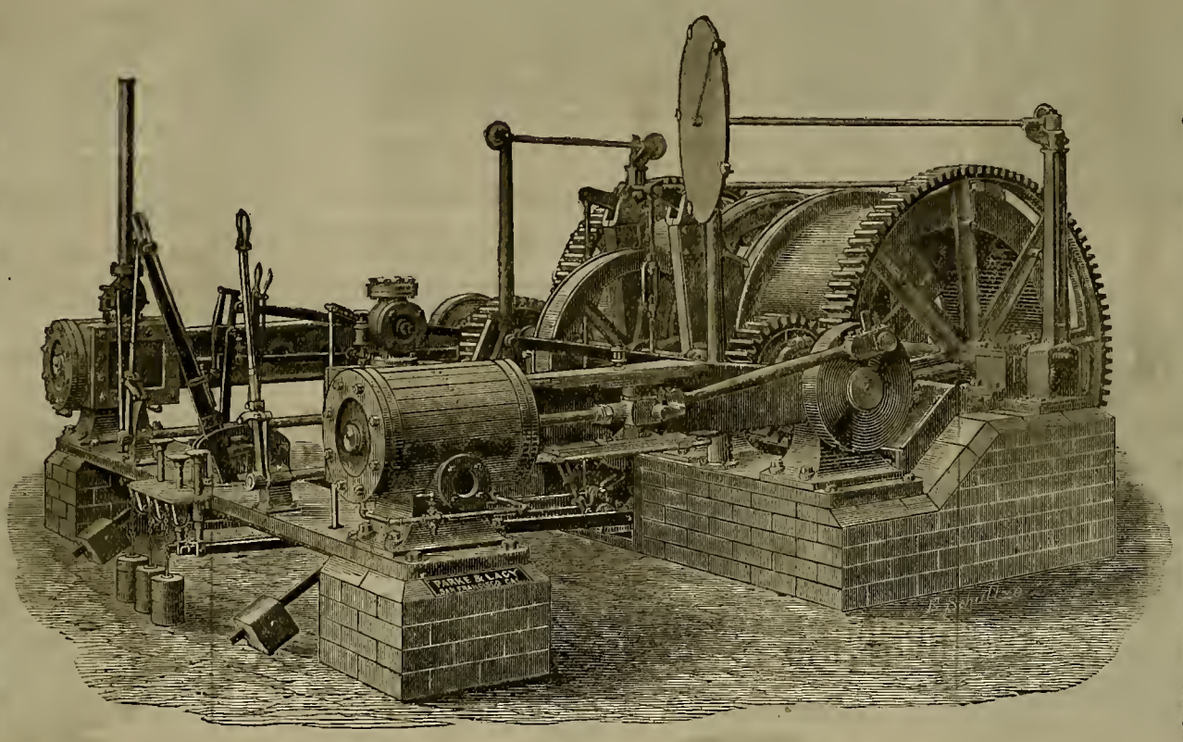

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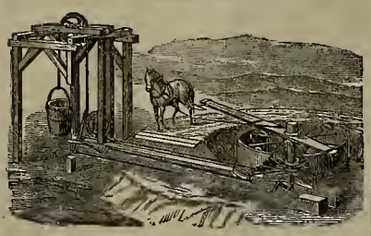

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MINING AND SCIENTIFIC PRESS.

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Safety Attachment for Mine Cages.

C. Douglas Brown, of Prescott, Arizona, has just patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an improvement in attachments for mining and other elevator cages, by which such cages are prevented from falling if the rope or anything else breaks. One of these attachments is now being made by Reynolds & Rix, 49 Fremont St., general agents for the Pacific coast, which will be placed on exhibition in working order at the Mechanics' fair.

Mr. Brown's device consists in the employment of inclined arms having their outer ends formed to engage and hold in the guide timbers between which the cage moves, while their inner ends are connected with a ring secured to a vertically sliding spindle or king-bolt having elliptic, spiral, or other springs to draw it down forcibly if the rope breaks, and thus cause the ends of the inclined arms to engage the guide timbers. As soon as these arms become engaged and fixed in the guides, the whole weight of the cage is transferred to the king-bolt, by which it is suspended, and through it a direct power is exerted to fix the arms in the guides independent of the spring. A sliding ring or sleeve upon the king-bolt below the attachment of the inclined arm is connected with them by stays or bracing arms, which cause both of the arms to be thrown out simultaneously, and equally prevents them from being thrown out too far by the shock, and assist in strengthening and bracing them.

The frame of the cage has clips which extend upon each side of the guide-timbers, where the safety-arms will engage them and thus prevent the timbers from being split by the arms when they are forced into the timbers. Rubber buffers or springs below the nut at the top of the king-bolt relieve the jar when it brings up on the catches, and the platform or floor may also be supported upon springs to relieve the force of the blow.

The engraving shows the timbers of the guide-frame of a cage-well such as is employed for hoisting purposes in mining shafts.

From these upper cross-timbers an angular frame extends upward, being bolted or otherwise fixed to the cage frame, and it serves to support a protecting roof, which protects the occupants of a cage from falling rubbish or a broken cable.

Through or between the cross-timbers, and through the roof of the cage, a king-bolt or spindle passes, having a vertical or end play, and being prevented from turning around by feathers fixed to it and moving in suitable slots or guides. To this king-bolt or spindle is fixed a sleeve, having projections at its opposite sides, to which the inner ends of the two safety arms or dogs are pinned. These two arms extend at an incline downward and outward through slots in the frame, so that their outer ends stand in line with the inner faces of the guide timbers (not shown), between which the cage moves. The ends of these arms are so formed that they will readily engage with or penetrate the guides when forced outward, and they will thus hold the cage supported from its spindle.

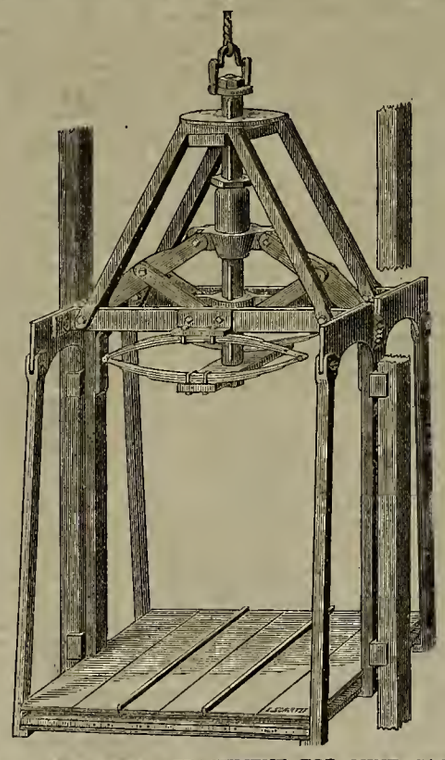
Below the timbers of the cage are secured springs, any kind. The spindle passes through or between the springs, and a strong plate with adjusting and holding nuts at the bottom retains it in place, and also enables the inventor to regulate the tension of the springs. A plate or head at the top of the spindle will serve as a stop when the spindle is drawn down by the spring, and an elastic buffer on the spindle relieves the jar when the cage is suddenly stopped.

A loose or sliding sleeve is fitted to slide upon a feather on the spindle below the fixed sleeve, and two arms extend from lugs on this sleeve to a point about midway in the length of the arms. These short arms, with their sliding sleeve, act together to hold the other arms, so that they will be thrown outward simultaneously, and will each engage its guide equally with the other, thus preventing any side strain.

Upon the sides of the cage, at top and bottom, are secured clips, which extend outward upon each side of the guide timbers, and thus insure the central position of the cage in the shaft. The upper clips are placed upon each side of the slots in the cage frame, through which the arms are projected into the guides, and as they project on each side of the guides, they will prevent the latter from being split and spread apart by the action of the dogs.

The floor of the cage has rails, upon which cars may be run to be elevated in the usual manner. The spaces at each side of and between the rails may be fitted with a false bottom, which rests upon springs, so that the shock of sudden stoppages of the cage will not be communicated so severely to the occupants of the cage.

THE YUBA DAM.—State Engineer Hall, who has just been on a visit to the Yuba debris dam, announces that he is satisfied that the dam will accomplish the purpose for which it was built. He states that only about 200 ft. of the 10,000



BROWN'S SAFETY ATTACHMENT FOR MINE CAGES.

ft. of the dam constructed in accordance with the original plan, were washed out last winter. The part which gave way most was earth work, hurriedly put in at the close of the season to complete the work. He says that he will make a report to the Governor, and that the report will probably be published in the course of a week. Col. Mendell will report to the War Department at Washington the result of the observations made under his direction.—*Nevada Transcript.*

IN speaking of the mines of San Diego county, a correspondent writes: "The mountain region between here and the desert is alive once more with miners. Work has been resumed on some of the Julian claims. The Washington, Rough-and-Ready, the Garden and the Hubbard are all showing well."

THE Howell furnace at Montezuma, under the management of Chief Smelter Thomas, formerly of Cerro Gordo, says the Inyo *Independent* of July 23d, completed its first run of 1,000 bars, and then went right on. It is a lively camp, working about 60 men. The only drawback is a scarcity of water, of a very bad quality at that.

The Richmond-Albion Decision.

An associated dispatch from Eureka says Judge Rives this morning rendered his decision in the case of Richmond versus the Albion, the result being an unequivocal victory for the Richmond company. The Judge holds the St. George patent to be absolutely void, the Uncle Sam claim is a good and valid location, and in fact every point contended for by the Albion as between the St. George patent and Uncle Sam location is found strictly and unequivocally in favor of the Albion. But the close of the decision is the surprising part. Among other paper titles put in by the Richmond was a patent called the Victoria. This patent was procured by the Richmond pending the protest suit between the St. George and Uncle Sam. It is a younger claim and a younger application for a patent than either the St. George or Uncle Sam. The Judge holds that it is a better title than that conferred by the prior application for the St. George ground. The Victoria patent was scarcely alluded to in the late trial. The Richmond made its big fight on the validity of the St. George patent, which has been thrown out as utterly worthless and void. The finding in favor of the Victoria will be a surprise to everybody, as it cut but an unimportant figure in the case during the trial. A stay of all proceedings will be granted for 30 or 60 days to allow the case to be taken up, and to prevent the destruction of the estate by either party. The decision occupies 30 pages of legal cap.

At the conclusion of the reading of the decision the Albion asked for an injunction covering the disputed premises in the other two cases pending between the same parties. The injunction was granted for the whole ground until the hearing of these cases. The Albion was required to file a bond in the sum of $10,000, which was immediately given.

IT is stated the Wood River Gold and Silver Mining Co. has leased the Morgan & White smelter, in Salt Lake City, to reduce the ores of the company's mines on Wood River.

Pillow Blocks for Mining Machinery Shafts.

In the class of bearings that are employed for heavy shafts, more particularly for mining machinery, it is customary to form vertical inclines upon the backs of the brasses, and wedges are fitted to move vertically up and down in a space behind the brasses to adjust them to or from the shaft as may be required. The objection to this method is that the wedges must necessarily be short (being limited by the depth of the side brasses), and their bearings are so small that the brasses are liable to twist on this account. They can also have but a short space for adjustment; and, lastly, as they must be adjusted by screws, which pass through a cap, these must be removed before the cap can be taken off, thus leaving the brasses unsupported, and the set of the shaft may thus be disturbed by the removal of its side supports.

To remedy these defects, Mr. Irving M. Scott, Superintendent of the Union Iron Works, has recently invented and patented through the MINING AND SCIENTIFIC PRESS Patent agency, a novel method of adjusting and regulating the set of bearing-brasses by the use of horizontally inclined wedges and faces with suitable actuating screws, all operating independently of the cap, which may thus be removed without disturbing the brasses or the set of the shaft.

In Mr. Scott's device the side brasses have flanges projecting at right angles from the ends, so as to fit the sides of the pillow-block, and thus hold the brasses in place. The backs of the brasses are formed in with an incline face, extending from end to end of the brass between the flanges.

Wedges are fitted into the space behind the brasses, lying horizontally and having holes formed in their ends with screw-threads to receive the horizontal screws, which, when turned, will cause the wedges to advance or recede. The shanks of the screws have collars which fit in spaces between the flanges of the brasses and a projection so that when turned the screw will not advance or recede, but will move the wedge. Instead of forming screw-threads in the ends of the wedges, as above described, recesses may be made to receive nuts, which will operate in the same manner. These wedges may be made of considerable length, on account of the width of the box, and they will thus support the brass for so great a distance that it will be very rigid and will not twist or get out of place. The space for adjustment is much longer, and, finally, as the adjusting screws pass in through the sides and are independent of the cap, the latter may be removed for inspection or other purposes without touching these screws or in any way disturbing the position of the brasses or the set of the shaft, which might otherwise get out of place.

REDUCTION WORKS IN NEW MEXICO.—The Albuquerque (N. M.) *Journal* says: It will be but a short time now before quite a number of smelters, stamp-mills and reduction works are in full operation in New Mexico. Cerrillos station has a smelter complete, except the roaster which is nearly ready. Ortiz station, near by, will have one running soon. At Bonanza City, the Duryee furnace and Gonzales Reduction Works are nearly ready to start. The Canyon del Agua Co. have a smelter nearly ready, and their extensive hydraulic system for placer washing will soon be in operation. At Socorro, several smelters and stamp-mills have been arranged for, and two or three are in course of construction. Another one is to be erected at Allamille, 12 miles north of Socorro. One is likely to be erected in the Oscuras, another near Las Cruces to work the ore from Oregon mountain. White Oaks has a smelter and concentrating works in immediate prospect. Silver City will have nearly 100 stamps in operation within the next four weeks.

PARTIES have located an iron mine on the mountain east of Rutherford, about a mile from the Whitton quicksilver mine. The locations, four in number, are each 60x1,500 ft., equal altogether to an area of 80 acres.

Mining Company Reports.

Savage Mine.

The annual meeting of the Savage Mining Co., held at the office of the company on the 21st, was a lively contest for the control of the mine. The cramped quarters in Nevada Block occupied by the company's office were crowded to discomfort with mining secretaries, brokers, stock operators, reporters, and others. The contest was between the factions known as the Hosflich, on the one side, and the Williams, on the other, the first being the inside and the latter the outside. Each side had its adherents present in full force.

Thomas H. Williams, President of the company, said that he had no written report to make, as all that it was necessary for the stockholder to know was contained in the reports of the secretary and superintendent, which would be presented to the meeting. The present management of the mine had endeavored to conduct its affairs honestly and economically. Some complaint had been made that operations had not been so conducted as to make the stock lively in the market. It was not his habit to make things lively without something to do it on, and that something had not been found in the Savage. Complaint had also been made at Virginia that the mine was not worked so as to give employment to a large number of miners. He was glad that one of the principal charges against his management was that it had not been extravagant. They had been waiting for several months for the result of the hydraulic pump experiment, and it afforded him pleasure to read a dispatch from Superintendent Regna. This dispatch stated that the pumps were running satisfactorily and that no machinery could run more smoothly.

The roll-call occupied about four hours, and there was considerable animated discussion at various stages of the call over rulings by the President.

At the election, the following Trustees were elected: Maurice Hoeflich, H. M. Levy, L. T. Lazure, J. B. Russel and Geo. I. Ives.

The new Board met and organized by electing the following officers: President, H. M. Levy; Secretary, Edward B. Holmes; Superintendent, R. P. Keating.

Following is an abstract of the report of the Superintendent, R. W. Chase: There has been nothing done during the past year toward freeing the mine from the water. The drift from the C. N. S. shaft to connect with our incline at 2400 level enconntered so strong a flow that it was considered unsafe to advance farther until the shaft company had better facilities for handling it. It was therefore decided to bulkhead the water and await the completion of the new hydraulic pumps. Following is a brief resume of work done in the mine: The lateral drift, 2400 level, from C. N. S. shaft, to intersect Savage incline, is in a total distance of 720 ft. One bulkhead was constructed 70 ft. from the face and one 36 ft. from the junction. There has also been one put in on the 2200 level to stop the flow of water into our incline, making three in all. These are of the strongest kind, being built of stone laid in cement. The general repairs to the mine have been of an extensive character. Owing to the heavy pressure of the ground, the shaft has heretofore required constant repairing. I have retimbered 500 ft. of it. The stations had been standing so long that the timbers were decayed and crushed in such a manner as to require them to be newly timbered. The incline for a distance of 1,200 ft. has been eased and a considerable portion of it retimbered. All necessary work has been done on the pumpbobs, pits, tanks, etc., as far down as the water would permit to put them in good condition for running. The prospecting has necessarily been somewhat limited, being confined to levels above the submerged portions of the mine, principally the 1300, 2000 and 2100. After completing all necessary repairs in the mine it was shut down until such time as the bulkheads could be opened, which will depend upon the working of the new hydraulic pumps. The surface machinery has been thoroughly overhauled and put in good condition. The shaft since shutting down the mine seems to stand exceedingly well.

Following is the report of the secretary, which was read at the meeting:

RECEIPTS.

Balance Supt's account, July 1, 1880	$59.60
Virginia & Truckee R. R. Co	4,752.87
Sutro Tunnel Co	227.00
Ores	948.67
Assessments	360,965.00
	$366,953.14

DISBURSEMENTS.

Cash balance, overdraft July 12, 1880	$67,710.03
Assaying	3.03
Exchange	750.59
Legal expense	2,020 00
Wood	22,466.45
Surveying	190.00
Cbollar, Norcross and Savage shaft	75,529.65
Materials and supplies	23,634.38
Books and stationery	334.90
Freight	363.85
Office expense	2,717.72
Labor and salary	$2,944.15
Water and ice	7,783.75
Incidental expense	1,030.79
Interest	1,983.74
Lumber and timber	8,050.00
Taxes	4,360.34
Savage-Norcross pumping	52,365.06
Combination drift, "2400"	2,877.67
Sutro Tunnel royalty	454.00
Balance Supt's accounts, July 1, 1881	51.71
Cash balance, July 18, 1881	9,166.36
	$366,953.14

The Yellow Jacket.

The annual report of Supt. Taylor, of the Yellow Jacket, is in brief as follows:

Owing to the accident to the pumping machinery, which occurred November 11th, but little work was done on the lower levels during the fiscal year ending June 30th. For nearly seven months the mine was flooded, the water rising as high as the 2250 level. While employed making the repairs to pump engine we opened a station at the Sutro tunnel level (1,513 ft. below the top of the shaft), and ran a drift northeast from the same 70 ft. to the proposed line of the Sutro tunnel, at which point we placed a switch and drifted north from the same 668 ft. to a connection with the south header of the Sutro tunnel. This drift was uniform in grade, size and construction, as per contract with the Sutro Tunnel Co. We also drifted south 75 ft. from this switch, making 743 ft. of the Sutro tunnel run by this company. A portion of this work was done in the ground of the Challenge Con. and Confidence mining companies. At the same time we placed a second line of 14-inch pumps from the 2828 level tank station to the Sutro tunnel level, thereby doubling our pumping capacity; also double strapped the upper portion of the pump-rod at all the joints. On the 16th of April, the Sutro Tunnel Co. having completed the drain boxes, we started the pumps and tanks to drain the mine. On account of the several connecting levels, we at the same time drained all the mines between the Bullion on the north and the Segregated Belcher on the south.

We were somewhat delayed in this work, caused by the slipping of the pole brackets of the 2800 and 3000 level pumps, which obliged us to get two 14-inch lift pumps and two steam pumps, with which we lowered the water and secured the poles. We pumped and hoisted 86,000,000 gallons, or 360,000 tons of water, before reaching the 3000 level on the 20th of June.

We have had since that time a steady flow of 60 miner's inches or 720 gallons per minute. About 20 inches of this quantity comes from the Crown Point and Belcher mines, and 33 inches from the Imperial group of mines; the balance or about 7 inches being the quantity of water our mine makes.

Work has been resumed on the lower levels. During the year 1,055 ft. of drifts were run, 743 ft. of the Sutro tunnel made and 980 ft. of prospect holes (on the 2700 level) bored with the diamond drill. Balance-hoh stations were excavated at the 1200 and 2150 levels, and bohs erected in the same.

The Overman.

At the annual meeting of the Overman last week the following directors were chosen for the ensuing year, all being re-elected: S. Heydenfeldt, Sr., R. F. Morrow, Joseph Clark, G. W. Beaver and R. Wegener.

At a subsequent meeting of the directors the following officers were re-elected: President, G. W. Beaver,; Vice-President, R. Wegener; Secretary, George D. Edwards, and Charles Forman Superintendent.

The president stated that no report had been submitted by the superintendent, but the secretary's report of the financial condition of the property was as follows:

DISBURSEMENTS.

Cash overdraft, July 1, 1880	$ 16,159.37
Advertising	693.00
Interest	704.00
Labor account	63,244.07
Wood	33,743.21
Lumber	3,562.38
Office expense	6,393.30
Hardware, etc	3,003.82
Powder and fuse	7,593.10
Candles and oil	3,248.96
Water and ice	4,860.21
Machinery and foundry	5,550.45
Miscellaneous supplies	3,178.21
Legal expense	1,338.89
Surveying	480.00
Discount	341.50
General expense	1,721.29
Formau shaft	60,799.30
Taxes	1,083.60
Chas. Forman, Supt., (balance July 1, 1881)	461.27
Cash on hand, July 1, 1881	2,430.95
Total	$229,593.68

RECEIPTS.

Assessment No. 46 (balance)	$ 54,673.50
" " 47	56,173.50
" " 48	56,173.50
" " 49	56,173.50
Chas. Forman, Supt., (balance July 1, 1880)	428.04
Suspense account	161.53
Ore sales	226.38
Supply sales	5,588.73
Total	$229,598.68

The Utah Mine.

At the annual meeting of the Utah mine the following directors were elected: R. H. Follis, John Skae, Geo. Wallace.

At a meeting of the newly-elected Board of Directors the following officers were elected: President, R. H. Follis; Vice-President, John Skas; Secretary, G. C. Pratt; Treasurer, Nevada bank; Superintendent, A. G. McKenzie.

Trial Balance.

Following is the trial balance for the year ending July 12, 1881:

Advertising	$ 550.00
Assaying	116.00
Books and stationery	97.85
General expense	1,763.10
Hauling	671.00
Transportation and hauling	1,412.86
Interest	1,064.05
Legal expenses	1,045.00
Virginia office expenses	723.34
Supplies	24,858.05
Salaries and wages	81,815.00
Surveying	150.00
Water and ice	4,319.35
Wood and timber	29,433.68
Real estate	603.25
Hospital and contribution	360.00
Overdraft of Supt., June account	7,714.85
Cash on hand	1,993.40
Total	$160,104.33
Assessment No. 31	$ 40,000.00
" " 32	40,000.00
" " 33	40,000.00
Nevada Bank	14,388.32
Loss and Gain	23,717.61
Total	$160,104.33

The report of Alex. G. McKenzie, Supt., is in brief as follows: The main incline has been sunk and timbered 530 ft., passing through a favorable foot-wall formation; alternating in its character and at times very hard. The bottom of the incline has now reached a point 25 ft. below the 2350 level. Sinking will be continued and pushed as rapidly as possible until the 2500 level is reached, when a drift will be started east to a connection with the north drift now being run from the Union Con. and Sierra Nevada mines. This work, when completed, will secure excellent ventilation and make development work possible in a large space of undeveloped country. There has been 1790 ft. of drift run in the mine during the past year showing nothing more valuable than a well defined vein formation which shows a very decided improvement in character as depth is acquired.

We are now engaged in repairing and cleaning out the old drifts on the 400 level, with a view to the further development of the mine at this point. Work on this level was necessarily abandoned some years ago, caused by the finding of heavy flows of water. This difficulty is now overcome through the benefit of the line of pipes laid from the mine to the Sutro tunnel.

All the machinery and everything appertaining to the mine is in first-class condition.

Advertisements and Adverse Claimants.

A Montana case, just decided in the General Land Office, presents some peculiar as well as interesting features. An application for patent was filed by the locator, and due notice of the same was given in the usual way, by publication, etc. It so happened that the printer, for his own convenience, attached to the advertisement, a notice that the advertisement expired on a certain day, which was several days after the legal limit in which adverse claimants could file their protests. An adverse claimant alleged that the note of the printer misled him, and that when he offered his papers at the local office, they could not be received because the time for filing an adverse claim had expired. Under these circumstances he appealed to the Commissioner, who sustained the decision of the local office, and says "that it is not the province of a published notice to inform adverse claimants at what period the time within which an adverse claim may be filed expires; but its office is to inform all interested, that an application for certain mineral land has been filed at a date named, and adverse claimants are therefore put upon inquiry." In other words, it is presumed that every claimant knows the law and must judge for himself when the time for filing expires, and must not be led astray by false lights, and therefore must suffer the consequences of his own negligence or ignorance, and the department can afford no remedy.

SHOT WITH A PIECE OF QUARTZ.—A singular accident occurred above Cherokee, on Thursday morning last, to a miner named Samuel Smith, who was working in the "Old Duffield claim," with Mr. F. B. Fowles. These men were developing the mine, Mr. Fowles working during the day, and Mr. Smith at night. About five o'clock, on Thursday morning, Mr. Fowles heard a blast in the direction of the mine, and at seven o'clock went to the mouth of the tunnel to resume his shift, and seeing no light, or hearing no noise thereabout, he hallooed the man's name in the tunnel several times. Getting no response he started to find out the cause, and after going some distance he stumbled upon the lifeless body of poor Smith. Fowles had him conveyed to a cabin near his residence, and sent for Coroner Van Harlingen. On examination there was found to be but one wound. A piece of quartz about one-half an inch one way, and one-fourth of an inch another, had broken through the center of his breast bone and imbedded itself in his heart, making a hole as if shot by a musket ball. From appearances of blood stains, he had walked about 15 ft. after being struck. The accident is accounted for in the supposition that the blast did not go off as soon as he expected, and went back to examine the cause, and when about 15 or 20 ft. from the place an explosion occurred and he was killed by the flying fragment. Mr. Smith was a native of Sweden, aged 59 years, and was highly respected by his brother miners and all who knew him.—*Tuolumne Independent.*

INTEREST in the mines along the Colorado river has been revived by the recent railroad surveys. Claims have been located at Cottonwood island, Hardyville, Mohavs, the Needles, Ehrenberg, the Colony and Castle Domes.

THE payment by the Ontario, of Utah, of its 69th dividend of $75,000 on the 15th inst., made a total of $3,575,000 thus far paid to its stockholders.

California.

California is a peculiar land in a peculiar clime. California is a problem yet unsolved. Some of the factors seem to be discerned; others are still out of sight. Intellectually eccentric, socially unripe, morally undefined, our future, as a people, is a puzzle to philosophers. Our plant life is a treasure-house of novelties to the botanist; our zoology from the fish in the wave, the mollusk on the shore, the insects that devastate orchard and field, defoliate the foot-hill oaks or hore the Sierra pine, is *terra incognita* to the naturalist. Our meteorology defies the prophet at whose call fifty millions Americans beyond the mountains, fly the coming storms. Our industry is a youth whose present growth foreshadows an Hercules in strength; a Proteus in range of accomplishment. With her sky unknown, her soil almost untried, her manufactures just born and her people determined and yet bewildered by the novelty of the conditions and materials which surround them, California is indeed a mystery to herself and to the world at large.

Such being, in very outline, our place among the things which are, it is little wonder that California is often misunderstood and sometimes misrepresented. Even those who know California best know her but in part; no single man knows California wholly, even in her present state. Passing the California chapters in the sciences which have hardly their introductory paragraphs written, there is no one who knows wholly the single branch of our industry known as California agriculture—a branch with a thousand twigs and unnumbered leaves. This fact should be borne in mind by the thousands abroad who are prone to judge of California by the reports of individual successes or failures which come to their eyes or ears. In believing either the good or evil things which are said of our State, it should be understood that good might be evil and evil good, if either were moved up or down a valley, from hillside to plain or from coast to mountain.

Occasionally there is a man with keen observation and wide grasp of deduction who, even during a short acquaintance with our State, appreciates our conditions and sets them forth in language fitting their character. Such a one is Bishop E. O. Haven, who, writing to an Eastern journal (the *Christian Advocate*), thus freely chats of California:

> California is the most mysterious of all the States I have yet seen; and I have traveled, more or less, in all but three. No brief description can give any adequate view of it. The encyclopedia pictures are, as usual, monotonous and cadaverous, while the sketches by travelers often fall into the error of representing the whole as like some little spot that happened for a time to fill this eye. California is full of contradictions. To those who wish to study it before seeing it we would recommend two precepts, namely: 1. Believe all that you read and hear about it. 2. Believe nothing that you read and hear about it; for all is probably true of some place, and nothing is true of a majority of the places. It is 700 miles long, north and south, and nearly 200 east and west—an immense nation of itself. It is a land of mountains, some perpetually snow-clad, and of valleys and plains, in most of which snow is never seen—except at a distance—a land, some of which is as barren as Sahara, and which yet could furnish several Egypts fully as fertile as the original valley of the Nile; a land of corn and honey and wine; of oranges, lemons, plums, apricots, peaches, almonds, and English walnuts and apples; of potatoes and beets, and squashes and melons; of treeless and grassless prairies and dense jungles, and shrubs and trees that began to grow before the times of Noah, and seem never to have found a stopping-place; a land of coal and silver and gold; of grizzly bears, coyotes and gophers, and of men and women from all parts of America and Europe, and not a small sprinkling from Asia. Take it for all in all, it seems about impossible to write what is not true about it. Still we will not try, but, as usual, endeavor to keep within the limits of fact.
>
> One can see at a glance that California has mountain ranges extending crookedly north and south, with valleys and plains of various width between them. These are crossed by numerous passes and river courses east and west. Over all blow the west winds from the ocean, dropping their showers on the valleys and plains, and their snows on the mountains in the winter, and their water on the mountains in the summer.
>
> Sometimes in your travels you will find yourselves sweeping over immense plains like those of Illinois and Texas, only not like the former in being actually boundless to view, nor like the latter in the border of forest trees, but terminating in mountains on one side clad in snow. These plains sometimes will be covered with fenceless wheatfields, the most prolific anywhere to be seen; in others, rimmed over by cattle; in others, arid and useless; in others, broken into numberless orchards of every kind, and small farms; in others, covered with patches of forest; in others, narrowed down into valleys; in others, broken into hills and vales. The kind of agriculture suited to one place would be utterly useless in another.
>
> Thus, California, with its usual variety of soil, becomes just about the most mixed up and infinitely various country of its size probably anywhere on the round earth. It is most of all like ancient Palestine, the Holy Land, only it is more than 50 times as large! Think of that—material enough to make 50 Palestines, and yet the one Palestine is giving character to the world! California ought to be able by and by to govern at least 50 continents.

We have indulged in a long quotation. We could not make it less, nor would we either, for these are facts which should be prominently set before the world. And if it be added that what Bishop Haven has written with chief reference to our agricultural conditions could be as well said, though in different words, of the varied character and development of all our resources and all our industries, the one who seeks to know California from a perusal of recorded facts or from a flying visit, may appreciate the problem which he attacks. California is great and is destined to be greater far. The tendencies now exerting their full force upon our people are of a most salutary kind. There has been a wonderful sweeping away of fallacies during the last few months and years. The real is putting to flight the unreal at every point. The shoutings of the demagogues have sunk to hoarse whispers and a hush people no longer listen. The fever for speculation has run its course, and the large on paper has been broken up into a thousand bttles.

Mechanical Progress.

Buying Second-hand Machinery.

Persons buying second-baad machinery either to sell again or for their nwn nse bavo need to ook carefully to all parts, so as to hs sure that they ars getting what they bargain for. It often occurs tbat good tools can be obtaiaed at a reduction from first cost; it also often bappens that ingenious persons paint and putty up an old lathe, or planer, or a steam sngine that bas seen its best days, and is worthless for anytbing else but to sell.

In buying a second-hand steam engins the cylinder and steam-cbest covers should be taken off aad ths parts examined to see if they are in proper coaditioa. Ths cylinder may requiro rehoring to make it true and smootb, and tbe expense of this job should he taken into accounr in estimating the valne. The valve-face may require refitting and the valvs also, and tbis must be taken into account. The bearings must he examined to sse if the brasses are not entirely worn out, and backed up with "sbims" so as to make them answer the purpose. The bed-plats must bs looksd at to scs if it is not crackod in an important part, and the bolts and nuts under constant use to sso if tbsir throads are not stripped or worn out. Whatever heater is used on tho engins it mnst bs thoroughly overhanlod to ascertain tbs condition of its tubes. In many cases tbsy are nearly rusted out, particularly if tbe enginc has been standing some tims without nss. Ths fesd-pnmp will also bear iaspection as to its valves and the condition of them.

All the valves will need examination for tbs condition of their seats.

In buying lathes ths cone-pulley bearing on the spiadle should be examined, also ths lead-scrsw near tbe head stock, the shsars, and tbe slide-rest. All the refitting required on these parts sbould bs estimatsd in purchasing a machias. Wherever thers ars trains or gears with latbes tbe sams sbould he exsminsd to see if tbey aro not broken as to their teeth.

Screw-cuttiag machines should be looked at as regards the dies; if ths latter are worn ont ons of ths most expensive details of that class of machines is destroyed. Planing machiaes sbonld ho examined in the gearing and in the slides, botb on the bed and tahlo, and cross-bsad. Some planers tbat bave boen nsed on spscial work are fit for no other until overhauled, for tbe reason that tbey are worn tbe most in particular places.

Cracks in frames are easily detscted by sounding with a hammer. If tbe casting is sound it will riag, but if cracked it is not sonorons.—*The Mechanical Engineer.*

The Proper Use of Iron in Building.—In a paper recently read on "Ths Proper Uss of Iron for Building Purposss," by Mr. E. T. Bsllhouse, of Manchester, the author remarked: One clsss of error occasionally committed by designers not tboroughly versed in iron construction shonld he specially avoided. I bave seen a rigid cast iron beam, in one pieca, resting at each snd upon tbe main walls of tbe building, supported in the center by a column. If tbsre should bs any sattlement or sinkiag in the foundation of walls, or of one of them, and the pillar stone sbould remain firm, ths beam would have its back broken over tbe column. If, on the other hand, tbe pillar foundation gave way, and ths walls remained firm, the superincombent weight would, in all probability, bs too much for tho beam to bsar. In such a cass tbere should bave heen two castings, witb such a joint ovar tbe column as to admit of a slight deviation from the horizontal liae, if any sucbs bould occur. In using wrought iron beams—as in the cass of timber—the elasticity of tha material will admit of considerable deflection without any danger, so no special provision need be made for ths contingency. We may add that ws bave seen in a very large structurs cast iron employed in tension, and wrougbt iron in compression. Needless to say, tbis was in accordance with an architect's specification.

Steel Boilers in France.—If we may judge from a recent discussion at a meeting of the *Societe des Ingenieurs Civils*, steel appears to he making slow progress in France as a material for stationary boilers. On the 20th ultimo an interesting paper was read before the above-named society, hy M. Jourdian, on boiler inspection associations; and, in the course of the discussion which followed, the author was asked hy the president as to the extent to which steel appeared to bave a tendency to replace iron as a material for boilers. In reply to this inquiry M. Jourdain statod that a certain number of makers were employing steel plates for parts directly exposed to the fire, but that *he did not know of any stationary boiler constructed entirely of steel.* As M. Jourdian is in a position to he well acquainted with French practice, we can only conclude that our neighbors across the channel are greatly behind us as far as the general use of steel is concerned. This is the more to he wondered at, as the steel plates turned out at Creusot, and at some other French works, are of an admirable quality. In tbis country stationary boilers of steel are now to he counted hy hundreds, and we have little doubt that before many years are over, the same will he the case in France.—*London Engineering, June 10th.*

The Strength of Small Spruce Beams.

Mr. F. E. Kidder bas recently performed a ssries of experiments at the Massachussetts Institute of Tecbnology, having for their object tho detormination of the moduli of elasticity and of ruptnre in small bsams of whits spruce (*Abiealba*), aud such other information as might hs derived from the data obtained. The results of tbese researches are embodied in a paper rsad beforo tbe American Academy of Arts aad Sciencss, aad printed in the current number of the *Journal of the Franklin Institute.* Tho conclusions drawn from the results of ths experiments are as follows: Tbs modulus of elasticity depeads not only upon tbs elasticity of tbe matsrial, but also upon tbo lengtb of tims tbat the losd is applied. When subjected to loads not exceediag ono-sixth of tbe breaking weight, sprnce beams do not take a permanent set; but sven under very small loads, if applied for any lengtb of time, tbers will be a temporary set. Knots and gnarls in beams loaded at the center, when not witbin one-sigbtb of the span of tho center of tho beam, do not materially affect tbo olasticity under small loads. Deflection is vary nsarly proportioaal to the load, far beyond tho customary limits of the strain, and tbe modulus is consequently very nearly constant for all moderate deflections. A high modnlus of elasticity does not always accompany bigh transverse strsagtb. In sprucs bsams tbe upper fibers begin to rupture hy compression under about four-fifths of tho hreaking weight, and ths neutral axis, at tbs time of rupture, is vary near the cantsr of the beam, as sbown hy tbe fracture. Beams which are subjected to severe strains for a loag tims, bend more before brsaking than tbose whicb sre broken in a comparatively short time. Tbe modulus of elasticity of small spruce beams, of a quality sucb as is nsed in ths hast buildings, may be taksn at from 1,600,000 to 1,700,000 lbs., and the modulus of rupture at 11,000 lbs.

The Shop Foreman.—It would ssem, at first glancs, tbat a shop foreman should bs the best general workman in tbe establishment, and this is undoubtedly desirabls if one can bs found with ths otber qualifications nscessary to a good forsman; but this is not often tbs case. Lst us see what combination of qualities tbe best general workman must possess to make bim eligible as a foreman.

Hs must be a soher man wbo makes six days a wsek. He should have tbe confidsnce of bis smployers and tbe respect of the workmen. Hs should know bow to manage as well as to command men. He must bs ahle, in the shop at least, to entirsly divest himsslf among the men of his old standard as a workman. Hs must bs strictly impartial, and have tbe tact to find out the best way to get along with tbs men he has, and not tbose he would liks to have. He must bs ahle to plan ahead, bave a good memory, a quick perception, ho a rigid disciplinarian, and possess sound judgment; and because thess qualifications are not oftan combined in tbe hest workmen, is tbe reason why such a man is not always mads forsman, and why the foreman is not always tbe best workman of the shop.—*Mechanical Engineer.*

A Plastic Metal.—In England a very ussful material bas heen brought out which, under the name of "J. Richards' Plastic Metal," is heing mads hy tbe J. Richards Plastic Metal Co., of Cbarlotte street, Birmingham. In general outward appearance it resembles some of tbe other varieties of wbite mstal so largsly usad for lining bearings, but it has a remarkably close, hard texturs and takes a good polish. Its special feature, however, is its great affinity for othar metals, this afinity enabling it to be readily "pasted on" with a plumber's soldering irou, it heing impossihle when it is thus attachsd to remove it hy abrasive force. As it fuses at about 450° F., it can bs readily meltsd in an iron ladle ovar an ordinary fira, while it is stated that it contains neither lead nor spclter, and that it is not deteriorated by re-melting. The oasa with which it can he applied renders this mstal peculiarly applicable for effecting rcpairs in the colonies, etc., whers casting fnrnaces are not available.

Temperature of Least Resistance in Steel.—It is well known that a steel tbat is very flexible when cold, breaks at tbe blue annealing temperature. It has generally hoen considered that the purer the iron is the less subject it hecomes to this defect, hut the workmen of the Ural mountains, wbo use irons of remarkable purity, have often observed the same fact. Mr. Adamson has found that the metal hecomes powdery at a temperature hetween 260° and 370° C. (500° and 698° F.), or the temperature at which willow twigs take fire. This phenomenon seems to explain a large nnmher of accideuts, as for oxample the breaking of tires under the action of breaks, and the fracture of rivcted molds and of machine arbors which become heated by friction.—*Ann. du Gen. Civ.*

Increasing Use of Steel.—Dr. Siemens claims that whenever strength and magnitude are hoth required the uso of steel is without a rival. He asserts that even for an ordinary house, steel gives more security than wood, is six to cight times as strong and costs less. He thinks that ere the lapse of many yeara steel will be introduced into huildings of all kinds, and that it will gradually supplant iron in the same way that iron already tends to take tbe place of wood.

Scientific Progress.

The Comet.

Ths comet wbose appearance has attracted so much attention during ths past fow weaks, bas also heen tbo subject of mnch scisntific study, both in this country and in Europe. Thougb loss brilliant than some wbicb have appeared to tho prssnt generation, it has novsrtheless been more intorcsting and important, in a scientific point of view, than any of its recent predecessors. In our last woek's issue, wo gavs tbe results of Prof. Davidson's examination of the stranger from his observatory in tbis city. It will probably he some tims bofore we shall get ths results of Eastern and European obssrvations in calculating tbe elements of the comet. When first obssrved, it was about 70,000,000 miles from tbe sun and receding at the rato of 1,000,000 miles a day. It was at tbe same time about 30,000,000 miles from tbe cartb. The nucleus at that tims was estimated to be about 1,200 miles in diameter, witb a tail 40,000,000 miles long. Ths semi-circular envelope or haze abont the head was cstimatcd to be about 14,000 miles across. Tha comat was photographed hy Dr. Draper, of New York, on several succeeding nights. The same gentleman has also made it a careful stndy hy msans of the spectroscons. He announces tbat tbe nucleus gave a continuous spsctrum, indicating it to bs a solid or liquid body heated to incsndescsnce. Ths snvslope about tbe bead gave a spectrum indicating the presence of carbon in a gassous form. The spectroscope appoared to indicate that tbe tail shone hy its own, and not a reflected ligbt—tbat it was mads up of great numbars of separats solid or liquid particles in a stats of incandescsnce.

On the strength of these observations, Dr. Draper sxpressss the belief tbat the nuolsus is composed of mineral snbstances, partly, perhaps, of olivine, wbich is an ingredisnt of meteorites, aad of some volatile olement which yields to tbe influence of heat. As tbe comet approaches the sun, the volatile part is turned into gas by ths beat, and flames out to form the coma. Tbe fact that the coma is always on the sunward sids of tbs nuclsus strengthens this supposition. But aftsr bursting fortb on ths side toward the sun, tbe vapor seems to hs repelled, and, losing its gaseous form, to strsam away from tbe sun as a solid or liquid, thus forming the tail. Tbe canse of this repulsion cannot be absolutely asserted; hut in all probability electricity bas something to do witb it.

New Theory of the Production of Steel from Wrought Iron.

Tbs formation of steel from wrought iron by the so-called cementation process has attracted much attention from cbemists in regard to tbe mstbod of action involved. In tbis process tbe bars of wrought iron are beated in contact with powdered charcoal to a high tampsraturs, and although neither iron nor charcoal approaches fusion, yst gradually a oombination of the iron with tbe cbarcoal takes plaos, resulting in tbe production of the stesl. The qnsstion as to how the action takes place bas hean answered by ths usually acceptod tbeory, tbat in this case a small amount of air is always present, and its oxygen unites witb tbe obarcoal, forming a gassous oxide of carbon, which then permeates ths heated iron, and is then decomposed, giving up its carbon to tbe iron, and sstting free ths oxygen, wbich again in time unites witb more carhon, and the process is repeatsd. On ths basis of certain expariments, an Englisb chemist has advanced a new thenry of tbe chsmical process involved, namely, that the beated iron becomes permsable to an impalpable charcoal dust, and that the union hetwesn iron an cbarcoal is hencs direct. He finds by experimsnt tbat wben charcoal, in the form of a powder, is heated in porcelain crucibles at a high tamperature, hut helow the melting temperaturs of porcelain, ths coal penetrates ths porcelain, and can hs detactad with tho microscope. He thinks that ths sams takes plaos with the hsated iron, and that this is sufficient to explain the procoss, without the assumption of the chemical reactions necessary to the first-mentioned and older theory.—*Californian.*

An Interesting Property of Gutta Percha. Prof. Frederick Kick, of Prague, calls attention to an iuteresting, hut little known property of gutta percha. It is well known tbat it hecomes plastic in water of 60° to 70° C., and can then he usod for making the finest imprints. It is less generally known, however, that soft gutta percha is elastic when exposed to shocks, and is capable of hearing, without alteration of form, hlows of a hammer or heing thrown against a wall. This peculiar property, which other plastic bodies, too, appear to possess in a dogree, is due to air inclosed in them, which Prof. Kick has provcd hy direct experiment.

Coating Copper with Iron.—The *Maschinen-Constructeur* says that Prof. Boettger recommends the following solution for coatiug copper plates with iron. Ten parts of ferrn-cyanide of potassium and 20 parts of tartrate of soda dissolved in 220 parts of distilled water, adding a solution of 3 parts of sulphate of iron in 50 parts of water. Caustic soda solution is then poured into the mixture until the Prussian hlue formed is re-dissolved.

Heating Effects Due to Compression.

On two former occasions we have taken notice, says London *Engineering*, of the rssults of certain invsstigations instituted hy Prof. P. G. Tait, of the University of Edinburg, in rogard to tbe thermometers used in tbo Challsngsr expedition, and the allsged effects of compression upon tbem when immersed to great daptbs in tbo sea. Still pursuing tbe line of inquiry sug-gested by tbs sxpsriments made with tbese thermometers, ths learned professor bas since made a further series of experiments on tbe heating effects of compression of a number of liquids and semi-solid liquids, tbe rssults of wbicb be laid before tbe Royal Society of Edinburg on tbe evening of Monday, tho 16th ult. He mentioned tbat hs had employed a ton pressure upon each of a numbsr of differsnt substanoes, and had noticed in eaoh case tbe rise of temperature due to tbe compression exerted.

Marine glue gave a riso of temperature to tho extsnt of 0.9° Fabr.; raw potato, 0.7°; pith, 0.37°; cork, 1.3°; a pisce of bar soap, about 1.20°; a piece of licorice and a piecs of cbeese, about $\frac{3}{4}$°; a pieco of raw flesh bebaved very much liks the potato; India rubber and solid paraffino ross in tcmpsratnre about $1\frac{1}{2}$°; litbographor's ink and sboemaker's and hsswax, about 1.4°; lard, about 2°. After mantioning thess details, Prof. Tait said it was remarkable that potato and raw flesh, with so large a percentage composition of water, had a large comparativs amount of independent heat produced, wbile pith gave no parceptible difference of affect over what would bave besn produced by water alono. Cork has this peculiarity, namely, tbat wben ths pressnre was removed tbe fall of beat was only 0.9° Fabr., as against 1.3° of a rise on the application of the same amount of pressnre. That assmed to agres, he said, with what was already known of cork, namsly, that on the removal of the pressure it did not spring baok tn its origiaal form. In these rspects, India rnbbsr was opposed to cork, wbicb had tbis further peculiarity, that, on continued expsrimant, tbs amount of heat produced by tbs pressure gradnally fell till it was the same as tbe amount of cooling wbich resultsd on the relaxation nf the pressure. About sboemaker's wax there was the pocnliarity tbat it took a very long time before the hsating effect was fully produced. Its cbemical composition, also, was of conrse different from that of heeswax, which yet had precisely the same amount of heat produced. In concluding his interesting communication, Prof. Tait intimated that furtber research would bs nscessary hefore they could gat dsfinite facts showing the sxact heating effects of compression, whicb, he added, would form the subject of future communication.

The Acid of Fungi.

A great numbsr of fungi bave been found to present an acid rsaction to blue litmus papsr, and it has occurrad to Messrs. Hamlet and Plowright to ascertain wbat free acid or acid salt was so widely distributed in this family of plants. Long ago chemists have discovored tbat oxalic acid exists sithsr as oxalats of potash or oxalats of limsin many fungi and lichens, and oxalic acid has for soms time past bean looked upon hy many as a common coastituent of fungi. The authors' researches appear to confirm tbis view. In sevsral cases of common frogstools which were found to producs an acid rsaction to litmus paper, the test for oxalic acid showed its prssence in the juice of these cryptogamic plants. Tbis was more particularly noticeable in *Fistulina hepatica*, which yields 86.12% of water and contains 0.08% of oxalic acid, 0.15% of fat, 2.03% of cellulose, and 0.08% of ash. An examination of a great numbsr of species of mature fuagi helongiag to tbe genera *agaricus, boletus, peziza, polyporus, cantharellus*, etc., have lad the autbors to the conclusion tbat all maturs non-microscopic fungi contain oxalic acid, either free or combined.

We know tbat oxalate of lime has been dstected in sseral kinds of lichens, *variolaria*, etc., hut ws know also that sevsral other most interesting and important acids have besn also discovered in lichens; thersfors we regrst that ths authors ahovs named have not carried out a more extensive investigation in order to prove the existence or not of other acids than the oxalic in the great tribe of fungi. We find nothing in their paper to indicate that any snch rssearch has heen undertaken, and until such is tbe case it will he premature to attribute the acidity of fungi solely to the presence of oxalic acid.—*London Monthly Mag.*

The Possible Source of Coal Oil.—The original source and formation of coal oil is one of tho questions that has long agitated the scientific world. Among the many theories given is the following lately put forth by Prof. Mendeljeff who thinks that, on tho first formation of the earth, vast reservoirs of inorganic iron and carbon existed in the interior of the globe. These were reached hy the water condensing on the newly-formed land percolating hsneath its surface. The heat dccomposed the water into its component parts, oxygen and hydrogen, the first forming with the iron, oxide of iron, the latter with the carbon, petroleum and other hydro-carbons. If tbis theory he the correct ono, there still exists in the center of the earth reservoirs of petroleum that are to the sources as yet known as the ocean is to the spring whose waters finally find a restiug place in its bosom.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 7.		Week Ending July 14		Week Ending July 21		Week Ending July 28	
Alpha	3.10	3	2.85	2¼	3⅜	2⅜	3.85	3.60
Alta	4½	3.90	4.15	3.55	4.20	3.85	4.65	4.10
Andes	1.90	1⅛	1.55	1.15	1.55	1.30	1.55	1.40
Ahtteu	3.95	3	3.35	3.45	4.05	3.10	3.45	1.65
Argenta	10c	....	10c	5c	10c	5c	10c	....
Addenda	25c	....	15c	....	15c	10c	15c	10c
Belcher	3.35	2.65	3	2.65	3.15	2.70	3.15	2.80
Belmont	....	....	....	....	....	....	50c	....
Best & Belcher	11⅜	9⅛	10	8⅛	10½	9	11⅛	9⅞
Bullion	1.40	1	95c	75c	95c	60c	60c	50c
Bechtel	2	1.85	1.80	1.30	1.80	1⅛	1.80	1.70
Bel Isle	....	....	25c	....	....	....	....	....
Bodic	7⅞	7	7⅛	6¼	7	6¼	7⅛	6⅝
Benton	1.10	1	....	90c	1.05	75c	1.15	1
Bulwer	2.60	....	2.60	2⅛	3	2.80	2.80	2.70
Boston	....	....	50c	....	....	....	40c	....
Black Hawk	15c	....	20c	15c	15c	10c	10c	....
Belvidere	....	....	50c	....	....	....	....	....
Booker	20c	....	5c	....	....	....	....	....
Caledonia	25c	....	20c	....	15c	....	20c	....
California	1.20	75c	80c	65c	80c	70c	80c	70c
Challenge	1	85c	85c	....	90c	....	....	....
Chollar	2.80	2	2.30	2	2.30	2.05	2⅛	2.15
Confidence	4	....	....	....	3.85	3.80	3.90	3.60
Con Imperial	20c	10c	20c	15c	15c	10c	15c	10c
Con Virginia	2⅜	2	2.15	1.70	2.10	1.85	2.20	1.95
Crown Point	2.45	2.05	2¼	1.95	2.15	1.95	2.15	2
Columbus	....	....	40c	....	....	....	....	....
Champion	....	....	15c	....	25c	....	....	....
Concordia	90c	....	75c	35c	....	....	....	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	65c	20c	60c	40c	30c	25c
Derbec	....	....	....	....	....	....	....	....
Day	1.80	1.55	2.15	1.70	2.40	1.90	2.45	2.15
E. Mt. Diablo	....	....	15c	10c	15c	....	15c	10c
Eureka Con	31	....	32	31	31	30⅛	31½	29½
Exchequer	1⅛	1.10	1.15	1.05	1.15	95c	1.40	1.10
Endowment	....	....	....	....	....	....	....	....
Grand Prize	40c	....	45c	25c	40c	35c	30c	25c
Golden Gate	....	....	2¼	....	2.80	2¼	2.60	2⅛
Goodshaw	....	....	35c	30c	35c	....	75c	40c
Gould & Curry	5⅛	4.30	4.85	4.35	4.80	4.20	5⅛	4.60
Hale & Norcross	4	3.20	3¾	3.20	3.45	3	3.45	3.15
Head Carter	1⅞	....	1⅛	1.20	90c	....	85c	80c
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	10c	....	....	....
Julia	55c	45c	45c	35c	45c	35c	40c	35c
Justice	1.10	90c	90c	75c	95c	85c	1	70c
Jackson	30c	....	30c	....	....	....	50c	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	3	2⅛	3⅛	2⅛	2.65	2⅛	2⅞	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	25c	....	20c	....	25c	15c	25c	15c
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	10c	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2⅛	1⅛	2⅛	....	2.70	....	2⅛	....
Martin White	....	....	....	....	30c	....	....	....
McClinton	....	....	....	....	....	....	....	....
Mono	3.05	....	3⅛	3.05	3⅛	3	3.05	3
Mexican	9⅞	7⅛	7⅞	6⅜	7⅞	6⅞	7⅞	7⅜
Mt. Diablo	8⅜	....	8⅜	8⅛	8⅜	7⅛	7	5⅜
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	95c	85c	95c	80c	90c	55c	90c	55c
New York	....	....	....	....	15c	....	5c	....
Northern Belle	19⅛	....	19⅛	18⅞	18	17⅛	17	16⅛
North Noonday	50c	....	40c	20c	30c	20c	25c	10c
Navajo	65c	60c	50c	....	30c	75c	1	80c
Occidental	1.40	....	1.20	1.05	1.30	1.20	1.35	1.30
Ophir	6⅛	5⅞	5⅞	5	5⅞	5⅜	5⅞	5⅜
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.70	1.55	1.45	1.15	1.35	1.05	1.40	1.15
Oro	1.10	95c	90c	70c	80c	65c	80c	70c
Paris	....	....	....	....	....	....	....	....
Potosi	3⅛	2.20	2.55	2.15	2.70	2.35	2.90	2.60
Queen Bee	5c	....	....	....	....	....	....	....
South Bulwer	....	....	35c	....	....	....	....	....
Savage	3	2.45	3	2⅛	3.05	2.40	2.85	2.55
Seg Belcher	....	....	....	....	6⅝	....	7	....
Sierra Nevada	11⅛	8⅛	9⅛	8⅛	9⅛	8⅛	9⅛	9
Silver Hill	30c	....	25c	20c	20c	15c	20c	15c
Silver King	22	....	21⅞	21⅞	21⅛	20	21⅞	21⅛
Succor	....	....	....	....	....	....	....	....
Summit	....	....	30c	....	25c	....	....	....
Scorpion	1⅛	1.20	1.20	1	1.20	1.10	1.15	1.10
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	10c	....	....	....	5c	....	5c	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	30c	25c	40c	35c	40c	25c	40c	30c
Tioga Con	60c	....	55c	50c	40c	....	40c	35c
Tiptop	4	3.90	4.95	4⅛	4.90	4.80	5⅛	4.95
Tuscarora	....	....	....	....	....	....	....	....
Union Con	12⅜	9	10	8⅞	10⅛	8⅞	10⅛	9⅛
Utah	8⅛	7	7⅞	6⅛	6⅞	6	7	6⅛
Ward	2⅜	....	....	....	....	....	....	....
Wales	1.65	1.60	1⅛	1	1⅛	1	1.05	1
Yellow Jacket	5⅛	4.60	4.80	4.10	4.65	4.15	4.70	4.30

Sales at S. F. Stock Exchange.

Thursday A.M., July 28.

390	Scorpion	1.10@1.15	
20	Aipna	3.80	
500	Silver Hill	20c	
390	Alta	4.40@4.30	
30	Utah	6⅞@6⅜	
370	Belcher	3.05@3	
150	Union	9⅛@9¼	
140	Andes	1.45	
200	B & Belcher	11⅛	

AFTERNOON SESSION.

20	Bullion	60@55c	
600	Alhion	1.85@1.80	
625	Benton	1.05@1	
95	Argenta	50	
705	California	75@70c	
30	Bodie	6⅞	
715	Con Virginia	2.15@2.20	
100	Bodie Tunnel	2.55	
90	Chollar	2.30	
10	Bulwer	2.65	
250	Brown Point	2.05	
200	Bechtel	1.80	
350	Con Imperial	15c	
2100	Day	2.40@2⅛	
100	Caledonia	20c	
100	E Mt Diablo	15c	
180	Exchequer	1.20@1⅛	
100	Holmes	35c	
250	Gould & Curry	5⅛	
200	Head Center	95c	
30	Golden Gate	2.60	
100	Mono	2.90	
100	Hale & Nor	3⅛	
605	Noonday	55@50c	
200	Justice	10c	
350	N Noonday	10c	
100	Julia	40c	
165	Northern Belle	17	
10	Kentuck	2⅜	
900	Navajo	75c	
50	Lady Wash	20c	
100	Oro	65c	
370	Mexican	7⅛	
50	Star	50c	
70	Ophir	5⅜	
100	S Bulwer	10c	
120	Overman	1.35@1.30	
590	Syndicate	35c	
130	Potosi	2.80	
150	Tioga Con	40c	
10	Sierra Nevada	9⅛	
500	University	10c	
100	Savage	2.80	
100	Wales	1	

THE Esmeralda *Herald* says: There have arrived here some 1,000 tons of steel rails for the Bodie aud Mono lake railroad, and 2,000 tons more are to arrive, besides the rolling-stock and other material, which will aggregate about 5,000 tons to he shipped from this point.

By the carelessness of a Chinaman, a fire broke out in Dr. Cothran's grain fields, two and a half miles from Hollister, Thursday afternoon. Some 7,500 hags of grain were destroyed; also, 120 acres of standing grain and 75 tons of hay. The loss is estimated at $2,500.

LAST Tuesday afternoon, a 13-year-old son of Daniel Dewitt, who lives on Dry creek, seven miles from Walla Walla, W. T., was fonnd in the creek, dead, and as he was naked and subject to fits, it is supposed he went swimming aud fell in the water and drowned.

THE N. Y. Smelting and Sampling Co. are to put up smelting and sampling works at Wood River, Idaho.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Aurora M Co	California	3	10 July 5	Aug 6	Aug 31	P Conklin	535 Market st
Addenda M Co	California	5	10 July 11	Aug 17	Sept 6	T H Dixon	238 Montgomery st
Alpha Con M Co	California	14	1 00 June 20	July 25	Aug 15	W Willis	309 Montgomery st
Argenta M Co	Nevada	8	10 July 7	Aug 11	Sept 2	E M Hall	327 Pine st
Bullion M Co	Nevada	20	60 July 21	Aug 25	Sept 15	J M Brazell	328 Montgomery st
Belmont M Co	Nevada	29	15 July 27	Aug 30	Sept 26	J W Pew	310 Pine st
Belle Isle M Co	Nevada	2	15 June 3	July 11	Aug 2	E M Hall	327 Pine st
Best & Belcher M Co	Nevada	21	50 July 12	Aug 16	Sept 7	W Willis	309 Montgomery st
Caledonia M Co	Nevada	36	25 July 7	Aug 11	Aug 31	R Wegener	414 California st
California M Co	Washoe	1	30 June 30	Aug 6	Aug 25	C P Gordon	309 Montgomery st
Con Pacific M Co	California	3	40 July 9	Aug 1	Sept 1	F E Luty	330 Pine st
Equator M Co	Nevada	4	25 June 7	July 12	Aug 1	W Willis	309 Montgomery st
Gould & Curry S M Co	Nevada	40	50 July 15	Aug 19	Sept 8	H K Durbrow	309 Montgomery st
Gila S M Co	Nevada	8	25 July 22	Aug 22	Sept 6	J T McGeoghegan	318 Pine st
Hale & Norcross S M Co	Nevada	70	50 July 12	Aug 16	Sept 7	J F Lightner	309 Montgomery st
Leeds M Co	Utah	5	25 June 17	July 28	Aug 22	D B Chisholm	327 Pine st
Mexican G & S M Co	Nevada	16	1 00 June 28	Aug 2	Aug 22	C L McCoy	309 Montgomery st
Maybelle Con M Co	California	8	20 June 29	July 29	Aug 22	W J Taylor	310 Pine st
Martin White M Co	Nevada	10	25 June 18	July 30	Aug 25	H L Scoville	309 Montgomery st
Murchie M Co	California	6	15 June 10	July 11	Aug 10	S D Rogers	328 Montgomery st
Mariposa L & M Co	California	21	1 00 June 8	Aug 10	Sept 7	L Leavitt	309 Montgomery st
Northern King M Co	Arizona	6	25 July 8	Aug 13	Sept 5	E A Holmes	318 Pine st
North Bloomfield Gr M Co	California	44	1 00 June 23	July 23	Aug 17	H Pichoir	330 Sansome st
Oneida M Co	California	15	3 00 July 21	Aug 22	Sept 20	H F Bush	431 California st
Overman M Co	Nevada	50	50 July 20	Aug 24	Sept 14	G T Edwards	414 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona Mexican M Co	Arizona	1	50 June 7	July 15	Aug 8	G R Adams	320 Sansome st
Betty O'Neal M Co	Nevada	1	50 June 14	July 19	Aug 9	R W Heath	318 Pine st
Black Hawk M Co	California	12	10 July 15	Aug 19	Sept 9	H A Charles	419 California st
Con El Dorado M Co	Nevada	2	10 June 27	Aug 12	Aug 18	J M Buffington	339 California st
Eintracht Gravel M Co	California	7	5 June 14	July 21	Aug 9	H Kunz	209 Sansome st
Fresno Enterprise M Co	California	1	15 June 1	July 1	Aug 1	W H Allen	306 Pine st
Harrington M Co	California	2	5 June 15	July 20	Aug 11	I C Miller	409 California st
Holmes M Co	Nevada	2	10 June 22	July 25	Aug 15	E A Holmes	318 Pine st
Iowa M Co	Nevada	14	05 July 27	Sept 12	Oct 5	C S Leavitt	411½ California st
Iron Clad Con M Co	California	1	01½ May 25	July 10	Aug 10	A Dodt	309 Montgomery st
Lodi M Co	Nevada	3	05 July 19	Aug 22	Sept 12	A B Paul	328 Montgomery st
May Flower G M Co	California	12	10 July 19	Aug 23	Sept 13	J Morizo	328 Montgomery st
Morgan M Co	California	7	50 July 8	Aug 16	Sept 13	J Raphael	533 Kearny st
Mount Potosi M Co	Nevada	—	10 June 9	July 23	Aug 22	J H Sayre	330 Pine st
New York M Co	Nevada	26	10 July 16	Aug 18	Sept 8	D L Thomas	327 Pine st
Noonday M Co	California	3	50 June 28	Aug 3	Aug 26	Wm J Traylor	310 Pine st
North Noonday M Co	California	3	50 June 23	Aug 5	Aug 29	Wm J Traylor	310 Pine st
North Gould & Curry M Co	Nevada	1	25 July 15	Aug 15	Sept 6	N C Sonthard	331 Montgomery st
Paris M Co	California	2	25 June 22	July 27	Aug 17	W J Taylor	310 Pine st
Occidental Con G M Co	California	7	04 May 9	July 7	Aug 2	W T Smith	414 California st
Paris M Co	California	2	25 June 22	July 27	Aug 17	Wm J Traylor	310 Pine st
Rocky Point M Co	California	8	05 June 21	July 25	Aug 15	W G Hughes	330 Pine st
Red Cloud Con M Co	California	10	20 June 22	July 27	Aug 17	W J Taylor	310 Pine st
Sierra M Co	Nevada	69	1 00 July 15	Aug 18	Sept 6	E L Parker	309 Montgomery st
Steep Hollow G M Co	California	6	1 50 June 21	July 26	Aug 18	J W Pew	310 Pine st
Spaulding G & S M Co	California	2	10 June 28	Aug 23	Sept 15	J W Pew	310 Pine st
Swamp Angel G M Co	California	4	12½ June 14	July 16	Aug 4	L Little	607 Washington st
Union Con M Co	Nevada	17	1 00 July 1	Aug 4	Aug 24	J M Buffington	329 California st
Union Con M Co	Nevada	17	1 00 July 1	Aug 4	Aug 24	J M Buffington	309 California st
Union Gravel M Co	California	17	50 June 28	Aug 4	Aug 25	H Pichoir	330 Sansome st
Utah S M Co	Nevada	35	2 00 June 23	Aug 5	Aug 23	G C Pratt	309 Montgomery st
Wolverine Gravel M Co	California	2	10 May 31	July 1	Aug 1	E J Blanding	325 Front st
Wide Awake M Co	Arizona	13	10 June 4	July 18	Aug 10	G Hildebrandt	Cor Bush & Mont'y

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Aurora M Co	California	P Conklin	535 Market st	Annual	Aug 2
Columbus Con M Co	Nevada	H T Thurman	411 California st	Annual	Aug 9
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	Annual	Aug 2
Independence M Co	Nevada	E M Hall	327 Pine st	Annual	Aug 15
Julia Con M Co	Nevada	H A Charles	419 California st	Annual	Aug 10
Liberty Hill M Co	—	J W Pew	310 Pine st	Annual	Aug 1
Northern Light G & S M Co	—	F S Monroe	310 Pine st	Stockholders	Aug 1,
Navajo M Co	Nevada	J W Pew	310 Pine st	Annual	Aug 9
McMillen M Co	Arizona	J Morizo	328 Montgomery st	Annual	Aug 3
Navajo M Co	Nevada	J W Pew	310 Pine st	Annual	Aug 9
Original Emptre M Co	New Mexico	D A Jennings	401 California st	Annual	Aug 4
Original Keystone S M Co	California	F E Luty	330 Pine st	Annual	Aug 2
Occidental M Co	Nevada	A K Durbrow	319 Montgomery st	Annual	Aug 8
Rocky Point M Co	California	W G Pughs	320 Pine st	Annual	Aug 15
South Comstock Con M Co	Nevada	J M Buffington	209 California st	Annual	Aug 15
South Bulwer M Co	California	W Stuart	320 Sansome st	Annual	Aug 5

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	July 20
Father De Smet M Co	Dakota	H Dean	New York	50	June 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	July 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	July 15
Silver King M Co	Arizona	J Nash	315 California st	25	July 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	July 12
Western M Co	California	C S Curtiss	309 Mo atgomery st	75	May 12

The Mining Share Market.

The mining share market is heavy this week, as it has been for some time. In fact, the delay in any important development on the Comstock has discouraged very many operators entirely. The local papers there, however, keep hoping something will he fonnd. The *Enterprise* thinks that when the Union shaft main pnmps at the 2700 level are at work, and work is resumed on the main drift, something may be looked for.

It will he remembered that work was discontinued in this drift for the reason that an nnexpected change of formation occurred, which showed so much water that it was thought best to go hack and put in the pump hefore advancing farther into a region the water possihilities of which were unknown. It is not improhahle that something favorable will he fonnd when work in this drift is resumed.

As soon as the pumps are started it will be safe to push the east crosscuts on the 2500 level of the Sierra Nevada mine ont into the ore helt. At present, it wonld not he safe to rnn a crosscut into said helt. The diamond drill hole from the face of crosscut No. 3 showed so mnch water that it wae found necessary to withdraw the drill and plug np the hole. To hreak through into this belt or channel with a crosscut would donhtless canse a rush of water that would overflow the tank at the 2500 station of the Union shaft, and pouring down to the 2700 level, drive out the men now at work at that point on the pnmp. Once this pnmp is in and at work they will he ahle to handle all the water that will come. When the next start is made at the north end, matters there will he pretty closely watched hy mining men.

At the Yellow Jacket they are still drifting east. The vein mnst bs farther ont that direction than was at first enpposed, as it was thonght when the drift was first started that it wonld reach the edge of the vein in going about 70 ft. As it was not reached, the dip must he mnch less than ahove—it must he going off to the east quite flat.

Bullion Shipments.

We qnote shipments since our last, and shall he pleased to receive further reports:

Mt. Diahlo, July 19th, $7,041.75; Northern Belle, July 18th, $7,127.48; Standard Con., July 18th, $39,400.04; Syndicats, July 18th, $4,775.-88; Mt. Diahlo, July 22d, $6,576.34; Bodie Con., July 25th, $7.357; Northern Belle, July 20th, $6,016.76; Western, July 19th, $13,863.32; Head Center, July 23d, $4,003; Northern Belle, July 23d, $8,420.29; Buffalo (Rocky Bar, Idaho), July 22d, $3,600; from Silver City, Idaho, July 22d, $10,701; Stormont, July 18th, $3,383; Germania, July 18th, $3,249; Hanauer, July 18th, $3,950; Bullionville, July 18th, $2,419; Horn Silver, July 18th, $17,500; Ontario, July 18th, $14,304; Ontario, July 19th, $5,890; Christy, July 19th, $1,741; Hanauer, July 19th, $2,132; Mayflower, July 19th, $3,337; Custer, July 20th, $2,265; Ontario, July 20th, $8,115; Ontario, July 21st, $8,306; Germania, July 20th, $3,426; Stormont, July 20th, $3,004; Horn Silver, July 22d, $2,500; Custer, July 22d, $2,081; Charles Dickens (Idaho), July 22d, $3,500; Germania, July 22d, $1,744; Wood River, July 22d, $4,447; Ontario, for six months ending June 30th, $1,083,-263; Standard, for six monthe ending June 30th, $1,032,612; Horn Silver, July 23d, $10,000; Ontario, July 23d, $17,595; Germania, July 23d, $1,809; Pascoe, July 23d, $1,544; Custer, July 24th, $2,158; Northern Belle, July 25th, $6,716,-86; Standard Con., July 25th, $47,579.17.

MESSRS. GILMER & SALISBURY, the well-known mine operators, are in the city, arranging for the purchase of a quartz mill for the Geddes & Bertrand mine, near Eureka. A big ore body has recently heen strnck in the mine, and Mr. Gilmer saye he thinks it will develop into one of the principal hullion producers in eastern Nevada.

IN the shaft now snnk to a depth of 300 ft. at the Snlpher Bank qnicksilver mine, Nana connty, gas is a source of great annoyance to the workmen, nanseating them, and making necessary frequent changes on each shift of men required to perform the work.

A GOLD and silver mill is being erected at Croy's gulch, three miles from Hailoy, Idaho, for the Altnras company.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

EMPIRE.—Amador *Ledger*, July 23: Under the excellent management of the new Supt., Mr. Cliff, everything is moving along at a satisfactory rate. The mill is kept running on rock from the 1200 level, all hoisted from the south shaft. The ore is low grade, hut by putting large quantities through the mill it can he made to pay well. At present the full 80 stamps cauuot be kept going, as all the work has to he done through one shaft—hoisting rock, lowering timbers and men, etc. The north shaft is being thoroughly repaired. It is expected that a month more will see the shaft in perfect working order. As soon as the repairs are completed, a tunnel will he pushed north, at the 1200 level, to thoroughly prospect the 1,500 ft of unexplored ground in that direction. Indeed, this unexplored territory embraces more than one-half of the mine. There are hetween 170 and 180 hands on the payroll. An immense supply of wood is on hand, estimated at 1,500 cords, enough to run the works for a year.

CALAVERAS.

GLENCOE ITEMS.—Cor. Calaveras *Chronicle*, July 23: Thirty men are at work on the Valentine mill. The grading for the mill site is completed and men have gone to work in the tunnel. Carpenters are husy putting up the frame and building a dwelliug for the Supt. The Vance is running day and night. Times are prosperous; the Glencoe merchants are all doing a good business—receiving goods every few days and disposing of them rapidly. The Longly quartz mill is undergoing repairs, being put in readiness for crushing ore.

EL DORADO.

STONE DAM.—Georgetown *Gazette*, July 22: The Cal. W. & M. Co. has commenced the erection of a substantial stone dam at Loon lake. The wall is to he built entirely of granite, which is found in inexhaustible quantities, and of the best quality, right on the ground. We understand that that portion of the dam which it is intended to complete before winter is about 450 ft in length and 20 ft high at the trunk or highest point. A force of experienced quarrymon have heen engaged, a number of whom have already gone forward, remainder will follow before the end of the present week. All the tools and appliances necessary for the rapid and economical prosecution of the work, such as derricks, tackle, wire guys, car for transporting rock from the quarry to the dam, cement, supplies for the men, etc., are either on the ground or on their way there.

MARIPOSA.

THE NORTH HITE MINE.—This claim is the westerly extension of the Hito mine proper, and includes all the ground lying hetween the Hite mine and the celebrated Ferguson mine, the latter being situated on the north hank of the main Merced river, aud supposed to be the same lode which runs across the country from northwest to southeast. There can he no doubt but what this claim, vein and lode, will at no distant day be equal in importance to that of any other in the Hite's Cove section. It lies hetween two of the most celebrated and best paying mines, and possesses extraordinary advantages of timber, mill-site and water privilege equal to any in the State. Messrs. Hennessy & Morrison, having recalled their deed to the property which was held in escrow in San Francisco, uow advertise the property for sale.

HITE'S COVE.—The Hite gold quartz crushing company is surveying the country around, and contiguous to its mine, with a view to swallowing up everything of any importance to them in the near future. Reynold's cove, opposite Hite's cove, which gave signs of prominence some few years ago, is, so far as we are concerned, one of the hopeful things of the past. There are several claimants to the mill-sites and water privileges to be had in this cove.

NEVADA.

THINNING OUT.—North San Juan *Times*, July 22: Our population is being thiuned out rapidly. Nearly all the men who can got away are leaving. If the mines remain in *statu quo* for another month there won't he an unmarried man who works in the mines for a livlihood left in this section of the county.

ASSESSED VALUE.—The people of North San Juan are seriously contemplating the propriety of asking the Board of Equalization of this county for a reduction of 66⅔ on the assessed valuation of the town property. If the miners are reduced in that amount on their respective assessments, there is no reason to he given why town property should not also be reduced in a similar amount. If hydranlic mining should cease forever, the real estate in this town won't sell for 1 cent on the dollar of its assessed valuo. The houses, in the course of time, will become tenanted with owls, hawks, rats and swallows.

ANOTHER GOOD CLEAN-UP.—Grass Valley *Union*, July 23: Forty-one loads of rock from the Ford & Mullen claim cleaned up $80 to the load at Southern's mill, on Saturday, not including sulphurets. This was ordinary rock from the claim, which did not run to specimens.

PAY DAY OF THE BONANZA CLAIM.—Yesterday, at Boston ravine, was pay day of the Ford & Mullen claim, when a settlement took place hetween the owners and John Ford & Co., the lessees, from the recent clean-up of rich quartz. The company of lessees number 11 men, and they each received as compensation $18 per diem for 6 weeks' work. The 3 interests in the ownership of the claim received about $3,000 each. It was a nice "divy" all aronnd, and every one connected with the mine was well satisfied.

MARYLAND MINE.—The new shaft being sunk on the Maryland quartz mine (adjoining the Idaho on the east) has heen sunk and timbered a distance of 20 ft. It is a two-compartment shaft, 9x4½ ft. The shaft under the present contract is to he sunk to the drain tunnel level, a depth of about 320 ft. The shaft follows the dip of the vein, which is 68 degrees. The walls of the veiu have the same geological characteristics as the Idaho.

SUIT.—Nevada *Transcript*, July 23: The proprietors of the Ford, McDonald & Mullen mine have hegun suit for trespass against the Rocky Bar M. Co., claiming $40,000 damages. The two properties are adjoining. It is understood that the Rocky Bar admits having worked over the line, but denies that the ore extracted was of a rich quality. The rich ore chute in the Ford & Mullen ground is close to the houndry line hetween the claims, and that company contends that the rich ore taken out by the Rocky Bar Co. about one year ago was from their ground.

PLACER.

THE LINCOLN COAL MINES.—Placer *Herald*, July 23: As we mentioned briefly a few weeks ago, the Cook ranch, near Lincoln, embracing about 240 acres, has heen sold to John Landis, of Wheatland. On this ranch is located what is known as the Clipper coal mine. On obtaining possession Mr. Landis immediately took measures looking to the operation of the mine. He has already a steam engine in place, and is at present erecting hoisting works which it is expected to have completed sometime this coming week. A good many orders for coal have already heen received, and the prospects for an extensive husiness in the way of taking out coal are encouraging. The mine has heen closed for several years through a perplexing litigation.

PLUMAS.

GREEN MOUNTAIN.—Greenville *Bulletin*, July 20: A new hattery frame has heen put in the old mill, and both mills are now running full time on good quality of ore.

SOUTHERN EUREKA.—The mili is running steadily, and work in the tunnels is progressing. President Scott is expected from New York early in August, soon after which time it is likely that the milling facilities will he inereased by the addition of more stamps.

CHEROKEE.—The Garfield shaft is gow down over 180 ft, and drifts from it supply abundant ore for the continuous running of the mill. A still better quality is expected to be encountered at a greater depth.

THE BUTTE BAR LEDGE.—Plumas *National*, July 23: For some time past work has been prosecuted on the quartz ledge at Butte Bar, which created such an excitement 20 years ago. At that time the ledge was discovered at a point where the river canyon had cut it down, leaving the face of the ledge exposed, and fairly bristling with gold. The parties who found it became somewhat excited and put in a heavy load of powder to "shake it up," and they succeeded so well that the rich rock was blown into the middle of the Middle Fork. Considerable work was done at that time, and then the mine was abandoned. Last year some Virginia men were directed to it, probably by one of the original owners, and they have been prospecting it considerably, and have developed a splendid body of ore carrying sulphurets in large quantities, which are very rich. The mine is very extensive, but it is located in an out-of-the-way place, almost inaccessible at the present time. Those who have visited it claim that it will make a stir in quartz circles before long.

ELIZABETHTOWN.—The Loring & Leavitt claims, recently purchased by Corbin & Manson, are holding out fully up to all expectations, and proving that the new owners made a good investment. Although the company are working a large number of men, only a few of them are taking out gravel—the balance being engaged in putting up new hoisting works, getting timbers, etc. A shaft has been sunk near the Loring dwelling house, in the lower end of Betsy gulch, and the bedrock, at the depth of 18 ft, was found to be pitching sharply into the hill. From the bottom of the small shaft the sum of $6, in smooth washed gold, was panned out, and another shaft has been started farther back into the hill. A drift is being made to connect this ground with the main tunnel, and there is no doubt but that some big pay will come out of it. It is beginning to be pretty well demonstrated that the whole flat is a deposit of coarse gold and a splendid mine. We are glad to record the success of this claim, and hope the new owners will double their money a dozen times over.

SHASTA.

FLAT CREEK.—Shasta *Courier*, July 23: The Flat Creek mining camp has been, since its discovery, a flourishing one in placer mining, and, of late, splendid quartz developments are being made. At present Ellis & Brumfield, who have a fine ledge, have run in a tunnel and tapped their ledge at a depth of 100 ft from the surface, and find that they have a 3-ft ledge of good pay ore. E. O. Parker, who owns the two first discovery claims on the west end of the same ledge, has a shaft down about 60 ft, and some of the quartz, worked by arastra process, has paid at the rate of $17 per ton. As the vein at the bottom of this shaft is 4 ft wide and plenty of quartz in sight, this is considered a fine result. Next to Parker's comes the Murray Bros.' claim, on which they have sunk a shaft 140 ft deep, following the ledge all the way, and at that depth find their quartz 2½ ft in width and wall rock 6 ft from wall to wall and solid. Quartz from this ledge pays well from the croppings to the bottom of the shaft. Adjoining the Murray Bros.' claims follows the Ten Eyck boys, who are getting out timbers and commencing a tunnel to tap their ledge 200 ft below the croppings, the ledge having been prospected by shaft to a depth of some 40 ft. Doc. is at work on this claim himself and says that the ventilation and air on the mine discounts that of Redding, as a day's work don't require a tenth part of the puff and blow which his bellows performed when residing at the terminus. Altogether, the mining outlook for Flat Creek is most promising, and we confidently expect to see the camp support a large and thrifty population within a very short time, there now being some 30 men at work in that vicinity.

SIERRA.

NO IDLE MEN.—*Mountain Messenger*, July 23: Not an idle man, able-bodied and who desires work, can be found in Sierra county, and there is room for more to do service in the development of our rich quartz and gravel.

BORING MACHINE.—J. H. Thomas has a boring machine, 8 inches in diameter, on route from San Francisco, with which he will prospect the rich gravel ridge between La Porte and Gibsonville.

A LARGE number of miners from San Juan arrived in Forest city this week, and are now working for the Bald Mountain Co.

STARTED.—Steven Spencer, one of the owners of the Alaska quartz mine, near Pike city, was in town Wednesday, and reported that the new 20-stamp mill has just been started.

SOLD.—The Rising Sun gravel mine and the Hidden Treasure quartz mine, situated just below Loganville, have been sold to parties below. The price paid was $26,000.

MORE MEN.—The Bald Mountain Co. have recently put on a considerably larger force of men than they have been working lately. The work is done by the day, the price paid being $3.

THE Virginia Co.'s ground, Howland Flat, has been leased to Louis Cross for two years, at $3,000 per annum. Mr. Cross has a large force at work.

QUARTZ MILL.—A gentleman by the name of Hewston has purchased the Good Hope quartz mine and the Kanaka mill, belonging to the estate of Jo. Berg. The mill has been taken down and will be moved to this place and erected on the North Fork, near the bridge leading to Ben Pauley's sawmill. The site has been selected and the survey necessary to bringing in the water has been made. The site of the mill is immediately below the mine, and the rock will be lowered directly into it upon a tramway at a trifling cost. We believe it is the intention to have the mill running inside of 30 days.

REIS' RAVINE.—This other day we enjoyed a pleasant visit with Mr. and Mrs. Alexander, at Reis' ravine, on the road, via Saddle Back, to Howland Flat. Here at the dizzy elevation of 5,800 ft above Old Ocean, where snow fell 2 years ago to the depth of 25 ft (last year it was not more than 10), he raises onions, lettuce, peas, beans, tomatoes and many other kinds of vegetables. Irrigating water not over-abundant; that for mining purposes generally lasts from 50 to 60 days. The morning we were there Mr. Alexander found a $9 gold nugget. He showed us a larger specimen, 4 ozs., taken out of his diggings 4 years ago. All work is done on the top of lava, covering flunker hill and Sebastopol, and the labor thereon paid well this season. Fifty days was all the time put in sluicing gravel. It is figured by those who ought to know, that a tunnel, 1,200 ft in length, with about 150 ft of hard rock, would develop a large and rich field of gravel. Two hundred thousand dollars worth of gold has been taken out, on the lava, at Reis' ravine.

HOWLAND FLAT.—The hydraulic mines here and at Pine Grove have done as well as usual this year, which means a large profit above expenses that were 33⅓ of the gross yield. The Bonanza gravel lead is well defined, and the work of development being pressed with vigor under the able management of Supt. L. M. Stangroom. This mining property promises to become one of the best paying drift claims in Sierra. The Empire channel, on the same lead below, in 4 years yielded $140,000 in dividends to its lucky stockholders out of only 400 ft of channel. Main tunnel 4,800 ft in length. Eighty men are steadily employed, night and day. The extensive dump house, reservoirs and lengthy tail flumes are in excellent order. Water is obtained in ample supply from the Scare' Union ditch the year round. The California gravel claim, south of Table rock, is very, profitable, with a fair prospect of becoming of great value.

NEWARK.—Pilot Peak company are repairing their flume and reservoir. Their claim is bonded, but for only one-quarter of its value, the present owners being determined from developing their valuable property for want of means. The Enterprise gravel diggings paid well this season. The Old Washington le being prospected. The Swiftcure tunnel has been put in order, in old ground worked years ago, the back of which is being searched for pay. The North American company are realizing their usual handsome dividends, and employ a large force.

GIBSONVILLE.—Gibsonville water and Gravel Hill mining company. F. A. Gourley, Geo. W. Cox and J. P. DeNoon, have finished their clean-up. Result has come up to their most sanguine expectations. Gross proceeds, $36,000, one-third of which is dividends. The Nevada ground, about 30 acres, was lately purchased by these gentlemen. Fifty men have been employed all the season.

RICH HAUL.—Nineteen thousand dollars was recently realized from 100 square ft of bedrock in the Sears' Union hydraulic gravel diggings, Pine Grove.

THE MILL.—The material for the quartz mill for the Good Hope is coming down from Kanaka Flat. The mill is to be 20 stamps. The ore is to be taken down upon a tramway, the loaded car taking the empty one up.

CONTRACT LET.—The Eclipse company have let a contract to Mr. Farrel to run a tunnel in their mine, above Geodyears, at $15 per ft.

PHŒNIX.—We are indebted to Sheriff Fish for a fine specimen of gold-bearing quartz from the Phœnix mine, above Sierra City. The rock is extraordinarily rich in free gold.

THE Wilburn Con. shaft is down 150 ft. No bedrock has yet been reached.

THERE is some talk of resuming work in the fown gravel claim at Mt. Pleasant ranch. Parties who claim to be posted assert that those diggings will ultimately be proved among the richest in the county.

STEADILY PROGRESSING.—N. H. Ball, Esq., Superintendent of the Savage gravel mining company, called on us this week, reporting that their main tunnel is being vigorously pushed ahead between 25 and 30 ft per week through hard granite rock. The new air compressor works smoothly; also the Ingersoll drill.

MORRISTOWN.—The lats clean-ups at this noted mining camp have been very remunerative. Most of the ground was worked at Craig's flat.

TUOLUMNE.

NEW MINING ENTERPRISE.—Tuolumne *Independent*, July 23: A party of San Francisco men have styled themselves the Columbia M. Co., and have purchased the Stayton mine, near Five Mile creek. About 20 men are at work grading mill-site, preparing for double shaft, getting out lumber for mill house, hoisting works, boarding house, etc. The mill will be composed of 2 of Huntington's patents and Dodge crusher—capable of crushing from 12 to 15 tons in 24 hours through 40-screen. Engine and machinery on the way up from Oakdale. S. O. Brown is the superintendent. There are a number of good mining prospects in the immediate vicinity that are bound to be developed in the near future by some one.

MINE SOLD.—Since Messrs. Divoll & Co. have been so fortunate in their mining enterprise there are others who have a fearly hankering for some of the same sort. Mr. Mark Hughes, who purchased the old United States lot shortly after the strike, which is immediately adjoining the gold crop, and on the same vein, probably held the idea that the town patent gave him a clear title to the mineral contained therein, and that no one could invade his premises. However, he, not being so sure about this proposition, located several hundred ft of ground, including this lot—taking in the Episcopal church and all other city property to the Colby claim, which is located on the opposite hill, a distance of 1,000 ft, more or less, with 300 ft on each side of said lode. Mr. Hughes, not feeling able to open this property as it should be, leased the claim to a company of Stockton men, who have gone to work in earnest to see what there is in it. A few days ago the Stocktonians, at a depth of 100 ft, broke into the Bonanza works, when an injunction was served upon them. It seems that both companies are now claiming the same ground.

NEVADA.

WASHOE DISTRICT.

CON. VIRGINIA.—*Enterprise*, July 26: On the 2500 level are cutting out a station for the joint California winze; also, are running a south drift on this level for a sump; progress, 14 ft.

CALIFORNIA.—During the week 72 tons of ore have been extracted and sent to the mills; assay value, $35.

UNION SHAFT.—Cutting out a station at the 2700 level, and putting in foundation and pumps; also, easing timbers at the 2300 and 2400 levels.

ALTA.—During this past week we have sunk and timbered the shaft 13½ ft; total depth, 2,137½ ft. The bottom of the shaft is passing into porphyry, which will prove more favorable for sinking.

NEW WELLS-FARGO.—The northwest drift on the 500 level has been advanced 16 ft during the past week. On last Monday morning, July 18th, this drift cut through a well-defined clay wall, leaving the hard rock which the drift was started in and passing into soft vein matter—quartz, clay and porphyry—giving low assays. The face of the drift is still in the same formation.

YELLOW JACKET.—On the 2828 level they are employed in drilling east from the north winze. The hole is in 230 ft. The drillings give low assays. Are also cleaning out and timbering the south drift toward the Crown Point workings on this level.

HALE & NORCROSS.—The winze from the 2400 level has been sunk 13 ft; total depth, 86 ft. Water continues strong. Our main pumps are running steadily. The temperature of the mine has increased considerably since last report.

OVERMAN.—The drift on the 2275 level has been extended 53 ft. The ground slacks off so much that we have had to put in 9 sets of timbers.

CALEDONIA.—Pumps have been running on an average of 7 hours per day, consuming 3 4-7 cords of wood per day.

ANDES.—The west crosscut has been advanced 10 ft during the past week, and is now much better working than heretofore. The face of the drift is in quartz.

CHOLLAR-NORCROSS-SAVAGE SHAFT.—Have eased the shaft timbers on the north side at the 2400 level during the past week, and put in new suction pipes on the old pump.

SUTRO TUNNEL.—As the air in the main tunnel is quite hot, we are running a line of pipe from the blower to supply the timbermen with better air, and 700 ft of the same has been placed in position. On the 21st 3 carpenters commenced putting in a door and partition near the connection of shaft No. 2, for the purpose of making the shaft a downcast and improving the ventilation of the tunnel.

BRISTOL DISTRICT.

FUANACE.—Piocho *Record*, July 18: The Day furnace at Bristol fired up Monday last at 3 o'clock P. M.; at 6:20 they were dumping slag, and at 8:10 P. M. the first lead bar was cast. The furnace was started on low grade ores, waste, etc., and it is expected that on the 10th inst. the standard of the bullion will be attained, when bars will be cast for shipment. The Day and Mendha mines are improving as every stroke of the pick is made. The company has now about 800 tons of ore, 28,000 bushels of charcoal and 300 cords of wood on hand at the furnace, and intend to have that much in reserve all the time. The bullion will be shipped via Milford to San Francisco. Managing Director Orim is on hand day and night. He and Supt. Gould are working like Trojans to make the Day Co.'s enterprise a big success.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, July 18: There are being extracted and sent to the mille about 85 tons of ore daily. Both mills are running steadily, and doing their usual good work. Bullion shipments for the week ending July 13th amount to $21,595.98; shipments on July account to the 13th inst. aggregate $33,625.07.

MOUNT DIABLO.—In the north crosscut from the bottom of the winze, from the third level, a streak of ore has been cut through which assays from $70 to $100 per ton, the face looking more promising. On the 8th inst. $9,038.73 in bullion was shipped, and on the 12th an additional $8,133.58.

HOLMES.—The company has resumed operations, and is working a small force of men at present. It is understood increased energy will be put forward in a short time and the mine thoroughly developed.

ESMERALDA DISTRICT.

PROGRESS.—Esmeralda *Herald*, July 23: The mines on Silver hill are looking much better than ever before in the history of the camp. The Cortez is running on the ledge in 3 places, and the rock exposed in all is literally bespangled with coarse gold, in fact, much of it may be said to be gold, stuck together with a little quartz. The Centennial is improving very much in the bottom of the incline, and the ledge has widened out to fully 5½ ft between the walls, which are as perfect and regular as the walls of any building in the town. The Humboldt West still improves with work, and is undoubtedly a large and fine property. All that is necessary to make this one of the leading mining camps of Nevada is a good mill, so that we can send out some bullion.

THE CENTENNIAL.—Ore is getting much better and the ledge is widening.

CORTEZ.—The incline has been driven down 10 ft this week, and is 202 ft. The ledge in the bottom holds its width, and this ore will go many hundreds of dollars per ton. The east drift has been driven 9 ft in the same character of ore, making its entire length 58 ft, while the west drift has run 9 ft in ore, much of which will yield its thousands of dollars per ton, and none of it falling below $200. This drift is now in 73 ft in this character of ore. If this mine was located in some place where wood costs $30 a cord and water run in pipes 25 miles, it would have a 20-stamp mill running in less than 2 months.

THE HUMBOLDT WEST.—In the south drift on the 100 level fair progress has been made during the week. The same rich ore has been encountered as in the crossout on the same level. The ledge in the crosscut is 22 ft thick, and the ore will average $30 to $40 per ton.

MONTEZUMA DISTRICT.

ESMERALDA'S SMELTING CAMP.—Cor. *True Fissure*, July 16: Over two weeks ago the furnace of the Shawmut Co. was started up, and since that time has been running steadily. Its production has been an average of over 4 tons of lead silver bullion every 24 hours. In starting it required about 48 hours of experimenting with the ores to determine the mixture of fluxes and ores needed to give the best results. Since then the furnace has been running very successfully, and there is now molded and ready for shipment over 50 tons of lead silver bullion. This, I believe, is the first silver lead smelting furnace that has been started in the eastern part of Esmeralda county, but with a railroad through this section of the country many similar enterprises will be started. The present high rates of freight, however, operate against the mines high in lead and low in silver, as at present rates of freight lead does not more than pay its way to market. The furnace used by the Shawmut Co. is what is known as the water-jacket, which undoubtedly is superior to any other in use. This furnace was constructed by Messrs. Rankin, Brayton & Co., of the Pacific iron works, San Francisco, and like all the work of that firm is complete in detail and adapted to the requirements of practical work. This style of furnace has the capacity of more than any other for continuous work—the great desideratum for the effective and economical reduction of ores. This is regarded as a very important enterprise for this section of the country, and its success will call the attention of capitalists to the vast deposits of copper and galena ores which abound in this part of Nevada, as soon as made accessible by the rapid approach of the railroad. There are about 50 men employed at present by the company, besides the choppers and coal burners.

PIOCHE DISTRICT.

CLEANING UP THE MILLS.—Piocho *Record*, July 18: Jas. McFadden has taken the contract to clean up the 20 and 30-stamp mills of the Raymond & Ely Co. He will clean up the mills by Billy Keeler's new process, and Keeler is a partner in the job. Both parties went down to Bullionville on Monday and started in on the job.

BLACK ORE.—J. V. Keeley, according to orders, shipped a ton of Raymond & Ely black ore to W. S. Oodbs, at Frisco, Utah, last Saturday, where a dry test will be made of the ore.

WASHINGTON DISTRICT.

MILL RUNNING.—Esmeralda *Herald*, July 23: A gentleman in from Washington district, East Walker river, informs us that W. R. Rison has his mill running, but, everything being new, will have to run slowly for a day or two to get everything in running order. Mr. Rison's idea is, and has always been since he first saw the ore in this district, that the best method of getting the ore into cash was by concentrating the ores and shipping the concentrations to San Francisco, where they can be readily sold for from 80% to 90% of the assay value. He has several mines there and has tested the ores by shipping it to San Francisco, where it has been worked by every process known, and he is satisfied that by his present mode there can be the best results obtained. Mr. Rison has about 20 men employed, and will employ more as soon as he gets under full headway.

ENCOURAGING.—*True Fissure*, July 16: The news from this district continues of an encouraging nature. In all of the different locations now being worked ore assaying up in the hundreds seems to be the rule. Ell Johl has several locations, from the surface of which very fine ore is being taken. Joe McClane also has 3 locations, each of which at a depth of a few feet show assays that are marvelous. This district is easy of access, being situated on the south side of the Carson and Colorado railroad, and 10 miles east of Walker lake. It is 10 miles west from New Boston. The district was formed on the 27th of June by J. A. Thomasson, George Olsen, E. F. Griffin, P. L. Carroll, Richard Kelly, Ell Johl, J. C. McDonald, C. C. Radcliffe, James Davis, Stephen Walsh and John Hawthorne. During the present month the different prospectors now at work will have so far developed their claims that something of their permanent value will be known.

ARIZONA.

MACK MORRIS.—*Silver Belt*, July 10: Two new ore wagons passed through Globe, from Wilcox, for the Mack Morris Co., and laden with the last installment of machinery for the hoisting works for the Mack Morris mine.

SOUTH PIONEER.—The South Pioneer's condition may be approximated by a perusal of the following figures: 235 ft of exposed ore body on the 70 level, the average thickness say 2 ft; hight of drift, say 7 ft, making 329 tons. No stoping has been done except in the north end of the mine, and only a few tons have been taken out there. The South Pioneer M. Co. have purchased 150,000 ft of Oregon timber in San Francisco, and will soon have it at their mine.

ITEMS.—Geo. Scott has bonded the Pioneer mine for $75,000 to Eastern parties, who have paid a forfeit of 10%. The Stonewall Jackson is producing a splendid quality of ore. The full force of men will shortly be at work. The East Richmond is an extension of the Mack Morris. Its dumps, that of the La Plata and the Mack Morris are on the same line—the latter connecting the two. It is a strong, well-pronounced vein, with ore differing in character from what is found in the Mack Morris. Its greatest known width is 13 ft, which is on the 25 level in shaft No. 1.

COLORADO.

GRAY EAGLE.—Silver Cliff *Prospect*, July 15: Work is still progressing on the 250 level of the Gray Eagle mine. The crosscut has now reached a distance of 52 ft, and it is soon expected to cut the vein.

RACINE.—The Racine Boy mine still continues to show rich pockets of horn silver. Some very rich and handsome specimens have recently been extracted from that mine, which is one of the most remarkable in the West.

THE CROWN PRINCE, adjoining the Ouray, is about 80 ft deep, and the obsidian dyke is now changing to porphyry that is showing some manganese.

THREE carloads of the machinery have arrived at the depot for the Duryee furnace, and is now being hauled to the works. The other carloads are expected to arrive soon, and the work from now on will be pushed with vigor.

LAST March the Lacrosse and Green Horn consolidated, and then sold their properties to the Comargo company. The Lacrosse now owns other valuable mining properties on which they soon expect to commence work.

OURAY.—The recent developments in the Ouray are making a good showing. The rock yesterday contained a considerable quantity of chlorides. This property is owned by the Silver Prize Co., and Supt. Foss feels greatly encouraged over the results.

KING OF THE CARBONATES.—Yesterday the reporter visited the King of the Carbonates, located about a mile north of the city. Last year the main shaft was sunk to a depth of about 80 ft, and the vein carried some carbonates of lead that assayed high. A few weeks since a new vein was opened up near the old shaft, which contains copper and bromides of silver, and some chlorides were found yesterday.

FIRST IOWA.—A few days since work was suspended on the First Iowa, but Mr. Nevins, the Supt., yesterday informed the reporter that in a short time its development would be resumed. The main shaft has already been sunk to a depth of 200 ft, and the vein has slowly but surely been developing more richly.

CRYSTAL.—The Crystal, owned by the Galena M. Co., is about 100 ft deep. But little work was done on this claim last year, but the company is rapidly hurrying its development this summer and with favorable results.

IDAHO.

MIDDLE FORK.—Yankee Fork *Herald*, July 23: Messrs. John W. Stoddard, Richard Euler, Emanuel Fontesq, Isaac Daley and Patrick Dowling spent several days in town this week getting supplies to take to their camp on Middle fork. Those who came in brought several specimens of antimonial silver ore, which assayed as high as $5,000 and $6,000 per ton. They have located three mines on a belt which they have traced a mile and a half. The ledges are within 300 ft of each other, and from 1 to 8 ft in width. The ledge from which the rich specimens were taken is 8 ft wide, and the richest seam 18 inches. They have undoubtedly made discoveries that will not only attract a great deal of attention, but will create a stampede for that rich mineral country this year. The district is located about northwest of Cape Horn, where timber and water is abundant. To prospectors, we will say that the best route to the new El dorado is via Bonanza and Loon creek. The new finds there and near Prairie Basin show that the Bay Horse, Kinnikinic, Sawtooth and Yankee Fork belts extend over a vast amount of country, and that all that is needed to insure a population running way up into the thousands is the judicious investment of capital.

MONTANA.

LEASED AND BONGRO.—*Inter-Mountain*, July 16: The Olive Branch, a very promising prospect located near the Colorado smelter, and owned by Perry Blaine *et al.*, has been bonded within the past few days to J. P. Lawson, Prof. Clayton and S. A. Vaughn for the sum of $22,500, the bond to extend until the 1st of December. It is the intention of the bondees to begin at once the energetic development of the property. Another property which will likely come into early prominence is the Sheridan, located on the Black Chief ledge, 300 ft south of the Mountain Boy, and owned by Jake Reeding, *et al.* It has been bonded to Joseph Lecaff, Robert Fenner, John Hauswirth and Mr. Gagliolaino for $15,000. Eight men are now employed.

ALDER ORE.—Butte *Miner*, July 10: Messrs. Layton & Rice, owners of the Prospect lode, have just had a batch of quartz sampled at the Colorado smelter, which was taken from their mine. The mine is located about 1 mile west of Virginia City, Madison county, and shows a large vein of ore, with several hundred tons piled up on the dumps at different places. Messrs. Layton & Rice had about 10 tons hauled to the Colorado smelter—7 tons of first-class and 3 tons of ordinary ore. The first-class ore sampled $382.05 per ton—$276.45 in gold and $105.00 in silver. The 3 tons of second-class ore sampled about $100 to the ton. The bringing of the ore to the smelter was to test it, and a sufficient number of tons were brought to do it thoroughly. The sample value of the 10 tons was over $3,000, or $300 per ton. The experiment proved highly satisfactory. This ore will pay to haul quite a distance.

NEW MEXICO.

RINCON.—New Mexican *Mining News*: Rincon is fast developing into a promising mining district. It has been known for some time that a number of old mines in the district had been worked to a considerable depth by the Spaniards years ago, but nothing was done until recently to re-open these shafts. The whole district, however, is now alive with prospectors, and many new claims are being worked and some very high grade ore taken out. Just north of Rincon are the Coyote springs where the Bonaparte and Cave canyon mines are being very successfully worked. The ore taken from them resembles very much the celebrated black ores of Lake valley, and like those are also very rich in silver. Some fine gold is also seen in it without the aid of a glass. Rincon mining camp is now only 6 months old, but judging from the amount of work being done at present, and there is every reason to believe that it will be kept up, before 6 months roll around the district will be able to show some of the best developed and most valuable mines in New Mexico.

WHEN Bonanza city begins turning out bullion, which she will do next week, she will be on the high road to prosperity. Through the two years since the camp has been in existence the miners have been held back by being unable to realize anything from the ores taken out, and as soon as they can get money in return for the labor expended they will go ahead with a rush. In contemplation of the early operation of one of the smelters now being put up there, and the subsequent starting of the other, a number of contracts have already been let, and it is expected that during the next two months work will be livelier at the camp, and indeed all over the district than it has ever been.

OREGON.

BRIEFS.—*Democratic Times*, July 22: S. Arrasmith is working a bar near Wm. Augle's place, on Applegate. S. Carter has not sold his claim on Squaw creek, but only leased it. The miners of Gall's creek still have some water and have generally done well. A clean-up is being made at the Applegate M. Co.'s claims, now worked by Silva & Beck. Most of the miners of Sterling were in town Saturday, and report some cleaning-up still going on there.

UTAH.

PARK NOTES.—*Record*, July 16: In the Hawkeye the men are engaged in cutting a station on the 300 level. The lower tunnel of the Wasatch is now in about 800 ft. The workmen have encountered a body of hard quartz and they expect it will take them about 9 weeks to get through it. The Hidden Treasure is the name of a new discovery about one and a half miles southeast of the Jones Bonanza, which shows up as well as any prospect in the camp. A vein of 4 ft or are averaging about $20 clear across has been discovered on the surface. The Jones Bonanza comes to the front this week with the information that on Friday last the vein was cut on the 300 level, and measures 8 ft in width, the ore being of a much better quality than at any other point in the mine. The vein in the Bonanza has been cut down to the 400 level.

NAW ANTIMONY DISTRICT.—Salt Lake *Tribune*, July 21: This district is now looking well, and the present working of the mines show a marked improvement in the depth and width of this valuable deposit of antimony. This district has now about 50 miners employed, and can be reached via Milford, the end of the track of the Utah Central, in Beaver valley, thence by the way of Fremont pass to the Sevier river, and up the East fork of the same to Grass valley to the mines. The distance from Milford is about 60 miles, over a well-watered and timbered country. The scene through Fremont pass and up the Sevier river will cheer the heart of an old prospector. The wagon roads are in good condition, with speckled trout in every stream, and the sage chicken under most every bush. This district is situated in Pluto county, the first Gentile county in Utah.

Gillespie District, New Mexico.

A correspondent of the *Arizona Journal*, writing from Grant county, N. M., eays: Dietrict Gillespie is an infant of the tender age of six monthe in the family of mining camps, hut of euch health and vigor ae promises to deprive other members of that great family of mucb wealth and reputation. This camp was discovered in Decemher laet, and takes its name from one of the pioneers, Ed. Gillespie, who for 18 years has heen engeged in mining in California and Arizona. The main lead runs in a northwesterly and southeasterly direction, and is well defined in porphyry and limeetone. More distinctly defined, I am informed, than the famons Comstock lode. The ore containe native silver, horn silver, chloride and hlack sulphide. I am informed that there is practically no copper in the ore and that it is free milling. There are ahout 50 men in the camp, all doing well. In fact, I have never visited a mining camp whcro I saw a greater proportion of miners working their claims. All appear to have money and pay cash for their purchases at the store. The sale recentl- negotiated hy Gen. Rolline is destined to do much good. The purchasere, Gen. Gentar and Mr. Gentry, with their associates, propose to find out what is in their purchase without nnnecessary delay. They examined the surrounding conntry and eaw sufficient wood and water to justify the

Erection of a Stamp Mill.

Before leaving, they contracted for einking 100 additional feet in the shaft of the Snnrise Sonth. These capitelists purchased two mines, the Sunrise South of Michael Lane, Tom Manners, and two others, for $44,000; $4,000 down, the balance in 90 days; and the First Prize for $20,000; $1,000 down and the halance in 90 days. The First Prize is a ehort claim of 600 ft., lying between tho Snnrise and Sunrise South. It was the desire of Gen. Gentar and associatee to pnrchase the Sunrise of Ed. Gilleepie, hut they could not agree upon the price. There are

Other Promising Claims

In camp that are worthy of more extended notice than I can give in this letter. The Old Judge, owned hy Michael Horn and others, is parallel with and adjoining Gillespie's Sunrise. Not mnch work has heen done on this claim, hut good oro has heen taken from a shaft 10 ft. deen. Joe Ladue has sunk a 50 ft. shaft on the Homestake and developed a good showing. Charley Petere has made a good showing on his claims. Since leaving Gillespie I have met Mr. A. V. Comstock, who was foremau in the Bonanza mines of Nevada. Mr. Comstock visited Gillespie with Dr. Whittle, of San Francisco, extending hie visit through the week. He makes a good report on the camp.

Route to Gillespie.

Some of yonr readers may desire to know how to get to Gillespie. The most expeditious and comfortable way is *via* Lordsburg etation and Shakeepeare. After leaving Leitendorf'e wells there is a drive of 35 miles to Aleman springs before water is reached. The distance from Shakespeare to Gillespie ie ahont 60 miles over a plain road that cannot he missed if one does not persist in going wrong.

No Capital Wanted.—The Wood River *Times* says: Many persons in this section are looking for capitalists to take their property off their hands; they beg for capital, cry for capital, while if they turned to and went to work with a will they wonld donotless soon dig all the capital that they need out of their own ground The fact is, that to open our mines we don't need capital; our ores are enormonsly rich, and our mines pay from the very grass roots. All that is needed is a little muscle judiciously applied. If we ouly work vigorously we will open np mines enough this year to not only make ns independently rich, hnt to enahle ueto supply money to those very persone to whom we, in our present circumstances, would apply for linancial assistance. The lack of smelting works is hadly felt just now, to be eure; hut even these will come soon if we eiow up very much of the wherewithal to keep them going.

Meadow Lake.—Last Thnrsday a heavy sale of Meadow Lake mining property was made hy Messrs. H. K. Silvey, Charles A. Giffen and J. B. Giffen, of Truckee, to the Massachnsetts Con. M. Co., of San Francisco. Messre. Silvey *et als.* located the claims many monthe ago and have done more or less work on them ever since. Thero are eeveral locations inclnded in this sale. The Massechnsetts M. Co. is comprised of some of the heaviest capitalists at San Francisco. It is the intention of the company to commence operations on the property at once. It has often heen said that it was impossihle to make Meadow Lake ores pay, hut this company feel satisfied that it is a great mistake, and they propose to prudently demonetrate it to the eatisfaction of all adveree critice. When this company starte in with ite operatione we can confidently expect to hear of a hoom in Meadow Lake minee.—*Truckee Republican.*

The furnace at the iron mines near Clipper gap is turning out ahout 30 tone of pig iron per day. It is reported that the iron company has ordered from the East all the neceesary machinery for a rolling mill, which will he erected near the furnace. It ie the intention to manufacture railroad iron, gae pipe and euch other iron waree as will command a profit on thie coaet.

The Beet & Belcher M. Co., has received the United States mining patent for its claim.

Location and Lode Discovery.

In a recent case hefore the Commissioner of the General Land Office, an attempt was made to oust a locator, on the ground of illegality, hecause no vein or lode had heen discovered prior to location, and none had heen discovered eince. The Commissioner declined to order an inveetigation, because of the want of proper evidence, there heing nothing hut allegations to sustain the charge. In attempts of this kind to secure an investigation, the charge mnst be eustained hy the strongest kind of evidence.

In this connection, it is proper to say, that if the Commissioner of the General Land Office had a telephonic connection with every locator of a mine in the country, and was asked the qnestion, "What to do?" he would advise each snd all under any and all circumstances, to ohtain a patent the first thing, and hefore development. Why? Becanse it is likely to avoid vexatious and expensive litigation. It rarely occurs that an adverse claim is put in hefore a mine is ehown to he valuahle; then the claimants ewarm like mosquitoes, and, like that hird, are after hlood, and will pnt every ohstacle in the way of a legitimate locator to prevent him from ohtaining his owu. It is no exaggeration to say, that fully three-fourths of the adverse claimants to the mines have really no claim at all, but set up proceedings for the sole purpose of heing hought off, and in this they are too frequently successful, for their fraudulent claims cannot always he discovered in the land office, for it ie a simple matter to get up any required evidence by a comhination of interests. And this is really comhination work, for one who has great facilities for knowing what comee into the General Land Office, says that there are uudoubtedly organized hodies of men, whose sole husiness it is to get up adverse claims throughont the minoral regions. They have no other husiness, and eome of them have been very successful at it, *i. e.*, made fortnnes. It is one of the evils inseparahle from mining, and cannot be prevented eo loug as locators do not promptly ohtain a patent for their claims. Better far lose a little eomething on a felse lead occasionally, hy paying the expense of patenting, than when a good strike is made, be hampered hy a hand of unprincipled harpies ae hase as their unprincipled counsel.—*Cor. Inter-Mountain.*

Mines Under Bond.—There are no less then 12 promising Eureka mining properties under bond to Eastern and European parties. A number of these sales will he consummated within the next two or three months. Several San Francisco capitalists are anxious to secure properties in Eureka, and agents will shortly visit our district to eee what can be had. Altogether we ought to have something of a mining hoom here hefore snow flies. The steady dividends of the Eureka Con. and Richmond are attracting wide attention to our district and creating an impression that cannot fail of beneficial results in the end. No mining camp in America can to-day boast of two such productive mines as the Eureka Con. and the Richmond. If the Albion shall he added as a third dividend payer, which is not at all improhahle, the general prosperity will he greatly enhanced. The Geddes & Bertrand also promises to take a leading rank as a hullion producer during the fall months. Eureka's ontlook is as hright at this writing as at any time in its history. It ie true that husiness of all kinds is measnrahly overdone, hut this is in no sense the fanlt of the camp, or does it prove any leck of resources.—*Eureka Sentinel.*

Remarkaele Recovery.—We will not vouch for the followng etory going the rounds of the press; hnt as it is a matter of interost we give it: The whole scientific world and every visitor to the Smithsonian Institnte at Waehington is acquainted with the extraordinary recovery made some yeers ago hy a man in Vermont, who had a har of iron shot throngh his brain and yet lived many yeare. A somewhat similar case has jnst occurred in Montana. The telegrams, four weeks ago, reported that Patrick Mulligan, a miner, was pierced through the hody by a drill an inch in diameter, two ft. long, and weighing eight pounds, which fell eeveral hundred feet upon him. Soon after the accident occurred, and when he first knew there was a possihility of saving his life, he expressed the somewhat snperstitions helief that if the drill were polished and preserved, he would ultimately recover. To gratify hie hnmor, the hoys at the mine every day devoted a little time to the polishing of the drill, and it is now as hright and glisteuing as a uew eilver dollar, and Mulligan is we.l.

The Camp Carson mines, owned hy L. W. Nelson, of Salmon creek, near Baker City, Oregon, are located in the mountains toward the head of Grand Ronde river, and are in charge of Knm Lum, a Chinaman well experienced in mining. He is employing 15 men, hut will soon largely increase the working force. Thie mine hae the fineet water privilege of any mine in Eastern Oregon, and the ditchee cover a vast acreage of the very finest mining gronnd.

The Nevada *Transcript* of July 17th eays: "The Citizens' Bank yesterday shipped to the hay nearly $6,000 worth of gold hullion. It came from some 40 or 50 small claime in various localities hereaboute."

The Ontario Mining Co., is preparing to work 30,000 tons of tailings, which will yield $13.50 per ton.

Arizona Trees.

Our contributor, Prof. J. G. Lemmon, who, as our readers know, passed the early summer in Arizona, in the prosecution of hotanical studies, prepares for the *Arizona Journal* a valuable statement concerning Arizona trees and plants, as learned hy his latest researohes. He writes: Among the most intaresting discoveries made this season in the Arizona mountains are some facts which, though closely conuected interiorly, yet superficially may be put into two classee:

First—Distinct and hence *new* species of plants derived either from extinct families, or else differentiated by ages of isolation from kindred living plants.

Second—Remarkable *varieties*, almost amounting to specific differences, owing to peculiar local and climatic conditions.

Time will admit of only the merest mention of these two propositions, which, with adequate ability, might he elahorated into deeply instructive essays, perhaps.

Of New Species,

Over two dozen have heen detected in the monntains of Santa Catilina alone. These include plants of widely separate orders, from the tiny lichens eud the useful grasses to the lovely ferns and the more consequential shrubs and trees. Precise scientific namee cannot he given to all of these yet, until consultation of the authorities ie had; hnt many readers will not he sorry to mies the difficult Greek and Latin names, notwithstanding their appropriate descriptive eignification to the scientific reader. From the standpoint of utility, we would look at these discoveries from the hottom of the liet indicated, that is, take a glance at the trees and shrubs firet. But one hotanical explorer has before reported maple trees from within the limite of Arizona; yet a

Fine Grove of Sugar Maple,

Which may he dietinct, ie found in the deer park inclnded by the higher peaks of the Catalinas. Also, on the sunny slopee is seen a new and heautiful cypress, detected also hy Mr. Green on the White mountains, northward, I helieve. A sugar maple is reported hy the miners on the north elope of Doe Cahazes, in the Chiricahua mountains, which is perhaps the same as this of the Catalina. The writer has arranged to have leaves and fruit forwarded to him eoon, for determination, and may then report. The maple trees in the Catalinas are some of them one and a half ft. in diameter and 40 to 50 ft. high; of dark smooth hark, and long slender limhs. The leavee and flowere were just expanding when we first came npon the trees, amidst the melting snow banks, on April 30th; hut the treee had heen tapped hy two adventurous pioneers there, and we had a canteen of excellent sap and a fine article of syrup given us. This maple etrongly resemhles *Acer grandidentatum* found in Oregon, hut if it proves to he that species it has made a wonderful skip over the States of California and Nevada, where it is unknown.

Between thie clase of plants and the next stands a large and valuahle pine tree, which until lately was considered a variety of a certain white pine found on the Sierra Madre monntains, Mexico, but of late declared hy the highest authority (Dr. Engelmann) to he a dietinct speciee. This piue resemhles the common eugar pine ot California, but the cones are not half so long and, even when young, the scales are strongly reflected, suggesting the Doctor's new name for the epecies:

"Pinus Reflexa."

It is freqnently met with in the deer park referred to, also on a similar platean on Mount Graham, and ie reported also from several other ranges.

Among the eecond clese of plants—the remarkahle varieties—there is time to mention only one pine. In 1875 Dr. Rothrock, of the Wheeler survey, discovered on the Santa Rita monntains a pine tree having a strong resemhlance to the common yellow pine of California (*Pinus ponderosa*), hnt having its leaves in fascicles of five each, instead of three each, the number in the typical species. Coupling this character with others, derived from the smallness of the cone, etc., Rothrock judged the two to he distinct, and gave it the name of

"Pinus Arizonica."

Though admitting that his "data was very meager." Last autumn, Dr. Engelmann himself, with Prof. Sargent, visited the Santa Ritas, and hoth hecame satisfied that the pine was indeed distinct and entitled to he ranked as a new epeciee. Now, in the large inclosed forest of the Santa Catalina mountaius, we find pine trees of the appearance and description given for the *Pinus Arizonica*, inclnding the long, slender leaves in hundles of five; hnt, nnfortunately for the fate of the new epeciee, some of the leaves are in fascicles of all numhers from two to eeven! On examination of this foreet for eeveral days, every variety of character distinguishing thie polymorphons species was notcd; the eame as in the Sierra of California, with the added features of many-leaved fascicles and very small conee; eo we are compelled to helieve that the eo-called *Pinus Arizonica* is only a form, or, rather, a sport of the *Pinus ponderosa*, so variable in its forms in California as to have received there four or five names from the lumhermen, hnt all epecifically connected hy intermediate forms. Of course, we must not deny that the *Pinus Arizonica* may exist in the Santa Rita mountains, a range some 50 miles sonthward of the Santa Catalina; hnt certainly the presumption ie againet it, and the facts presented, we think, ebow the wonderful transformation powers of isolation and climatic conditions to whicb this speciee has hesn enhjectsd for ages, almost rendering it a distinct species. Fascicles of tbese pine leaves of different numbere and various lengths bave heen eent, accompanied hy the giet of the ahove notes, to Dr. Engelmann, Prof. Sargent, Dr. Parry, and to the California Acedemy of Sciences, from whom we may expect decisive reports.

The State Fair of 1881.

Preparatione for the State fair at Sacramento, Septemher 24th, are going forward, and the outlook for a fino exhibition is good. Ths premium list has already heen issued, and can he had hy addressing the Secretary, E. F. Smith, Sacramento. It shonld he consulted hy all producers, and the hest thinge in each department of production and manufacture eelectod to represent the industries of the State. For the coming session the Central Pacific railroad company will carry all articles and animals exhihited at the fair, over its respective routes, free of charge, and the same company will issue excursion tickets to all parties going to tho fair and returning, at ahout half price. Over $20,000 has been appropriated hy the officers of the society as premiums for the hest exhihits in the several departments of live etock, machinery implements, textile fahrics (mill and domestic products), and juvenile department, mechanical products, and California inventions, designs, etc., agricultural producte, horticultural products and fine arts. Liheral special premiums will be given for all worthy articlas exhibited, not mentioned in the schedule. Also, in addition to the premiums named, the society will give a gold medal to the most meritorious exhihition in each of the departments. Those who desire to compete for the gold medal in any department sbould make spacial entries for that purpose at the time of entering their goods for general premiums, so that the Gold Medal Committee may examine them more closely. The preparatione heing made for the fair are of a good character, and the season prohably will he one of mutual profit for both the society and the public.

A new featnre this year, and one which sbould attract the attention of California girls, is in the fact that J. McM. Shafter, President of the State Agricultural Society, offers a premium of $50 in plate, to the Miss under 18 who, unaided, makes the best loaf of white bread and the hest loaf of hrown bread. This practical contest ehould win many contestants.

Scarlet Snow.

All who have visited the polar regions are familiar with the appearance of red or scarlet snow, in those high latitudes. The broad fielde of everlasting snow that flank the northern coast of Greenland are flanked with the strange hlood red, and farther toward the poles miles of it stretch as far as the eye can reach. Tho phenomenon is due to the preseuce of a minute red animalcule in the snow. A microscope detects its presence, hut how it gets there is a difficult question and one that has never heen quite satisfactorily answered.

Until recently the only place in the United States where this pheuomenon has been ohserved is upward neer the summit of Mount Shasta. But the Leadville *Chronicle* of a recent date states that thie peculiar phenomenon has made its appearance in the Holy Cross county, in Colorado, a very elevated region in that Territory. That paper saye:

"The red snow in tbis region ie first ecen at the head of Cross creek, where it may he ohserved in patchee of intense carmine, varying in area from ae large as a man'e hat to 20 ft. in diameter. Taken in the hand and closely examined, nothing can he deteoted that gives it color, and it melts into clear red water, leaving no stain. Farther on, in some of the steep gulchee, with which the country ahounde, the hottoms are entirely covered with the strange substance. In some placee the color is vivid in the extreme, while in others it fades to a faint pink, producing an effect not readily described in words. Old prospectors who penetrated the regions two years ago, say that there was no snow of this description there, and its fall can scercely have antidated thie year. Still higher, and at the very foot of the monntain, the red snow disappears, and nothing save the pure white coverlet greets the eye. How the same tiny insects that appear in the polar regions can find their way to the inaccessible Holy Cross, is a thing heyond human ken, and will he a problem for the scientists of the future to ponder over."

It is proposed to mine out the hed of the main Stanisleus river, Tuolumne county, from the junction of the South fork, a distance of one-half mile helow. Aleo the South fork from its junction with the main, a distance of one-fourth of a mile or more, will he mined. To effect the object, a large flume will he conetructed, three-fourthe of a mile in length, with a capacity sufficient to carry the waters of both streams.

Last Thnreday a heavy eale of Meadow Lake mining property was made hy Meesrs. H. K. Silvey, Charles A. Giffen and J. B. Giffen, of Trnckee, to the Massachueetts Con. M. Co., of San Francieco.

Up to Jnne 23 the Eureka Con. bad shipped $106,021.40 in bullion.

Montezuma District, Nevada.

A correspondent of the Inyo *Independent* writing from Montezuma, Esmeralda Co., Nevada, says: On inquiry I learned that the camp for many years had been lying idle, for some cause which no one seemed to know. But things have now taken a new start, and the place is on a fair road to be one of the most essential mining camps in the State. The mountains, which bear the same name as the place, were discovered by a party of prospectors from Austin as early as 1867, and several valuable ledges were found which proved on being developed, of sufficient value to attract the attention of capitalists, who erected a 10-stamp mill in 1870. The principal mine found, proved on being more fully developed, to contain smelting ore. This required the building of a smelting furnace to make it pay, and yet matters lay idle for some time for want of capital. Last fall the Shawmut Milling and Mining Co. was incorporated in Boston to operate in Esmeralda county, Nevada. This company took hold of matters and began to push things ahead, but during the winter months very little could be accomplished, owing to the inclemency of the weather. Since spring has opened, however, under the superintendency of Mr. John Howell, well known to many of your readers as a thoroughly good mining man, assisted by Mr. I. M. Taylor, also a practical miner of many years' experience, matters have been pushed forward as fast as men and money could do the work. Good lumber could not be obtained in time in suitable quantities from other sources, therefore a platform was at once erected and saws put in order to commence sawing their own lumber, which was done, out of what is called nut pine. Sufficient lumber of this kind was soon sawed to answer the building purposes of the company very well. The first building to be erected was the smelting furnace. At the same time mines must be worked, good wagon roads made to them, boarding houses and other necessary buildings for the use of the company must be built, and all of which in so short a time has been successfully accomplished.

All things being ready and in good running order, the furnace, which for the last few days has been under the immediate direction of Mr. Thomas, a gentleman of vast experience in such matters, started up on the 21st of June. It was so successful that it surprised the most sanguine hopes of those who had helped at other places. Every part of the machinery was running like a top. Therefore, inside of four hours from the time the fire was first kindled, bullion was run into bars from the raw ore. In 24 hours, more than 70 bars of bullion were run out and piled up near the furnace, where everyone could see for himself. Each bar weighed near 100 lbs. The capacity of the furnace when running at its full speed is said to be 20 tons. Where is there a better showing on the Pacific coast than this has been so far, as indicating a successful mining camp? Yet the outside world does not seem to be aware that there is such a place in existence—that a mining camp is about to "spring up like mushrooms in June," and all without the aid of any newspaper boom, as has been the case with several of its sister camps, on information which said papers called perfectly reliable. I think that the prospects are very flattering indeed for this to be a lively mining camp before the summer months expire.

Every day the ax is heard in the surrounding hills, chopping wood. The smoke can be seen circling its winding way up the different canyons, giving evidence of numerous coal pits in the vicinity. The company at present is employing about 50 men, besides those who are burning coal on contract. The company furnishes wood, hay, etc., delivered to the parties, and pays eight cents per bushel for burning.

Wood River's Need.—The great need of this section at the present time is first-class sampling, smelting and separating works. To be sure there is a smelter in operation within a mile and a half of Hailey, but is only a ten-ton affair, and the company owning it lack the capital necessary to buy the ores offered for sale outright, and the ore producers are therefore compelled to wait fully 40 days before getting their coin. This, of course, deters many from extracting ore, as the claims are for the most part owned by men of no means whatever, who cannot open them up unless the returns are as prompt as sure. Were a strong company, with capital of say $100,000, to begin operations here, the miners would receive their coin on delivery of their ores, and a great impetus would thus be given to the development of the country. Works such as contemplated could not fail to prove enormously remunerative, as they would enjoy a virtual monopoly of the business for two or three years. Other works would soon be erected, to be sure, but the mines are scattered over such a vast extent of country that no crowding in any particular section need be feared.—*Wood River Times.*

An effort is to be made to build, with local capital, a railroad from Napa, Cal., to Lake *via* Berryessa valley. Certain capitalists from other points want to receive subsidies and construct the line, but the people have not accepted the proposition.

The Tuscarora *Times-Review* says: The sump has been cleared out in the Grand Prize shaft, the machinery is running finely, and the work of sinking has commenced in good earnest.

Useful Information.

How Slate Pencils are Made.

In making slate pencils, broken slate is put into a mortar run by steam, and pounded into particles. Then it goes into a mill and runs into a "bolting machine," such as is used in flouring mills, where it is "bolted," the fine, almost impalpable, flour that results being taken to a mixing-tub, where a small quantity of etentite flour similarly manufactured is added, together with other materials, the whole being made into a stiff dough.

This dough is kneaded thoroughly by passing it several times between iron rollers. Thence it is conveyed to a table where it is made into "charges," or short cylinders, four or five inches thick, and containing eight or twelve lbs. each. Four of these are placed in a strong iron chamber or "retort," with a changeable nozzle so as to regulate the size of the pencil, and subjected to tremendous hydraulic pressure, under which the composition is pushed through the nozzle in the shape of a long cord, and passed over a sloping table slit at right angles with the cords to give passage to a knife which cuts them into lengths. They are then laid on boards to dry, and after a few hours are removed to sheets of corrugated zinc, the corrugation serving to prevent the pencils from warping during the process of baking, to which they are next subjected in a kiln, into which superheated steam is introduced in pipes, the temperature being regulated according to the requirements of the article exposed to its influence.

From the kiln, the articles go on to the finishing and packing-room, where the ends are thrust for a second under rapidly revolving emery wheels, and withdrawn neatly and smoothly pointed. They are then packed in pasteboard boxes, containing 100 each, or 10,000 pencils in a shipping box. Nearly all the work is done by boys, and the cost, therefore, is light.

Why Stone Walls are Damp.—The walls of a stone house, and sometimes of a brick house, are covered with dampness. This is due to the very same cause by which dew is deposited on grasses, or moisture on the side of a glass or pitcher that is filled with ice water and is brought into a warm room. The walls become cold, and as stone is a non-conductor of heat, they remain cold for a long time. When the weather changes suddenly from cold to warm, the air becomes filled with moisture, for the warmer the air is, the more moisture it will absorb. When this warm air strikes the cold wall, the moisture is deposited on it from the air, which is suddenly cooled by contact with them, and as the warm air is continually coming in contact with the walls, the dampness accumulates until it appears like a dew upon them and pours down in streams at times. It is easily prevented. No plaster should be put directly upon brick or stone, but furring strips should be nailed to the wall and the lathe be put on these. Cellars are frequently made very damp in the same way by too much ventilation in warm weather.—*N. Y. Times.*

The Bell Clapper.—It has been supposed among antiquarians that the clapper is a modern addition to bells, and that it did not form a part of those employed in Japan and China. Henry O. Forbes, however, writing from Sumatra, says that when in Java a year ago he saw, in the possession of a gentleman there, a bronze bell dug up on the site of one of the old Hindu settlements, of which now only the graves remain. It had lost the clapper, but the hook to which, doubtless, the clapper was attached, existed still.

An Ancient and Unique Cannon.—The Governor of Cyprus has sent to England one of the oldest pieces of ordnance in existence. It is of cast iron, and weighs 25 hundred-weight. Its form is that of a cup or goblet, having the mouth wide and deep to receive a large stone shot, while the pedestal has a much narrower chamber for the powder. This chamber is 7 inches in diameter, extends 30 inches behind the mortar, and terminates in a vent at right angles fully an inch in diameter. It is probably of Venetian manufacture.

Salt is said to be a good preservative of timber. Fourteen years ago a Mr. Sterling, of Monroe, Michigan, placed two gate-posts of white oak in front of his residence. When they were set, he bored into the top of each with an inch and a half auger, a hole three inches deep, filled it with common salt, tightly plugged it, and covered the posts. Having occasion recently to change the location of the posts, he found them as sound, from top to bottom, as the day they were planted.

Cleansing Kid Gloves.—For cleansing kid gloves the following mixture is used in Paris: 200 grams soap powder, 8 grams aqua-ammonia, 135 grams sea de Javelle, 150 grams water. These substances are mixed, and a paste is formed, which, by means of flannel, is applied to the gloves and rubbed until they are quite clean.

To Burn Brick Dark.—While mixing the clay, spray a small quantity of a solution of one pound of common green copperas in four gallons of water. Or, use as a cheap substitute for the above, ordinary acetate of iron liquor.

Plumbing.

At a lecture on plumbing recently delivered before the National Health Society, of London, England, the lecturer commenced by saying that almost everything can now be done by machinery. The United States may be called the forcing-house of inventive genius. They have invented a machine for making a "welded" joint, but it is very inferior to the wiped soldered joint made by hand. Some plumbers never learn how to make perfect joints. In preparing the end of the inner pipe for jointing, all burr should be scraped off; no burr must be allowed to remain. The lecturer then explained the process of making wiped soldered joints. The solder used for upright joints should be finer than that used for underhand joints. To get a true ring round a pipe, a line must be drawn round. Pipes before joining should be well cleansed before applying the solder; "waste not, want not," is an old motto, and a good plumber should think of it in dealing with his solder, and should place the motto round his solder-pot. They should never put more solder round a joint than will be sufficient. Another motto they should remember was that, time is money, and they should study the quickest way of making a joint. In making an underhand joint they should have the pipe well warmed, coax the solder round and round to get the joint symmetrical, afterward they should wipe the joint with all the dexterity they can command, and keep moving the solder round and round on the cloth. One secret of success is to keep the solder close to the iron and keep it well heated by the iron. The plumbers of the commencement of this century did their work very well, much better than some of the present day. Overcast joints are now never made by good plumbers.

A Color Organ.—A musical instrument, called a color organ, has been invented. When the various notes are sounded by touching the keys, different combinations of colors are reflected upon a ground-glass plate, and these change and blend in a charming manner as a quick air is played. Thus two senses are gratified at once, and the beholder feels more than he understands the harmony between melody and color.

A New Test for Wool—Beetles.—A French entomologist asserts that the wool of different countries can be distinguished in market by the beetles which frequent the bales. He has identified 47 species in Australian wool; 52 in South African wool; 30 in South American wool; 16 in Spanish; and 6 in Russian wool.

Good Health.

False Exercise.

We use this term to express a contrast to natural exercise. Every part of the system requires exercise, and in order that exercise may promote health, it should generally be gentle, not violent. Animals, if left to themselves, take exercise that is general in the main; they run, frolic, kick up their heels, and play fight, and thus set an example for human beings, who contrive methods of partial exercise, and thereby produce partial muscular culture, and sometimes overtax one part of the system, while the other parts have too little activity. We have entered gymnasiums and seen young men struggle to put up dumb-balls, weighing perhaps 100 lbs. Now, this requires a very powerful effort, and tends to wrench the spine and produce an undue exertion of a part of the muscles, those of the chest and loins in particular. Some may say that the gymnast alternates the arms; but we answer by saying that because one strains the muscles of the right arm by excessive lifting, there is no reason why he should strain the opposite muscles by undue lifting with the left arm. If men would lift a pair of dumb-bells weighing, say 10 lbs., one in each hand, and then make the use of the muscles equal, simultaneous and harmonious, and all within the just limits of power, it would be much better than to strain and struggle to put up one heavy affair.

A great objection to the usual exercises in the gymnasium is that the chief desire seems to be to outdo everybody else, and only those who are specially well endowed with muscular power make any show at all. * * *

We like what are called "free gymnastics." The horse, the calf, lambs and kids have free gymnastics. * * * Free gymnastics are a series of exercises without dumb-bells, clubs or other apparatus. In this method persons are not obliged to overwork. To practice this let the person stand erect, fill the lungs and strike out first one arm and then the other, then both, then advance one foot and strike out with one hand and then the other, and thus take exercise with the shoulders, arms, back and legs. Persons can thus take abundant exercise and bring themselves to a state of perspiration, and at the same time incur no danger of a strain. In these methods the action of the muscles is harmonious, and may be vigorous or gentle, and always useful; besides, it costs nothing in the way of apparatus or tuition, and can be taken every night and morning and at midday by teachers, students, clerks, literary men, and all girls and women.

A series of such exercises every day would tend to build up the muscular system better than taking irregular exercise at a gymnasium once or twice a week, where one is very apt to be led to over-exercise. When a person is half dressed in the morning, or half undressed at night, he can take exercise that will make the blood fairly tingle in the extremities, relieving the brain and vital organs, especially the digestive organs, and thus promote sleep at night, and growth and vigor during the day. * * *

People as they advance to old age should take easy, active exercise. One who walks considerably, keeps his feet and legs in better condition than those who keep themselves housed up and sit a great deal, or always ride when they can. Nothing shows age more than a tottering step, and he who keeps his legs in good working order by a good deal of walking, manages to keep up a very general circulation, and, of course, promotes the general health, and in this way will avoid many of the pains which age is usually made accountable for. If a man use his bones and muscles as he advances in years, he is not half as likely to fall; or if he fall, to break a bone, because the bones are kept in healthful condition by means of daily exercise. Everybody knows that if the arm be suspended in a sling, from any cause, it becomes soft and flabby. In the same way the bones become weak and brittle by non-use, nature declining to furnish them with food or nutritive support if they are not called into use. If an elderly person can stand well on his feet, be brisk and nimble in walking up and down stairs, he not only has more comfort and independence, but appears better, more vigorous and younger, and isn't half as liable to accidents as those are who, by taking but little exercise, become clumsy, awkward and ungainly in their walk.—*Phrenological Journal.*

Importance of Sleep.

There is no fact more clearly established in the physiology of man than this, that the brain expends its energies and itself during the hours of wakefulness, and that these are recuperated during sleep; if the recuperation does not equal the expenditure, the brain withers—this is insanity. Thus it is that in early English history, persons who were condemned to death by being prevented from sleeping, always died raving maniacs; thus it is also, that those who are starved to death become insane; the brain is not nourished, and they cannot sleep. The practical inferences are three:

1st. Those who think most, who do most brain work, require most sleep.

2d. That the time "saved" from necessary sleep, is infallibly destructive to mind, body and estate.

3d. Give yourself, your children, your servants, give all who are under you, the fullest amount of sleep they will take, by compelling them to go to bed at some regular, early hour, and to rise in the morning the moment they *awake of themselves;* and within a fortnight nature, with almost the regularity of the rising sun, will unloose the bonds of sleep, the moment enough repose has been secured for the wants of the system. This is the only safe and sufficient rule; and as to the question *how much sleep any one requires,* each must be a rule for himself; great nature will never fail to write it out to the observer, under the regulations just given.—*Journal of Health.*

Decay of the Teeth.—The acids which cause the decay of the teeth are conveyed in the secretions of the gums and the mucous membranes of the lips and cheeks, and the penal points of attack are in the interstices and the grooves in the facial walls of the teeth. The calculary nature of the saliva is antagonistic to the acids, and preserves the teeth from their dilapidating influence. Teeth are protected from disease by the following conditions: Their regular shape and order, that the situations for the deposit of acids be as few as possible; the conservation of the teeth from noxious influences by constant brushing; the healthy structure of the tooth itself, and of the mouth generally. Hcider observes that the yellowish white teeth are less subject to the attacks of caries than those of a bluish shade, the enamel of the former being much harder, and the molars have been found to contain more mineral substance than the incisors.

Is It So?—A foreign scientific journal remarks, as a curious physiological fact, that although open-air life is so favorable to health, yet it has the apparent effect of stunting the growth in early youth. Thus, while the children of well-to-do parents, carefully housed and tended, are found to be taller for their age than the children of the poor, they are not so strong in after years; the laborer's children, for instance, who play in the lonely country roads and fields all day, whose parents lock their humble doors when leaving for work in the morning, so that their offspring shall not gain entrance and do mischief, are almost invariably short for their age; the children of working farmers exhibit the same peculiarity. After 16 or 18—after years of hesitation, as it were, the lads shoot up, and become great, hulking, broad fellows, possessed of immense strength. According to these statements, it would seem that indoor life forces the growth at the wrong period, and thus injures. Is it so?

The actual gold yield of California since its discovery in 1848, is a matter that can never be ascertained; but it is of record that the amount deposited in the mint up to 1880 was over $900,000,000.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:
Saturday Morning, July 30, 1881.

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Passing Events.

Among mining men the matter of the pending suit between the Richmond and Albion mine, Eureka, has been a topic of interest. The decision, rendered in favor of the Richmond, is given in another column.

On the Comstock work is going on uninterruptedly, but they are a long time unearthing any bonanza.

At the Belcher the work of cleaning out the drift on the 2500 level, connecting with a drift from the Overman, has been commenced. Now, Supt. Jones is making every exertion to clean out this drift, when he will make connection with the Overman drift by means of an upraise, and thereby secure a good circulation of air at that depth. This connection will allow both the Overman and Belcher to enter and prospect entirely new ground, and it is the intention of the Belcher to do so as soon as a circulation of air is secured that will permit of men working in that direction to advantage. It will take about six weeks to put the drift in condition for work.

We give in this issue the reports of a number of mining companies. We also give a very interesting article on the iron mine in Placer county by Mr. Hauks, State Mineralogist. The number of the new series on "California Geology," by Prof. Blake, will also be found worthy of perusal.

The President continues to improve rapidly and now appears entirely out of danger.

The Mechanics' Institute fair, which opens next week, is an event of importance to all classes, illustrating and indicating, as it does, our industrial progress. The fair opens on Tuesday, and continues for four weeks and four days.

Our readers will be interested in reading the report of Mr. Hamilton Smith, Jr., on the brush dam of the Yuba. From his examination he concludes that it will accomplish the purpose for which it is intended. Col. Mendell also concurs in this opinion. The opinion of these two experts is of more weight than that of all the interested politicians and lawyers put together.

The Mechanics' Fair.

The 16th Industrial Exhibition of the Mechanics' Institute will open on Tuesday next. The opening exercises will be held at the Grand Opera House, Mission street, near Third, at 2 P. M.

This exhibition will probably be the most complete ever held in this city. The manufacturing enterprises of San Francisco are now steadily increasing in number and in importance, and there will be a full representation. Of mining appliances there will be also a pretty full exhibit. At this writing the pavilion is in rather a confused state, but matters are as far advanced as usual at this stage of affairs.

Dewey & Co. have been granted the privilege of publishing the *Fair Daily*, a journal, as its name indicates, devoted to the interests of the 16th Industrial Exhibition. It will contain, in addition to current news of the fair, etc., descriptions of all the important exhibits, and give details which will be of interest to preserve. As the fair is always well attended, we advise people to purchase their season tickets at once before they spend more than one costs.

Silver Amalgamation.

The first works erected in Europe for the treatment of silver ores by amalgamation, appear to have been those described by Schlüter as having been put up at Kingsberg for the purpose of treating the stamped ores of that district.

This apparatus consisted of 18 small cylindrical vessels arranged in a circle, in which the ores were mixed with mercury, and kept in a state of constant agitation by means of a vertical spindle in each tub, the whole being worked by a large toothed wheel in the center. It was not, however, till the latter part of the century that the attention of mining engineers on the Continent became particularly directed to the process of amalgamation. In the year 1780, Phillips says, the Baron de Born suggested to the Austrian government the propriety of adopting this system in the mining district of Hungary, and at his solicitation some experiments were instituted at the Glashutte Works, near Schemnetz.

Although these trials were not followed by the introduction of this system of amalgamation into the Hungarian mines, they nevertheless gave rise to many valuable discoveries, of which the Saxon government, which had deputed a commission to attend on De Born, availed itself in the erection of the works at Freiberg.

The first works were erected at Freiberg, in the year 1790, under the direction of M. de Charpentier, but these were destroyed by fire shortly after completion. The amalgamating works, commenced immediately after the destruction of the former, were completed in 1794, and closed down in 1856. The amalgamating of silver ores was at one time more economically conducted at Halsbrucke Works, in the vicinity of Freiberg, than in any other European establishment.

Tucson District, Arizona.

In conversation, this week, with a miner from the above named district, we learn that the principal drawback to the locality is—what is the case in many other places—the lack of reduction facilities. There have been a great many men prospecting there, but as they cannot get their ore worked, many are now idle.

The district is on the west slope of the Patagonia mountains. The miners hope for some relief from the Atchison, Topeka & Santa Fe railroad, which will probably go along the base of the mountains about 15 miles from Washington Camp.

There is a very heavy mineral belt in these mountains, entirely undeveloped, as yet. The men who get ore out can do nothing with it. There is plenty of timber and water, and the district is quite a large one, being some 15 or 20 miles square. It comprises the Calabasas tract as well. There are several camps in the district.

All the "prospects" are new ones, none of them being developed to any extent. None of the mines are being put on the market. As soon as they are opened up there will be some very good properties indeed.

The ore from the ledges is all free milling, and ledges from 20 to 30 ft. wide are not uncommon. In the larger ledges the ore will run from $50 to $100 and in the smaller ones it runs often from $400 to $500 per ton in silver. The district is reached from Tucson by way of Tuhac, and is easy of access.

This is one of the districts where a man with a good custom mill would help the miners greatly, and probably make a good fortune for himself.

Contributions to the Geology of California.

New Series.—No. 4.

Chinese Camp to Sonora.

H. G. HANKS, STATE MINERALOGIST: In my last communication the course of the mother lode was followed from Coulterville to Chinese Camp, and it was shown that for most of the distance northwest of Penyon Blanco the lode does not crop out strongly, and appears at intervals only. The formations, however, continue unchanged, and the line of the lode is east of Chinese Camp.

Section to Jamestown.

Leaving Chinese Camp and passing northeastward nearly at right angles to the strike of the rocks, we first cross the eroded outcrops of the conglomerates, and then over a belt of slates standing on edge, but presenting an almost flat surface, greatly resembling the outcrops at Merced falls. This smooth and apparent planed-off outcrop is in strong contrast with the sharply serrated edges of the slates standing above the soil like tombstones, generally known among the miners as "grave-stone slates." The difference of surface is very likely due to a difference of internal grain; the absence of the elongated structure made by pulling or stretching the strata during the period of plication, to which we may refer the sharp ellipsoidal outcrops of the slates in a great part of the gold region.

Beyond these outcrops, north and west, there is a belt of greenstone conglomerate, succeeded by serpentine, apparently the prolongation of the serpentine belt traced northwestward from Coulterville and along the Tuolumne. Pliocene gravel also makes its appearance in remnants of a tableland formation, and a short distance beyond, the lava-capped beds of Table mountain bound the view from north to west.

Mother Vein.

Thinly-bedded clay slates come to the surface east of the serpentine, and continue up to the outcrop of the mother lode, about one mile west of Jamestown. The lode at this place crops strongly, and forms the crest of a ridge, upon the flanks of which there are heavy deposits of quartz gravel, evidently derived from the disintegration of the vein. The many pits and trenches in this gravel clearly indicate its valuable auriferous character, and at the same time, show that the vein is not a mere barren outcrop of quartz.

The vein is accompanied by many branches and veinlets penetrating the adjoining slates in various directions. It follows the formation and trends northwest toward Table mountain, under which it disappears. It would be interesting to ascertain what the fineness of the Table mountain gold is, compared with the fineness of the gold from the vein. There can be little doubt that the Table mountain deposit was greatly enriched below the mother vein by the gold broken from its croppings upon the banks and in the bed of the ancient river, along which the deposits and lava overflow of the present mountain were formed.

Jamestown.

The lode is in the midst of the clay-slate formation which extends to and beyond Jamestown. East of this place the slates become harder, more massive, and are traversed occasionally by quartz veins. All the formations trend toward Table mountain, and are there covered from view. As the slates become harder, the surface of the country rises from 1,400 ft. elevation at Jamestown to nearly 1,800 ft. at Sonora. This may be done in part to a very hard dyke of dioritic rock just west of the town. Sonora is built upon hard, massive black slates, resembling those beyond Priest's, and at the Hite mine, belonging, I believe, to the most eastern belt of slates of the Sierra; these black argillaceous slates are firm and hard enough to be quarried for building purposes. They are gold-bearing, and, at the present time, there is a most notable development of a vein within the town limits, from which fabulous amounts of gold are taken by two men, the metal being so abundant that but little crushing in a hand mortar is required to free it from quartz.

Sonora Limestone.

The limestones at Sonora bordering the slate formation on the east, constitute one of the most interesting geological formations of the State. They are here developed over a considerable area and stretch for many miles to the northwest, to Columbia, Shaw's Flat, Murphy's and beyond; and southeastward it is believed to reach to Hite's Cove and beyond it, though I have not traced them in that direction. In a section which I shall hereafter give, from Mariposa to Hite's Cove, I shall show the similarity of the formations; that there are several distinct strata, or beds, and that some of them abound in fossil encrinities. The Sonora outcrops have failed, so far as I know, to give any evidence by fossils of their age or place in the geological scale. There is no doubt, however, of their deep sea marine origin. They show distinct stratification and alternate layers of gray, white and blue color. The stratification is nearly vertical and the beds being of differing degrees of solubility now present a very extraordinary and uneven surface especially where in the flats and valleys they were covered with alluvial gravels and clays. In such places, notably in Columbia and Shaw's Flat, the outcrop consists of a succession of sharp, irregular bodies of limestone, separated by deep, fissure-like chasms. The masses, in many instances, seem like loose bowlders, and where the soil and gravel were removed by mining, they toppled over. Such a surface proved to be wonderfully retentive of placer gold, and the harvest from this strangely irregular surface of limestone was very great. Miners have worked the crevices to great depth, and there is reason to believe that the bottom of many of the chasms has never been reached. A similar formation occurs in the Ural mountains, and was described by Sir Roderick Murchison. A reference to this and a more complete notice of the Sonora deposits, with figures, will be found in my report to the United States Government in 1853 to 1855.

The cause of the uneven surface is not as generally supposed, mechanical wearing away, or erosion, but is chiefly chemical. It is due to the solvent action of carbonated water percolating through the soil or standing in the undrained and swamp-like flats. As the rock was dissolved the gravel and gold sank down into the cavities and crevices far below the surface upon which they were originally laid down.

Pliocene Fossils.

At the time of my first visit, in 1854, the whole limestone belt was populous with miners, and many relics of the Pliocene age were brought to light and were often lost to history and science. These for the most part consisted of teeth of elephants, the mammoths and of the mastodons of primeval days, when they roamed through the forests and glades of California with the tapir and hipparion. Whether the progenitors of the modern Digger Indians were "there to see" is still an open question, though some cracked skulls are thought to bear evidence on this point.

Relics of Humanity.

The late Dr. Snell, of Sonora, was an enthusiastic collector of aboriginal stone implements and relics which have been peculiarly abundant about Table mountain, and were supposed by the doctor to be of great age, even antedating the lava flow. This, however, is very doubtful. As the subject is very interesting, and the facts are important in the discussion of the antiquity of man upon the globe, I propose to make them the basis of a separate contribution.

Since the death of Dr. Snell, his collection appears to have been scattered. I did not find in Sonora, anyone who could give me an account of it. Casts of some of the specimens have been sent to the Smithsonian Institute; and the doctor presented me with a collection of specimens some years before his death. At the same time, I made exact drawings of some of the more important pieces, copies of which I will send you for publication in your annual report.

WM. P. BLAKE.

Prospecting in California.

Mono, Inyo, San Bernardino and Fresno counties now have many prospectors hunting over their mountains in search of quartz. There is a very large area of territory comprised in the region mentioned, where there is room for a good many men to work without tumbling over each other. There are hundreds of billsides and canyons worthy of diligent search and careful examination by experienced prospectors. The rich mines that have not been found are waiting for them. The amount of territory which has only been walked over and never thoroughly prospected, would surprise those who have never done any prospecting and do not know what hard work it is. Many men who have quit work on the hydraulic mines have wended their way southward and started in on the mountains of California looking for quartz.

The following paragraph from the Homer *Index*, published at Lundy, Mono county, shows the direction the prospectors are taking: The prospecting fever is on the increase, and has become epidemic. Every day parties start out on expeditions which they apparently desire to keep secret, but at the time, their destination is as well known as if it were proclaimed by the town crier. Hitchy-Hatchy valley is now the Dorado of imaginative treasure seekers. Wonderful stories of wonderfully rich ledges are current among those who have never seen that rugged and almost inaccessible country, but few of them have any more substantial foundation than guess work. Nothing of value has ever been found in the region where the Tuolumne river has its source; but on the western slope of the Sierras, along the range where the granite of the mountains and the slate belt of the foothills meet, there is a large scope of country which has never been prospected, and where the chances for finding rich veins of quartz are good. Some of the best mines in the State lie between slate and granite.

THE Iron mine, Bristol district, Nevada, is gradually improving as depth is attained. A large body of lead ore has been lately encountered in running south drift from bottom of shaft No. 1. The ore in the face of drift averages $75 to $150 and carries 60% in lead. The drift will be run in on ore for a few days, and then crosscutting will be commenced to ascertain extent of ore body.

THE Hardscrabble mine, Igo, Shasta county, cleaned up the last of June, $12,000,

The Placer County Iron Mine.

An Important New Home Industry.

[Written for the PRESS by HENRY G. HANKS, State Mineralogist.]

No person acquainted with the subject can form a correct idea of the magnitude of the plant required to produce common cast iron economically; or the cost of such works. If informed that several hundred thousand dollars can be used in the construction of a first-class iron furnace, the figures would seem excessive, but in the manufacture of steel, which is simply cast iron purified, the cost of the plant is still greater. A moderately complete Bessemer works is worth $500,000 and upward. Very complete and perfect works at Joliet, Ill., cost $2,250,000.

The modern iron blast furnace is a marvel of scientific and mechanical skill, which seems to have reached a state near to perfection. While its first cost is very great, the vast amount of work that can be obtained from it admits of a satisfactory profit on the capital invested.

The Newly Constructed Iron Furnace

In Placer county is as complete and perfect as can be made by united capital and skill. The name of the company is the California Iron company. The capital employed is owned by the following well-known San Francisco business men—Egbert Judson, Irving M. Scott and A. P. Hotaling. The works are located about six miles from Auburn, and about four miles from Clipper Gap. The exact locality is the northwest quarter of section 15, township 13 north, and range 8 east, Mt. Diablo base and meridian. The mines and furnace—then in an unfinished state—were visited by the State Mineralogist in October, 1880, and again in May 18, 1881 when in full blast.

The furnace is know as a "charcoal hot blast iron furnace." It is a perfect duplicate of one built in 1873, on the Menominee river, which forms the boundary between Michigan and Wisconsin. The California furnace was built by Mr. James M. White, of Rochester, New York, who has proved himself admirably fitted for the work and worthy of the trust. Mr. White has been employed for years at the East in the construction of iron works, and to him is due the entire credit for the building and management of the California furnace. The credit for the inception of the enterprise is due to Mr. P. Fitzhue.

The Early History

Of the Placer county iron deposit is interesting. It was first noticed in 1854 by Mr. S. W. Lovell, then president of the Bear River water and mining company. It was located two thirds in the name of Caleb T. Fay, and the other third for John Bell. In J. Ross Browne's report, published at Washington in 1868, considerable space is given to it, and the attention of capitalists called to its importance. Arrangements had been made at that time with Coffee, Risdon, & Co., to erect a furnace to test the ore, the plan, however, was never carried out. Mr. P. Fitzhue came up in 1874 to examine the deposit, attracted by the report of Prof. Whitney in the volume of General Geology of California, one example of many known to the writer of the practical utility of the State Geological Survey. A company was incorporated known as the "Iron Mountain Iron company." The names of Judge Meyers, J. R. Brown, Geo. Applegate, Chas. Robinson and A. C. Neil, appearing as incorporators. The property came into the possession of the present owners in the winter of 1879-80.

A Blast Furnace Consists

Essentially of two parts. The boshes and the cone, which combined form the column, the full hight of which is 47 ft. The widest part of the interior diameter is 10 ft.

The minute details are technical and cannot be correctly described by one who is not familiar with them. The weight of the upper part of the furnace is supported by massive columns of cast iron, the exterior is of iron lined with fire brick.

From a point near the top, a large boiler-iron pipe called a "down comer" conveys the gases generated in the furnace downward to the hot blast, and to the chamber under the boilers. Gravity doors, or "explosion doors," as they are called, are placed at frequent intervals, which open harmlessly and prevent damage. This is an extremely ingenious contrivance, without which it would be impossible to use the furnace gases found by experience to be both convenient and economical. The gases are brought down to the hot blast and boilers by the natural draught of tall chimneys 100 ft. high. The hot blast arrangement consists of a combustion chamber of 700 cubic ft. capacity, in which 56 tons of iron pipe are coiled, through which 4,000 cubic ft. of air per minute is forced by a compound blowing engine driven by a 125-horse power steam engine. The fuel used is wholly the product of the furnace brought down by the down comer, and burned under the boilers and in the combustion chamber, being regulated by the admission of atmospheric air through a graduated aperture, the management of which requires much skill and experience. As explosive mixtures of gas and air are frequently formed, the before mentioned explosion doors are a necessity. The temperature of the air is readily brought to from 800° to 1,200° at pleasure. At either temperature the pipes are cherry red.

There are five tuyeres entering the furnace at the base of the boshes, through which the powerful red-hot blast is forced beneath the burning charcoal. This blast is kept up (except at short intervals while casting), night and day, as long as the furnace runs.

A small handy engine of 30-horse power does the little chores about the place, the most important of which is the driving at intervals of an Eclipse rock-breaker for reducing the size of the lumps of ore and limestone.

The Upper Part of the Furnace

Is circled by a balustrade of boiler iron, forming an elevated platform above the roofs of the surrounding buildings, like a castle with battlements, upon to the air in all weather, any rainfall being rendered harmless by the great heat. To this level the food of the monster is hoisted. In the center of this charmed circle, ton upon ton of iron ore and bushels of charcoal are cast at short intervals into an insatiable mouth in a succession of carefully weighed charges. The mouth is closed by a conical cover shutting upwards from within, and held in place by a movable lever, which is nearly balanced at the outer end by a weight. When the charge is thrown upon the cover, it slowly sinks, and the coal and iron fall into the furnace down the conical sides of the "bell," as it is technically called. The weight at the end of the lever immediately brings it to its place, the only escape from the furnace being an angry puff of black smoke and an ebon cloud of charcoal dust. This operation intended to be automatic, is assisted at times by a workman, who gently lifts or lowers the lever as occasion may require. The whole furnace is surrounded by an atmosphere of heated air—not unbearable, but tropical above the fer-

THE DATE PALM IN CALIFORNIA.

vency of the summer sun. There are two pipes towering high above the platform, at the end of which a magnificent column of flame, 15 ft. or more in hight, rises like the beacon light of Pharos, illuminating

At Night.

The dark forest and the little village—a glorified gas-burner of gigantic proportions, worth a long journey to see. It has a golden-yellow color, with a tinge of purple, caused with scarcely a doubt by the potassium in the fuel. The effect of this almost monochromatic light on the faces of those on the platform and on the dusky foliage is weird and strange. Each face is ghastly and deathlike, while the night landscape is painted in India ink, all color being degraded by the unearthly light.

While looking at the busy workmen feeding the furnace and scanning the mezzo-tinted landscape, the writer noticed a cloud of light-colored objects drawn toward the gigantic candle, which examination showed to be insects, fascinated, as well they might be, by the glorious lamp, and flying in resistless fanaticism to certain destruction. Countless thousands of silly moths, beetles and night insects of many species and kind, rush in a painted cloud to a fiery death, and carpet the floor of the airy scaffold with their scorched bodies.

A large wire is introduced at intervals into the furnace through a small hole in the hell, by means of which the condition and position of the ore is ascertained.

The Balance Elevator,

An invention of Mr. White, is an ingenious device for raising the ore, charcoal, fluxes, etc., to the top of the furnace, where they are fed into the hopper, and gradually, under the effect of their weight and the fire, sink to the outlet, from which the liquid iron issues at the command of the founder.

This elevator is simply two platforms suspended by a wire rope which passes over an iron pulley under the control of a brake. Under each platform or cage is a tank furnished with a valve, which opens mechanically when the platform reaches the bottom. Into the upper one water is let in from a capacious faucet or valve connected with a large tank placed at a slight elevation. When the weight of the water is greater than the load, the upper platform begins to sink, and the load to rise, the velocity of which is controlled by the brake.

The charges are weighed on a platform scale, the charcoal in a large van on wheels, and the limestone and ore jointly in a smaller car. They are raised on the balance elevator to the top, the ore having been first coarsely pulverized and the charcoal sifted. One charge, equal to 30 bushels of charcoal is fed into the furnace every 20 minutes. The charge of iron is regulated by the accidental quality of the charcoal, the average being 800 lbs.

The Floor at the Base of the Furnace

Upon which the casting is made, is about 50 ft. square. It is divided into two equal parts, each side being used alternately—while the cast iron is cooling on one side, molds are being prepared on the other. The whole floor is covered deeply with sand hauled from Bear river; being tailings from quartz mills, it is nearly pure quartz sand. The floor has a slight incline from the furnace. A shallow canal of damp sand is formed down the gentle slope from the furnace outlet. At right angles from the main canal, at intervals of about six ft., there are secondary canals or channels, from which the ingot molds, also of sand, branch off. This arrangement may be likened to a comb, of which the back is the secondary channel, and the teeth the molds, into which the liquid iron finally settles, forming rough ingots or "pigs," the name by which they are generally known.

One side of the floor is covered with these combs, each at a lower level, to admit of the artificial lava stream filling them in succession, by natural gravity. When all is

Ready for a Cast,

The men take their stations, and the founder taps the furnace by cutting out a clay plug with a crowbar. Presently a glowing stream rushes forth and is guided by the workmen into the first set of sand molds. When this is full, an iron gate is so placed as to cut off the stream, which is coaxed into the next set, and so on until the whole casting is disposed of and the lower part of the furnace is empty. The blast is then stopped, and a new clay plug inserted. The blast is then continued and the work goes on as before. While the furnace is being drawn off the whole upper part is filled with charcoal, limestone and iron ore, in an unfinished state. The writer saw a casting made at night, and it was a rare sight. The interior was illumined by the red-hot iron. The workmen moved to and fro in the lurid light, quietly directing the flow of the lava stream into its arenaceous bed. It was a scene of unusual interest, and a striking illustration of the power of mind over matter.

Twenty-five Tons of Metallic Iron,

More or less, are cast every 24 hours. The metal is claimed to be of excellent quality, superior to any imported. The first cast was made April 24, 1881, at 4 o'clock A. M. One pig from this cast has been sent to the State Museum, where it will ever remain, a historical memento of the inauguration of one of the most important mineral interests of California. At the date of the visit of the writer, 450 tons of iron had been produced without accident or serious impediment, 150 tons had been hauled to Clipper Gap and shipped to San Francisco. The average load by wagon to Clipper Gap was two tons, drawn by four horses, assisted at certain points by an extra span. The average weight of a pig is 80 lbs.

There are five grades of iron produced, No. 1 being soft and tough, and No. 5 white hard iron, the intermediate grades being based in the extremes. The quality of the iron depends on the condition of the furnace, which is under control. Each grade is equally valuable, and it is always known before casting what particular quality will be produced. This is known by the color of the slag, and by an unwritten formula, or tuition, on the part of the founders.

The Slag

Is drawn off every three hours and the metal cast seven times each 24 hours. The smelting operation is continuous. When the furnace is once fired up the work is continued day and night for as long a time as possible—sometimes for two years. When the furnace is "blown out," or for any reason the work is discontinued, it is a costly operation which necessitates a partial reconstruction, for which reason it is economy to continue the run as long as possible.

Twenty Charcoal Ovens,

Or kilns, are required to supply this Moloch with fuel. They are built of brick, 28 ft. high, and about the same diameter; six of them are on the banks of Bear river, two miles from the furnace, and the others at a greater distance. Seven thousand acres of land have been secured by the company to insure a sufficiency of wood and charcoal, and to embrace an area of supposed undiscovered deposits of iron. There is stored in a capacious shed 100,000 bushels of charcoal, laid up to guard against deficiency, and all the kilns are kept at work making more. It was noticed by the writer that a vast amount of pyroligneous acid was going to waste, as were other products of the destructive distillation of wood, which it is hoped will be utilized in the near future.

By a fortunate circumstance

A Large Deposit of Limestone

Has been discovered within a few hundred ft. of the furnace, from which an unlimited supply of that essential flux can be obtained, and its value as a flux is not in the least impaired by the fact that it is also a beautiful, white, saccharoidal marble, suited for ornamental and building purposes. A fine block has been placed in the Mining Bureau which will be cut and polished to test its quality. It seems almost a shame to see such marble cast into the fiery furnace martyr-like in its beauty and purity. This marble has been largely sent to San Francisco, to be used in the manufacture of mineral waters. It can be quarried in large blocks if required. Other deposits of iron ore are continually being found, and a system of prospecting is wisely continued, that an unlimited supply of ore may be mined in advance of the demands of the furnace.

A second large deposit of limonite near Clipper Gap, discovered in 1863 by J. R. Brown, remains untouched. When last seen by the writer, it showed a face in an open cut 60 ft. long and 25 ft. high.

Seventy-five men are employed, exclusive of those engaged as charcoal burners, teamsters, wood choppers, limestone and iron miners, etc. The total number of men to whom employment is given is 150 in summer, and 450 in winter.

As the visitor looks forth from the iron battlements and views the surrounding plant and the busy workmen at the base of the tower upon which he stands, or descends to the sandy floor and watches the streams of molten iron flowing obedient to the will of the iron founder, he not only sees the useful metal divorced at last from its ancient compsuion, *oxygen*, but also mentally pictures the future result of the enterprise so successfully inaugurated. The sluggish stream, slowly forming itself into rough pigs, is the precursor of other iron industries yet to be established, such as the manufacture of California steel rails for future railroads, steam engines, rolling mills, iron ships, mining machinery and tools, great guns for the defense of our coast, Bessemer converters and countless articles of iron made in California workshops, giving employment to our own citizens. The ubiquitous hoodlum disappears, and his place is filled by the busy nail-cutter and the industrious mechanic of the future, proud to earn an honest living and bringing up his happy family in comfort, who is not ashamed of his hard hands and grimy face, and who is reckoned among the respected citizens of a prosperous State.

This picture does not require the aid of a vivid imagination, but naturally follows as a matter of course.

The Date Palm in California.

The date palm is one of the oldest of the vegetable immigrants to California. It has taken a much humbler position in the public thought than the orange, the olive and the grape, which were its attendants hither, and yet it has grown into stateliness and attained the dignity of a landmark in several places. The date has lingered in quiet probably because, though its leaves and flowers appeared freely, its fruit is seldom seen. Why fruit has not appeared, whether owing to the isolation of individual trees and consequent lack of fertilization, or whether other conditions have made it barren, has not, we believe, been fully decided. And yet the date palm has fruited in California occasionally.

The palm shown in the picture is smaller than the veterans at San Buenaventura, but it is of the same species, and serves to show the general characteristics of the *Phœnix dactylifera*. During recent years there has been quite a disposition to plant date palms, and some very handsome groves of young trees may be seen in different parts of the State. It remains to be seen whether they shall prove of any value for fruit bearing.

A NEW survey has been made of the county line between Ventura and Los Angeles counties, and some persons who supposed they lived in Ventura find themselves in Los Angeles county, without having moved.

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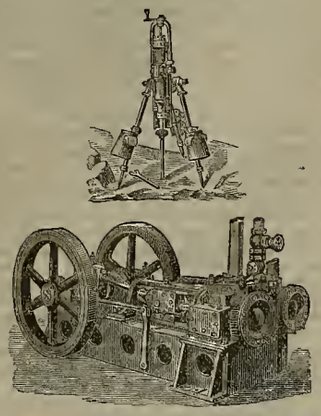

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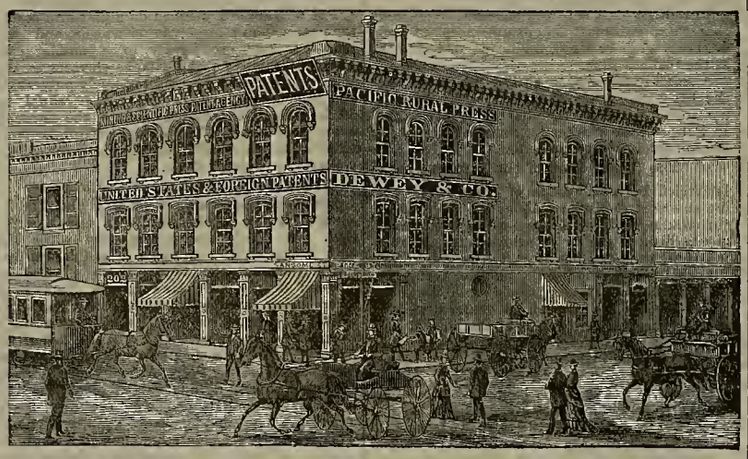

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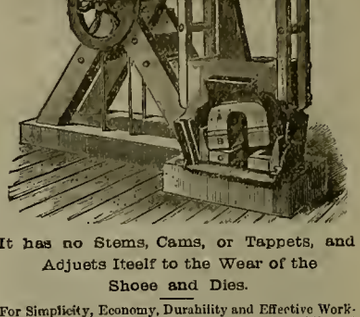

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.]

FOR WEEK ENDING JULY 19TH, 1881.

244,542.—REFRIGERATOR—Bundock & Mapel, Sacramento, Cal.

244,543.—HITCHING CLAMP—J. J. Burke, Walla Walla, Washington Territory.

244,437.—RIVETING MACHINE.—Geo. Cumming, S. F.

244,564.—CONCENTRATING PERCUSSION TABLE.—M. B. Dodge, S. F.

244,389.—BOLTING CHEST—A. P. Gross, S. F.

244,024.—SADDLE GIRTH FASTENING AND HARNESS BUCKLE—Lancaster & Sears, Goldendale, Washington Territory.

244,489.—PILLOW BLOCKS FOR SHAFTS—I. M. Scott, S. F.

244,493.—FRICTION CLUTCH—Budd Smith, S. F.

244,707.—STEAM BOILER—A. M. Wylie, S. F.

244,495.—CAR BRAKE—A. C. Springer, Candelaria, Nev.

244,448.—BALING PRESS.—Jas. N. Grant, Columbus, Nev.

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Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

STEAM BOILER.—A. M. Wylie, S. F. Patented July 19, 1881. No. 244,707. This device consists in a novel construction of a vertical boiler, with means for providing a complete circulation within it, and for exposing water contained within to the action of the heat in the most thorough manner. A tube or pipe extends around inside the ash pit below the grate. This tube is perforated with small holes or nozzles, and receives air from any device which serves to produce a blast through these holes, and thus furnish air for the combustion of the fuel upon the grate above. The amount of air thus furnished is governed by a stop-cock at some convenient point in the supply pipe. From the crown sheet, at the top of the fire box, tubes conduct the heat upward through the water contained in the body of the boiler, and into an open combustion chamber around a lenticular-shaped chamber, which connects with the body by means of a passage, while another cylindrical passage extends to the top of the boiler. From the combustion chamber the heat and products of combustion pass upward around the interior cylindrical chamber and within the outer steam space, escaping at the top. Pipes connect the top of the cylindrical passage with the steam chamber extending down into it, and pipes connect it with the upper part of the body of the boiler. By this construction heat has free access to every portion of the boiler and the pipes conveying the water from one part to another, while, by their construction, a rapid and complete circulation is induced.

CAR BRAKE.—A. C. Springer, Candelaria, Esmeralda county, Nevada. Patented July 19, 1881. No. 244,495. The object of this invention is to provide a means for braking all the cars of a train at the same time by a single operation; this object being accomplished by the application of the device to a common form of brake now in use, which brakes each car independently of the other. The invention consists in a number of extensible connecting rods attached to each car, and operating chains which themselves operate pulleys upon each car and wind up chains which operate the brakes. By this construction the ordinary form of brake attachment is not interfered with, so that either can be applied at will. It can be operated by the engineer or a man in the last car, and, by drawing upon the rods on different sides, both can operate it at once.

RIVETING MACHINE.—Geo. Cumming, S. F. Patented July 19, 1881. No. 244,437. In riveting machines the difficulty has been to regulate the pressure for different work and different sized rivets. The pressure is at present applied directly upon the rivets, and is the same for all kinds of work. Its results are often not satisfactory, for a great pressure applied to a small rivet for thin sheets will press the rivet out of shape and dent end otherwise injure or deface the material to be riveted. This invention has for its chief object the regulating of the pressure applied to the movable jaw, so that by the use of the same power, applied at a different portion of the machine, the power of the movable jaw can be regulated for different work; and it consists in an adjustable steam or hydraulic cylinder, or other power cylinder, so connected with the arm or lever by which the riveting is done that the pressure may be varied and the power accommodated to different kinds of work.

BALING PRESS.—James N. Grant, Columbus, Esmeralda county, Nevada. Patented July 19, 1881. No. 244,448. This invention consists in a peculiar construction and arrangement of conical pulleys whereby the follower is operated with an economy of power; and in a novel construction and means for automatically opening the side doors of the press; and, lastly, in a novel means of securing and opening the top door, and of supporting it in position when opened.

An Improved Step Ladder.

The "United States Champion Ladder," illustrated on this page, and for which a patent has been just granted through the MINING AND SCIENTIFIC PRESS Patent Agency, though simple in construction, excels in strength, utility and portability. It is so constructed that when the two parts—really two distinct ladders—are separated and the pin is in place, it can neither open or shut. The "pin" is the upright stick shown in the engraving, and screwed a double purpose. It is handy as a support when one is upon the ladder. Before the ladder can be folded, this pin must be removed.

The ladder has no useless back, but can be ascended from both sides. In fact, it is two ladders in one, which can be promptly put together to use as one, or taken apart to use as two ladders, as emergency may require.

This ladder is adapted for use by the painter,

"The United States Champion Ladder."

paper-hanger and by mechanics generally, as well as for families, stores, streets or orchards.

W. H. Bray, the patentee, who is manufacturing these ladders at No. 413 Mission street, invites propositions for exclusive rights to manufacture.

The ladder will be exhibited at the Mechanics' fair, which opens next Tuesday, where its merits may be examined.

The Impounding of Debris.

A Report to the Miners' Association of California.

The following official report to the Miners' Association of California, of an examination of the hraah dam on the Yuba river, will be read with interest, coming, as it does, from competent engineers who have thoroughly examined it:

To the Miners' Association of California—GENTLEMEN: I have, at your request, made a professional examination of the dam built by the Commissioners of Drainage District No. 1, across the Yuba river in 1880, and now beg leave to submit the following:

By the courtesy of the State Engineer, I have been furnished with copies of the cross-sections taken at various points above and below the dam and across the Yuba river. These sections were taken in 1880 just before the construction of the dam; were retraced during the present month, and show in detail, with sufficient accuracy, the present condition of the dam and the amount of material which has been lodged immediately above it since it was built.

The dam is a structure of brush laid parallel with the stream, with bending poles laid at right angles and tied together with wire. A brush mattress is placed below the downstream slope of the dam to prevent it from undercutting as the water passes over; the upper slope was protected by tiers of sand-bags. The largest trees used have a diameter of about eight inches. Earth embankments connected the ends of the brush-work with the shore-lines.

The total length of the dam is nearly 10,000 ft.; its greatest hight, 14 ft.; its cost was in the neighborhood of $120,000.

The dam has broken in three pieces, as follows: The earth embankment at the northern end has been washed away nearly down to the original level from the end of the brush-work to the shore, a distance of 400 ft.; the brush dam has been cut away entirely in two places—one 760 and the other 230 ft. in length, measured on the crest; in two places there are small gaps, but with the foundation undisturbed. Out of a total length of 10,000 ft. there has, therefore, been destroyed about one-seventh.

The crest of the dam has settled an average of slightly less than 2 ft.; this apparent settlement is nearly in proportion to the original hight of the structure; that is to say, it is generally greatest where the dam was highest, and has, without doubt, been nearly altogether caused by the compression of the loose brush into a solid mass by the pressure of the water which has passed over the crest. Along the whole length of the dam there are evidences of the large stream which flowed over it; heavy water-soaked logs, of 2 ft. or more in diameter, are still resting on its crest, and the protection mattress, where not covered with sand, shows signs of the rush of the water.

In many places, both on the dam and on the protection mattress, willows are now sprouting and growing; their roots will have a very beneficial influence in matting or tying the whole structure securely together.

It is a notable fact that none of the breaks occurred at the old river channels. The southern break—230 ft. in length—was over an old slough. The bottom at the other breaks was not thought to be comparatively soft or infirm.

The brush mattress below the dam has very satisfactorily answered its purpose in protecting the lower slope of the work from under-cutting.

Causes of the Breaks.

The earth embankment which gave way was in all probability first attacked by water passing with considerable pressure through the interstices of the brush work, and washing away the earth immediately next to the brush bulkhead. After the water had once commenced cutting, as a matter of course the whole embankment soon crumbled away. This supposition is confirmed by the statements of eye-witnesses, and by a knowledge of the injudicious manner in which the earth and brush works were connected.

The breaks in the dam proper were probably caused by strong currents of water sweeping along and undermining the upper or inner slope of the dam, the water escaping through the depressions caused by the compression before alluded to. Small brush buttresses, projecting at right angles up from the dam, would have greatly lessened the danger from any such undermining.

The flood of the past winter, which at its maximum is thought to be greater than the memorable flood of 1861-2, came upon the dam, soon after its completion, with great force. Had there been only the ordinary spring freshet, thus allowing the brush to be gradually filled and compacted with sediment, there would have been much less subsequent compression, and, very likely, the whole work would have stood in its entirety.

The dam was commenced at a late period in the season, and from the necessary haste in which it was built, it was doubtless impossible to devote that care in its construction which would have been taken had there been more time in which to do the work.

Benefits Resulting Already from the Dam.

The sections before referred to, taken across the river, show that:

Feet.						Feet.
50	below dam there has been an			average	erosion of	8-10
50	above	"	"	"	fill of	55-100
¼	mile	"	"	"	"	1 8-10
1	"	"	"	"	"	1 3-10
1½	"	"	"	"	"	1 8-10
2	"	"	"	"	"	4-10
2½	"	"	"	"	"	3-10

Still higher up the river just below Smartsville, the bed is now much lower than in 1880.

The total fill since 1880, for a distance of 3½ miles above the dam, is estimated at 4,851,000 cubic yards.

To my mind the foregoing facts show conclusively that this filling or restraint of nearly 5,000,000 yards has been caused entirely by the presence of the dam, or, in other words, that had not the dam been built, all this material would have been washed still farther down the stream, the larger portion lodging on the slackened grade near Marysville, the residue passing into the Feather river.

The serious breaks in the dam did not occur until the flood had, in a measure, spent its force, so that at the moment when Marysville was in greatest danger of inundation, a notable quantity of water was held back, together with a flow of sand, which would otherwise have materially increased the level of high water.

Judging from the accounts given me of the flood, it seems clear that to this dam Marysville is indebted for its safety during the past winter.

Cost and Advisibility of Repairing the Dam.

The tests to which the work now stands have been subjected are so severe, and the results on the whole so satisfactory in an engineering point of view, that I am convinced that the dam can and should be securely repaired. The breaks should be filled with brush work, similar in general character, but more carefully executed, to the old structure; the dam should be, when settled or compressed, raised to a little above the original hight. When thus repaired, in my judgment, the work will stand the floods, and fully answer the purpose for which it was designed.

A contract can, I think, be made with responsible parties for a sum not over $50,000 who will agree to put the dam in good repair, and only receive their pay in case it stands intact until the summer of 1882. Without such a guaranty, the repairs can be executed for a much less sum.

The estimated storage capacity of the reservoir to be formed by this dam is 41,500,000 of cubic yards; deducting the 5,000,000 of yards now in place, there remains 36,500,000 yards of storage capacity, which can be secured for the comparatively small sum of $50,000 or less.

The State Engineer estimates that the annual flow of material, which can be impounded, down the Yuba river averages about 16,000,000 yards, all the mines being at work. This Yuba dam will therefore, when restored, hold over two years' supply. It is probable that the flow of sand down the Yuba for several years to come will be below the average, as the great flood of the past winter has swept down very much more than the usual quantity.

It has been objected to this dam, that in case of a break, the impounded sands would pour out in a great flood on the lower lands. Were it a reservoir of water, such would be the case, but with a filling of comparatively compact material, any break would only result in the discharge of the sand cut out by the narrow current of water passing through the breach. The large amount of debris held back by the dam, in its present badly broken and incomplete state, is sufficient proof that this objection is practically an unsound one.

Conclusion.

Should this dam be restored, and hold back from the Yuba and Feather rivers the injurious flow of sand and gravel—all of which I believe it will do—the bitter contest now pending between miners and farmers can be brought to an end, before the strife has inflicted irreparable injury on either or both parties.

There is no question but what there is ample room in the Yuba canyons in which to store the mining debris for very many years to come. The magnitude of the mining interest is so great that if it once be shown that the debris can be stored with safety at a reasonable expense, then certainly ways and means will be found for the execution of the necessary engineering works.

Hence, I especially hope that the mining community will do all in its power to have this dam across the Yuba thoroughly repaired, so that its value may be determined with certainty.

It may be well to add that, even supposing mining to be discontinued, still the dam will be of great service in holding back the large deposits of sand and gravel already placed above it in the beds of the river and its branches.

Col. Geo. W. Mendell, of the United States Engineers, has been kind enough to give me the letter which is attached to this report. The views of Col. Mendell will doubtless receive the attention which his high standing in the profession warrants.

Very respectfully, HAMILTON SMITH, JR.
San Francisco, July 27, 1881.

U. S. ENGINEER OFFICE, No. 533 Kearny St. }
San Francisco, Cal., July 27, 1881. }

Hamilton Smith, Jr., San Francisco.—DEAR SIR: I give, at your request, after an examination of the brush dam in the Yuba, my opinion as to its condition and usefulness, past and prospective.

The portion of the dam which is standing, seems to me to be firmly established, and not liable to destruction from the river.

The fact that breaches were made in the dam during the past winter does not impair my confidence in the stability of this kind of construction, and I believe that the breaches can be restored at a moderate cost.

The dam in its present broken condition has arrested considerable detritus, and if restored to its original integrity and hight, must, in my judgment, be efficacious in impounding a large quantity, which, if not thus arrested, cannot fail to do great injury below. I am, very respectfully, your obedient servant,

G. W. MENDELL.

LOWEST DEPTHS.—Following is the lowest depth, in feet, that has been attained at the principal mines on the Comstock:

Utah, bottom of incline, run south from vertical shaft	2250
Sierra Nevada, bottom of joint Union Con. winze	2700
Union Con., bottom of joint Sierra Nevada winze	2700
Mexican, bottom of joint Ophir winze	2860
Ophir, bottom of joint Mexican winze	2360
California and Con. Virginia, each	2500
Best & Belcher, bottom of joint Con. Virginia winze	2300
Gould & Curry, Osbiston shaft	1980
Savage, Hale & Norcross, Chollar and Potosi, each	2400
Julia	2900
Bullion	2800
Imperial Con	2800
Yellow Jacket	3000
Crown Point	2760
Belcher	3090
Overman	2275
Alta	2065
Foreman shaft	1980

PREVENTION OF LEAD POISONING.—People who are engaged in smelting or in dry crushing will be interested in looking at the engraving of the "Life-saving Respirator," which we give in another column. This is a preventive of lead poisoning and guarantee against salivation. It is specially adapted for lead corroding, lead smelting, lead mines, amalgamating and retorting, bullion refineries, quicksilver mines, etc. The instrument is quite simple, and is to be worn over the mouth, nose and chin, for protecting the throat and lungs from dust, obnoxious smells, or poisonous vapors. The air is inhaled through a wet sponge, or cotton, and in expiring, passes out through a valve at the side.

HIGH GRADE.—Another batch of between six and seven tons of Montana ore, shipped to the Bay Horse smelter, gave a return of $2,017 per ton. The Yankee Fork *Herald* complacently asks how that is for high grade ore? That is good for Idaho, but how is this for California? The Ford, McDonald and Muller claim, Nevada county, last week got $22,000 out of 1,579 lbs. of quartz—nearly $14 to the lb. Then 41 loads of rock more yielded $80 a load.

WYOMING MINES.—A dispatch from Cheyenne, (Wyoming Ter.) says: The discovery of copper and silver-bearing ore near Fort Laramie, is creating immense excitement. Miners are stampeding to the new district, which is about six miles wide, and is already swarming with prospectors, all of whom are making locations. The surface assays vary from $60 to $150 per ton. Smelters will be erected at once, as the ore assays from the grass roots.

News in Brief.

SAN BENITO property is assessed this year at $4,128,741.

INYO county assessments this year foot up $1,057,395.

COAL has been discovered about eight miles up the Palouse, W. T.

A CHOTEAU (Montana) merchant has shipped over $100,000 in furs this season.

SOME farmers in Kern county are overrun by the rabbits. One man shot 300 in a week.

AN investigation into the management of the U. S. Branch Mint of this city is in progress.

THE enterprising town of Redding, at terminus of Northern Pacific railroad, has a $10,000 school-house.

THE total assessed value of property in San Diego county this year, after making all deductions, is nearly $7,000,000.

THE foreign Ambassadors refuse the Porte's request to delay the cession of the zone of the ceded territory to Greece.

GRADING on the Eureka and Colorado railroad is to be commenced at once. There is a large force of engineers in the field.

THERE are now more men at work in the mines of the Gold Hill section of the Comstock than at any other time for the past three years.

THE Napa Board of Equalization has denied the application of the railroad company for a reduction of its assessment in that county.

IT is estimated that as much as 1,000 tons of freight intended for Montana, will lay over at Bismarck this winter for want of transportation facilities.

A SURVEY is being made for the route of the proposed narrow gauge railroad from Silver King to the railroad. At last accounts they were at Florence.

THE news from Tunis and Algeria is very conflicting. Some reports represent that quiet is returning, and others speak of new outbreaks, actual or intended.

IN spite of the comments of the Italian ministerial press, there are persistent rumors, in well-informed circles, of an understanding between England and Italy.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none out worthy men.

J. F. OSBORNE—San Francisco.
G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED O. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—Napa, Nevada and Placer counties.
GEO. H. HOPKINS—Amador county.
A. LEONARD MEYER—Utah and Idaho Ter.
C. E. WETMORE—Alameda county.
J. M. WOLFE—California.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F.D., at this office.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We will send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

HOW TO STOP THIS PAPER.—It is not a difficult task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus, terms of subscription, etc., and request that they circulate the copy sent.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francisco.

THE State Mining Bureau, No. 313 Pine street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

COPP'S "U. S. MINERAL LANDS, LAWS, FORMS, INSTRUCTIONS AND DECISIONS."—1881. 570 pp. In full law binding, $4.50; half law binding, $3, at this office.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending this date, the Board of Directors of The German Savings and Loan Society has declared a dividend on Term Deposits at the rate of five and one-tenth (5 1-10) per cent per annum, and on ordinary Deposits at the rate of four and one-fourth (4¼) per cent. per annum, free from Federal Taxes, and payable on and after the 11th day July, 1881. By order, GEO. LETTE, Secretary.
San Francisco, June 30, 1881.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Co.,

Nevada Block, Room 37, San Francisco, July 15, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 69), of Fifty (50) Cents per share was declared payable on WEDNESDAY, July 27, 1881. Transfer books closed until the 21st instant. W. W. TRAYLOR, Secretary.

ASSESSMENT NOTICE.

Consolidated Pacific Mining Company.

ASSESSMENT, NO. 3.

Amount.....Forty Cents per Share
Levied.....July 9, 1881
Delinquent.....August 12, 1881
Day of Sale.....September 1, 1881
F. E. LUTY, Secretary.
Office—Room 5, No. 330 Pine St., San Francisco, Cal.

Arizona Mexican Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Globe District, Arizona Territory.

NOTICE.—There are delinquent upon the following described stock, on account of assessment No 1, levied on the Seventh (7th) day of June, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amount
O R Johnson	180	40000	$24,950 00
O R Johnson, trustee	146	1000	500 00
O R Johnson, trustee	147	1000	500 00
O R Johnson, trustee	148	1000	500 00
O R Johnson, trustee	149	1000	500 00
O R Johnson, trustee	150	1000	500 00
O R Johnson, trustee	151	1000	500 00
O R Johnson, trustee	152	1000	500 00
O R Johnson, trustee	153	1000	500 00
O R Johnson, trustee	154	1000	500 00
O R Johnson, trustee	155	1000	500 00
O R Johnson, trustee	156	500	250 00
O R Johnson, trustee	157	500	250 00
O R Johnson, trustee	158	500	250 00
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O R Johnson, trustee	176	500	250 00
O R Johnson, trustee	177	500	250 00
Geo R Adams, trustee	12	500	250 00
Geo R Adams, trustee	13	500	250 00
Geo R Adams, trustee	14	500	250 00
Geo R Adams, trustee	53	100	50 00
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Geo R Adams, trustee	136	50	25 00
Geo R Adams, trustee	137	50	25 00
Geo R Adams, trustee	138	50	25 00
Geo R Adams, trustee	139	50	25 00
Geo R Adams, trustee	140	50	25 00
Geo R Adams, trustee	179	4000	2000 00
Geo R Adams, trustee	183	16350	$325 00

And in accordance with law, and an order of the Board of Directors made on the seventh (7th) day of June, 1881, so many shares of each parcel of such stock as may be necessary will be sold at Public Auction, at the office of the Company, room 39, No. 320 Sansome street, on Monday, the eighth (8th) day of August, 1881, at the hour of 12½ o'clock P. M., of said day, to pay said delinquent assessments thereon, together with costs of advertising and expenses of the sale.

GEO. R. ADAMS, Secretary.
Office—Room 39, No. 320 Sansome street., San Francisco, Cal.

Wolverine Gravel Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Roach Hill, Placer County, California.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 2, levied on the 31st day of May, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Barnett, Miss Ellen, Trustee	12	300	$30 00
Barnett, Miss Katie, Trustee	15	200	20 00
Barnett, Miss Katie, Trustee	72	100	10 00
Berry, J. H., Trustee	13	100	10 00
Dodge, L. C., Trustee	17	1,000	100 00
Dodge, L. C., Trustee	18	500	50 00
Durning, T. G., Trustee	30	500	50 00
Hall, Edward, Trustee	32	1,000	100 00
Hall, Edward, Trustee	33	1,000	100 00
Myers, W. H., Trustee	10	2,000	200 00
Moyer, Frank, Trustee	16	200	20 00
Moyer, Frank, Trustee	44	75	7 50
Moyer, Frank, Trustee	45	100	10 00
Moyer, Frank, Trustee	74	750	75 00
Mason, H. G., Trustee	21	1,000	100 00
Tilley, W. J., Trustee	39	2,000	200 00
Teel, J. M., Trustee	64	500	50 00
Teel, J. M., Trustee	65	250	25 00
Jones, Wm.	77	500	50 00

And in accordance with law, and an order of the Board of Directors, made on the 31st day of May, 1881, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, 325 Front St., San Francisco, Cal., on Monday, the First day of August, 1881, at the hour of Two o'clock, P. M., of said day, to pay Delinquent Assessments thereon, together with costs of advertising and expenses of the sale. E. J. BLANDING, Secretary.
Office—325 Front St., San Francisco, Cal.

Steep Hollow Gold Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Liberty Hill Mining District, Nevada County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 6) levied on the 21st day of June, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. shares.	Amt.
Jos. Clark	3	50	$75 00
E. A. Richardson, Trustee	25	100	150 00
E. A. Richardson, Trustee	26	100	150 00
E. A. Richardson, Trustee	27	50	75 00
E. E. Dewey, Trustee	50	500	750 00
J. W. Pew, Trustee	55	2250	3375 00

And in accordance with law, and an order of the Board of Directors, made on the 21st day of June, 1881, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the auction rooms of Jno. Middleton & Son, No. 116 Montgomery street, San Francisco, California, on Thursday, the 18th day of August, 1881, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

J. W. PEW, Secretary.
Office, 310 Pine street, room 15, San Francisco, Cal.

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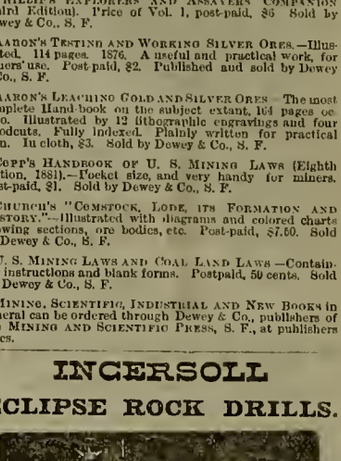

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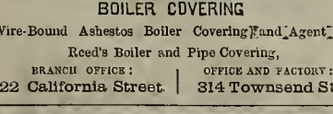

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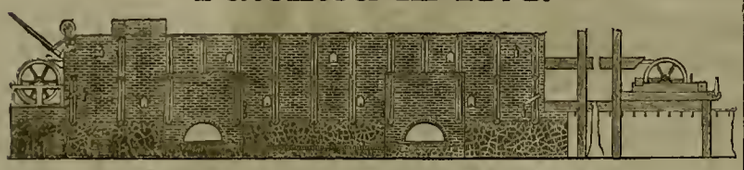

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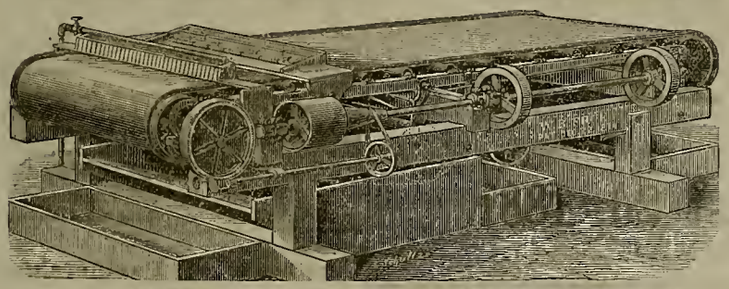

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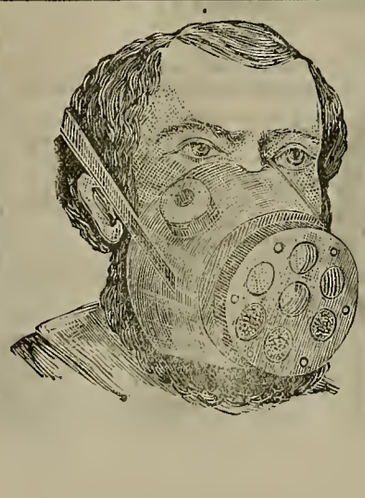

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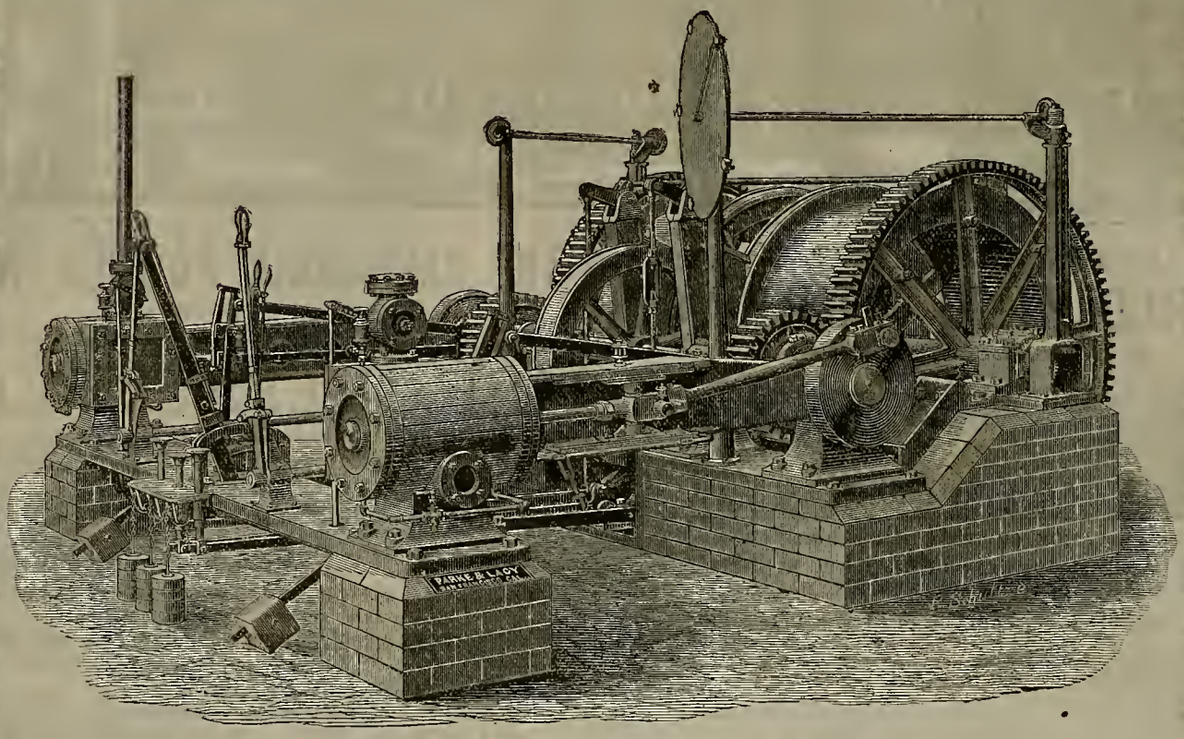

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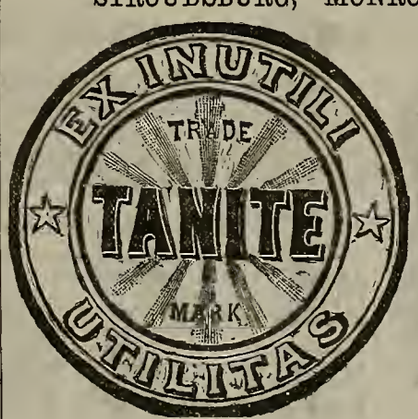

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In witness whereof we have hereunto set our hands this First Day of April, A. D. 1881.

GEORGE SPAULDING,
DWIGHT GERMAIN.

Duly acknowledged, June, 4th, A. D. 1881, before Sam'l S. Murfey, Notary Public.

Endorsed—Filed May 3, 1881.
WILLIAM A. STUART, County Clerk.
By JOHN H. MOTT, Deputy Clerk.

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We certify that we constitute a partnership transacting business as manufacturers and dealers in patent water closets and other sanitary goods, in the State of California. Its principal place of business is San Francisco, California; its name is Milne & Gants; the full names and respective places of residence of all its members are signed hereto.

Dated, San Francisco, July 9th, 1881.

GEO. MILNE, residing at San Francisco Cal.
WM. H. GANTS, residing at Oakland, Alameda County, California.

Duly acknowledged, July 9th, 1881, before W. H. Barton, Notary Public, in and for the City and County of San Francisco, and filed in the County Clerk's office of the City and County of San Francisco, July 9th, 1881. Endorsed: Filed July 9th, 1881. WILLIAM A. STUART, Clerk,
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, AUGUST 6, 1881.

VOLUME XLIII Number 6.

Upper Wood River and Saw Tooth Mines.

(From our Special Traveling Correspondent.)

The mines I have already mentioned in previous letters from this section, are all situated in the Lower Wood River, or Mineral Hill district. Adjoining this on the north is the Warm Springs district, bounded south by Deer creek, and extending up to Bowlder creek. It comprises Greenhorn gulch, Porphyry and Warm Springs creeks, which lie to the west of the river, and East Fork, Bowlder Lake, Trail and Willow creeks to the east. In Greenhorn gulch are a number of important locations, principal among which are the Imporial, Oriental, Greenhorn, Perry and Maud May. The formation is generally granite on one side and slate on the other, with numerous large upheavals of lava on both sides of the gulch. The ores are all galena or carbonates, carrying from 75 to 200 ozs. silver, with an average of nearly 70% lead.

On Warm Springs creek are about 100 locations. The Kelley group, about four miles from Ketchum, comprises five mines which have recently been sold to some Eastern parties for $20,000. They are the West Fork, West Fork No. 2, Yellow Jacket, Black Hawk and Big Beaver.

The next is the Moffitt & Ervin group, on Boyle mountains, comprising some 18 locations, in a formation of talcose slate and lime which is crossed by wide porphyry dykes. On this group two incorporated companies are now operating. The principal developments are on the Ontario, Niagara, North Star and Sunday. The North Star has a tunnel on the ledge which shows all the way from 1 to 22 ft. of ore. One sample taken at a point 48 ft. from the mouth of the tunnel, where there is a crosscut, gave 37 ozs. of silver and $4 gold to the ton. At this place a shaft has been sunk to a depth of 38 ft., with from one to three ft. of good ore against the foot wall. This is a contact vein with a porphyry foot wall and a dolomite limestone on the changing wall. The company are now sinking on the ledge 200 ft. from the mouth of the tunnel and 110 ft. from the surface, where the ore is chloride and carries but very little lead. The vein matter looks as if it was turning into milling ore. They have about 300 tons on the dump, which has all been obtained in running the tunnel and without any stoping whatsoever.

The Ontario is opened in two places about 200 ft. apart, and shows a solid streak of galena from 10 to 30 inches wide. A carload of this ore sampled 142 ozs. silver and 56% lead. The vein is in porphyry formation, running from northeast to southwest, or nearly so, and is decidedly the best looking claim on Warm Springs creek, for the amount of work done.

Four samples taken from different places on the surface of the Sunday, assayed from 31 to 317 ozs., with 65% lead. At one point, an incline shaft has been sunk for 46 ft., showing a 20-inch vein of galena at the bottom.

There are now 12 men at work on these claims, and the force will be increased as soon as the work will justify such a course. They belong to a Boston company, who intend to develop them and some other locations as fast as possible. There is an abundance of good timber and a number of fine springs on the side of the Boyle mountain, in close proximity to the mines.

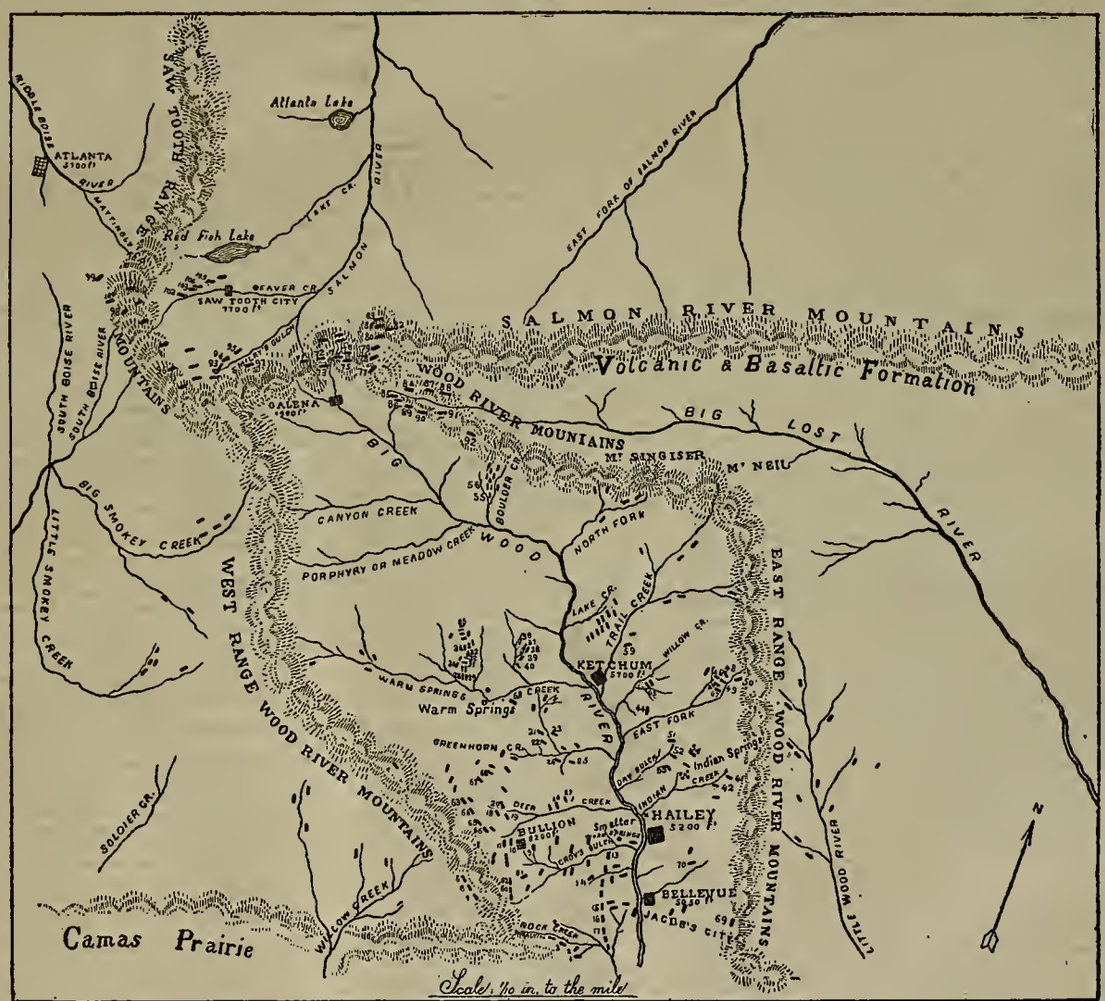
The Black Horse is also owned by a Boston company, and is looking well. It is on the same vein as the Ontario, and is now being opened up. There are a number of other good prospects on Boyle mountain, but they are lying idle, bonded, I believe, to some Eastern parties. There are two parallel veins, located for 9,000 ft., one running through porphyry and the other between porphyry and lime.

On Lake creek are about ten locations, and five miles north of Ketchum, on Bowlder creek and North Fork, are numerous fine prospects, operated by a company from Stockton, Cal., under the superintendency of Dr. Cross.

On Trail creek, which empties into the Wood River close to the town of Ketchum, there are many good locations, but no important developments have been made. The Mountain Lily, owned by Judge Lewis, has produced copper silver glance of a vitreous, metallic luster, assaying as high as 900 ozs. to the ton.

The Elk Horn mine, four miles southeast of Ketchum, was discovered last summer by John Rasmussin, and sold to Judge Lewis for $12,000. It is one of the best mines in this district, and is producing some splendid ores. About 140 tons were shipped from it last year to Salt Lake smelters.

On the east fork of Wood River are the North Star, American Eagle, Silver Fortune, Champion, Boss, Paymaster, Summit, Silver King, etc. The North Star was discovered by William Jaikovski, and is the most promising mine in this section. Large quantities of high-grade ore have been shipped from it, and it now has 200 tons on the dump and probably $25,000 in sight. This property will change hands in a few days.



MINING MAP OF BIG WOOD RIVER—DRAWN FOR THE MINING AND SCIENTIFIC PRESS.

In this district are also the Star Mountain group of mines, consisting of the Ohio, Lulu, Hawkeye, Commodore, Bellevue, Star Mountain, Garfield, Amazon, Empire and Hancock. Some of them are already sufficiently developed to show true fissure veins about two ft. wide, carrying both milling and smelting ore, worth on an average, 120 ozs. The group is owned by the Star Mountain Mining Co., of which Judge Lewis is superintendent, and held to be worth $60,000.

North of Deer creek are the Narrow Gauge, N. G., No. 2, Banner, Kit Carson, Saturday Night and Monumental. The first named has recently been sold to some capitalists, for a round sum.

At the head of Warm Springs creek are the Little Smoky mines, prominent among which are Climax, Carrie Leonard, and several more, assaying from 100 to 3,000 ozs. smelting ore.

Adjoining the Warm Springs district on the north is the Upper Wood River or Galena district, in which some very excellent locations have been made during the last two years. The formation here is also slate and lime, with some porphyry, and the ores will average from 175 to 200 ounces per ton.

The principal locations lie to the north and northeast of Galena city, within a few miles of that town, and are named as follows: Shamrock, Signal, Western Home, Adelaide, White Cloud, Gladiator, Accident, Little Chief, Big Chief, Eunice, Wood River, J. Marion Sims, Baltimore, Dinero, Grand View, Lawrence, Senate, Red Cloud, Independence, Wellington, Leviathan, Highland Chief, Monarch, Our Girl, Clara, Garfield and Serpent; the three last named being incorporated by the Clara Consolidated mining company. Besides these there are some 200 other more or less promising prospects in this district. They are all situated at a very high altitude, ranging from 8,500 to 10,000 ft. above the sea level. As yet no important developments have been made on any of them, but the parties owning the mines are diligently at work opening them up, and with the appearence of the first smelter a new impetus will be given to mining operations on Upper Wood River. The country is heavily timbered and is easy of access, via. Bellevue, Hailey and Ketchum.

On the other side of the high ridge which divides the waters of Wood and Salmon rivers lies Saw Tooth district. The general formation there is granite, and the ores unlike those on Wood River are milling. They are of a high grade, but sufficiently refractory to require roasting. The Pilgrim, Vienna, Columbia, Smiley's, Beaver, Beaver Extension, Lucky Boy, Scotia, Atlanta, Nellie, Sunbeam and Napias are the most noted and best developed mines in this district. The Pilgrim has a shaft 91 ft. in depth, at the bottom of which is a four-foot ore body, paying 100 to 150 ounces per ton. During last winter a tunnel has been run to connect with this shaft, and it has already progressed some 434 ft. The last 30 ft. of this tunnel is on the hanging wall, and shows good ore all the way. A crosscut has just been run to strike the foot-wall, and the result is that a splendid chimney of solid ruby ore has been laid bare. The announcement of this strike has already spread far and wide, and proves that surface indications are nothing to what may be found by going down. The Vienna Co. have run three tunnels on their ledge about 100 ft. apart, one above the other, and are taking and shipping ore running from 250 to 500 ounces. The ledge is four ft. wide, but only about 18 inches of it goes as high as that.

The Columbia, which has considerable rich ore in sight, is not much developed. The other locations enumerated are but partly opened up.

(CONTINUED ON PAGE 89).

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Monument District, New Mexico.

EDITORS PRESS:—This district of Monument is so-called for the reason that its south line is marked by the Monuments dividing New Mexico from the State of Chihuahua. It is about 20 miles from Eureka and 15 from the Carozillio springs, each in New Mexico, and 25 miles south of the Southern Pacific railroad, and about 60 miles from Ianos and Ascension, the nearest Mexican settlements. It was discovered by Volney Rector, of Santa Rosa, Cal., last November, he locating the United States Treasury and the Sub-Treasury mines at that time, in connection with his brother of Oakland, P. Sussman of San Francisco and I. Block, of Alameda. That vein is eix ft. in width, a true fissure, and shows metal its whole length. Assays can he had way up into the thonsands of dollars, hut the generel average of the vein would not be less than 50 ozs. in silver to the ton and probably much more, with 20% galena. Mr. Rector has sunk 5 shafte from 15 to 30 ft. in depth, each of which showing an increase of metal es sunk npon. The Sub-Treasury proves to be in Chihuahua, as is also its extension, owned by Clark Gray and S. M. Wyman, of Chicago, and James T. Cruishank, of Antioch, Cal., all of which have been locatod under the mining lawe of Mexico. Many other mines of great prospective value have been located in the district, both in old and New Mexico. Bnt the district'e greatest difficulty at present is the want of water. The nearest and in great abundaoce is at the Cerozillio, from whence it could he taken to the district by gravitation, firet having to be forced from the epring tc the top of a hill about 200 ft. in hight. Water may, however, be found in sufficient quantity when depth is reached in the mines.

The rock of the country is lime, slate, porphyry and sandstone. The vein matter is black manganese, oxide of iron, feldspar and quartz, although rich deposits have been found in the sandstonc. No oue should come here to prospect without means to supply themselves with water and supplies, as there is no chance at present to obtain work from those who have claims, they having their force employed.

Monument, July 20, 1881. VERITAS.

Theory About the Formation of Universes and the Causes of Planetary Motions.

Written for the PRESS by J. VITAL DE VRY.

Preamble.

Matter and the spirit that governs it are infinite and eternal.

The infinite and eternal epirit or mind, active, is to the eternal infinite matter, passive, like man's mind, like man's soul, forever identical and perfectible, ie to his ever limited and transmutable body.

Attraction, as first agent of tbe Deity, is

Every so-called fixed star, ervey star that glitters by its own eplendor, whether visible or invisible to coeval with matter; and space, the abode of tbe Diety, is without boundaries.

the inhabitants of earth, is the sun and the center of gravity of a solar system or universe, as one may please to call it. A eolar system or universe is a mere spot in the boundless space. The number of univerees is infinite. The sun of each universe is surrounded by a retinue of worlds of diverse ages and eizes, and in different conditions, which revolve around that central globe.

Etherial air fills all space not occupied by more condensete matter. Each universe has its beginning, its youth, its full growth, its decay and its dissolution, and so is it with each of its members.

Formation.

At first, the matter that is to enter into the formation of the globular bodies of a universe, is cool, in a nebuloue state, diffused in the spherical regiou the future universe is to occupy.

When matter begine to take form, atoms, seeking atoms to the extent of their power of attraction, attract one another, and form molecules. Moleculee are likewise agglomerated, and form groups of globules. The globules resulting from these incipient agglomeratione obey the same lawe, and form innumerable globee of a comparatively small eize.

Through similar agglomerations, alwaye caueed and regulated hy the laws of attractiou, larger globes, each composed of a great numher of these primitive globes, are formed. Iu like manner, agglomeratione follow agglomerations, and the globular bodiee decrease in number as they grow in eize, till solar heat, as a eecond agent, is brought in the field to counteract attraction, and put a stop to further conglobation.

While attraction causes these innumerable conglobatione, the universal centripetal force drawe all molecules, globules and globes, irregularly dispersed and wavering throughout the universal epace, toward one common center, with great energy at the very center, and well nigh imperceptibly at the boundariee of the embryonic universe. Hence, at the center, conglomeration goes on with greater rapidity than in the ambient and more remote regions.

At thie universal center of gravity a great mass of plastic matter conglobes, forms a gigantic spherical body, which is soon to be the snn of the new universe. The heaviest particles of matter composing this globular body descend toward the center, and the lighter, the liquid, the oleagenoue and the phosphorescent matter is driven toward the surface.

The emaller globes snrrounding this hnge central globe are powerfully attracted by it, and finally fall into it; and thus, to the extent of their hulks, add to the atomic conetitntion of the growing solar body, which, being drawn toward all points in a sphere's surface, cannot but remain in the center.

Each globe, in its fall, acquires a momentum proportional to its gravity and the space it falls through.

The globes formed at a distance of two or three billions of miles from the univereal center of gravity, as they approach that center, move with the greatest possible velocity toward it; and, finally, in falling into it, strike that body with such violence, that the whole globular mass of matter, etill plastic, is set in a rapidly quivering etate, which causes excessive friction, and friction causes ignition. The colosal central globe, before plastic, tepid and opaque, is now a ball of fire—a sphere shining by its own eplendor, shedding heat and light throughont the nniversal space. It is now the infant eun for the embryonic universe.

Many globes, formed at pointe more distant from the univereal center of gravity, have, in their fall, through the agencies hereafter explained, started their axial and orbital motione; but too late; they have fallen too low; they have come too near the sun; the centripetal power, resulting from thie proximity, cannot be counterbalanced by any centrifugal force the primordial rotatory and volute-like motions of these globes may generate, however rapid these motions may be.

These globes fly, for a short epoch, around the infant sun; not in a circular or elliptical orbit, but in a volute like way, from circumference to centre; and each one ends ite individuality as globe by being absorbed by that central luminary body. Eech globe, at the end of its volute-like flight, as it comes in collision with the sun, strikes that body in a circular—in a tangential—direction, and acts upon it like the driver in a gear acts upon the driven—gives it an impetus that cansee rotary motion. The solar globe, having received similar shocks from all sides, is forced to move in a direction fixed by a combination of the forces these collisions have generated. The rotary motion of the snn generates an annular, ethereal current.

Diurnal or Axial Motion.

The globes formed near the outskirte of the universal space, say at distances of five or six trillions of miles from the solar globe, are likewise heated in proportiou to the concussions they received through a series of conglobations during the process of their formations. They, too, are attracted by, and, slowly at first, but with a gradnally increasing velocity, move—fell rather—toward the colossal central globe; and, like all falling bodies, have their heavier hemiepheres turned toward that universal center of gravity. They gradnally cool as they move through the cold, ethereal air.

Each of these planetery globes, formed at euch enormous distances, arrivee at a point, in its long downward journey, eo near the solar globe that the heat of that luminary body evaporates a part of the water contained in the youug planet'e illumined hemisphere. This hemisphere, till now the heavier, loses a weight equal to that of the moisture extracted from it hy evaporetion, hecomes the lighter; and the other, the upper hemiephere, the heavier; and thus, forced to comply with the demande of attraction, the plenetary globe must, partly at least, turn upon itself iu order to preeent its heaviest part, or side, to tbe universal centre of gravity. In this manner a planet's axial motion commences.

By this incipient rotary motion, other parts of the planet'e surface at the morning side enter into the column of solar heat and move through it during the day; while at the evening side, other parts, equal in longitude, recede from the column of heat, and move through the cooler temperature of the night; so that every part of the planetary surface is alternatively and successively made lighter during the day, by evaporation and exhalation, and heavier during the night, by recondensation and absorption.

In this manner, like an overshot wheel descending at one side with full buckets, and ascending at the other side with empty buckets, the planetary globe ie constantly made heaviest at the side where day commences, and lightest at the opposite side, where day ends and night begine. By thie constant transferriug of weights from the occidental to the oriental eide, the planet ie compelled to continue its rotary motion. Thus its axie, poles, cardinal pointe and diurnal motion are eetahlished.

Orbital Motion.

The constant diurnal evaporation generates a permanent, excessive profusion of atmoepheric vapore at the planet's evening eide; and the equally constant nocturnal recondensation of vapors cansee a permanent quasi-vacuum at ite morning side.

A superabnudance of vapors, of atmoepheric matter means puleion; and the ecarcity or want thereof means traction.

A planetary globe which for ages has been falling through incalculable distancee, which through the universal centrifugal force wae drawn from its native regione, was attracted from the bonndariee of the nniversal space toward the universal center of gravity, can no longer pureue its etraight downward journey; it cannot, like the globee formed in regions less remote, fall into the sun. The planetary globe, fortified by the two forces, its incipient rotation has just brought forth; that is, traction at its oriental eide and pulsion at its occidental side, ie now capable of making the primordial steps in its planetary career. By thie double atmospheric force, the planetary globe is impelled in a route at right angles with the line it has hitherto pursued. It is now forced to deflect from that line, and to move for a while in a volute-like way, from the point of deflection toward tho central globe till, through the combined forces of thie twofold atmospheric impellent and the attractiou of the two globes, eun and planet, exert upon each other, the momentum the planet acquired by its fall is overcome, till the distance between the two globee is reduced sufficiently to found an equilibrium between the impelling and the centripetal forces, till a regular orbit for the young planet is establisbed. The orbit would be circular, were it not made elliptical through the orbital motion of the snn.

Obliquity of the Orbit.

The plane of a planet'e orbit is oblique to the plane of the solar orhit in proportion to the inclination of the planet'e axis to the plane of its orbit; so that one part of the planetary orbital rcnte may be north, and the other, the opposite part, eouth, of the plane of the solar orbit.

The snn, as to its orhital path, is always in the foremoet, in the lower focus of the planetary orbital ellipse.

The elliptical form of ths planetary orbit shows that the dietance between sun and planet must be continually varying; and that therefore, without permanent impellent, a constant equilibrium between the centripetal and centrifngal forces, together with the velocity of the planet'e orbital motion is a mere impossibility. It makes it evident that a permanent impelling force ie reqnisite, ie indespensible to effectuate planetary motione.

To exemplify, let the planet Earth be examined in all its positione and movements.

Thie planet, when in aphelion, is 92,965,489 miles dietant from the snn, and bnt 89,894,951 miles wben in perihelion; the mean distance between the two epheree is calculated to be 92,500,000 miles. The world Earth tnrns npon its axis abont 365 times while it makee one revolution round the sun. When in perihelion it is 23° 28′ north of the sun, and 23° 28′ south of that luminary body when in aphelion. Thns it is plainly seen that there ie a difference of 3,070,538 miles between tbe greater and the lesser distance. It ie also obvione that the planet, in its orbital conrse, makes two movements opposite the one to the other: one from north slightly southward, and the other from south elightly northward.

Now a difference of over three millione of milee in distence must greatly change the efficiency of the attraction the two globes, sun and planet, exert upon each other; it certainly would, in the absence of a permanent impelling force, render tbe regular continuation of all planetary motions impossible. Without the atmospheric impellent these two movements in opposite directions, like all other planetary motions, are simply inexplicable.

The forces that generated, and perpetuate the axial and orbital motions of a planet, being nnderstood, little will he needed to ehow how these two oppoeite motions are caused and regulated by the same agencies, hy the very atmospheric impelling forces.

Iu order to he brief, and to avoid equivocation, it will be proper to make the following remarks:

1st. Let the circle that separates day from night, go nnder the neme of dionox.

2d. Let the point where the atmospheric envelope is thicker than at any other point of that hollow spheroid, he called the point of pulsion; and the opposite point, where the atmosphere is thinest, the point of traction.

3d. Let the eun, as the universal center of gravity, be called the lower of the two globes; and all the parts of the planet, which are nearer the sun than their opposites, be considered as the lower; and the corresponding oppoeite parts, as the higher.

May it be horne in mind, 1st, That the plane of the dionox is alwaye at right angles with a line, drawu from the center of the sun to the center of the planet. 2d. That the poles of the atmospheric epheroid, permanently situated in the dionoxical circle, are always moving spirally over the glacial zones from center to circumference, and *vice versa*. 3d. That the point of traction and the point of pulsion are always eitnated in the equatorial plane of the vaporoue epheroid; the firet point a few degreee below, and the eecond ae far above the dionox; not exactly in that circle, becauee, effects generally, like the tidee for inetance, are posterior to their causes. 4th. That a line running from the one point to the other passes throngb the center of the planetary globe, and that the two atmoepheric forcee—traction ahead and pulsion behind—repreeented by these two pointe, combine to impel the planet in the direction of that line, which through attraction and the enn'e orbital motion ie tranеformed into an ellipee. 5th. That the axial motion of the vaporone epheroid is more rapid than that of the solid ephere, and that tbie difference in speed generatee an aerial current from west to east.

Now, when the world Earth is in perihelion neareet to the snn—when attraction is most powerful—one eeee at a glance that the orhital movement of the planet must have been accelerated in order to generate a centrifugal force adequate to counterbalance the increased centripetal power. Well, as it is with a locomotive, the intenser the heat nnder ite boiler, tbe more steam is generated, and the more steam there is applied to its cylindere, the ewifter the machine epeeds over its track. So ie it with a planet—the nearer the eun it is moving, the more effective is the solar heat npon the planetary globe; the greater the intensity of the eolar heat, the greater is the quantity of moisture extracted from that globe and traneformed into vapors dnring the day; and, inversely, the more vapore are recondensed dnring the night. Consequently, the greater the superabundance of vapore at the occidental eide, and the greater the void at the oriental side of the planet, the more efficacioue is the double atmospheric impellent. Thus, it is evident that the velocity of the orbital motion of a planet is regulated by the atmoepheric impellent, tbe efficiency of which increases in proportion the distance between planet and sun decreases; and, inversely, decreases as the distance increases.

Now, as to the uorthward and southward movements, a diagram representing the planet, with its atmosphere, and its position relatively to the sun, showe that the point of traction lies south, and the point of pulsion north of the planetary equator; the former point heing always below, and the latter alwaye above the dionox; thus, it is plainly seen that the line from the point of pulsion to the point of traction is slightly verging toward the south; and that the planet, while being impelled from perihelion to the vernal equinoxial point, is alro forced to move southward. The velocity of the planet's orbital motiou from perihelion to aphelion sleckens, as the planetary globe diverges farther from the source of heat.

While the planet is impelled from perihelion to aphelion, the two points, representing the acmes of the atmospheric impellant, slowly and in opposite directions move toward the planet's equator, and cross that circle when the earthy ephere passes the equinoxial point, and then again recede from that circle till the planet reachee aphelion. In this point of the orbit, tbe point of traction, at first south, is now north of the planet's equator; and the point of pulsion is now eouth of that circle, while it was north of it when eerth was in perihelion. Here again, the line from the point of pulsion to the point of traction indicates the route along wbich the planetary globe is impelled. It is easy to see that the world Earth is towed and propelled from aphelion slightly nortbward to the autnmnal equinox and thence to perihelion.

In this part of the orbit the velocity of the movement is increasing in proportion the distance between the two globes decreases, in proportion the atmospheric impellent is made more efficacioue.

The eonthward movement from the vernal equinox to aphelion, and also the northward motion from the autumnal equinox to perihelion, partly result from the momenta the planet acquired by its motions from the solstice to the equinoxial points.

At the equinoxial points, when the planet crosses the plaue of the solar orbit, its axis and that of the atmospberic epheroid are in the same line, and the equatore of the two bodies are in the same plane; while, as has been said before, there is an angle of 23° 28′ between the two axes, and an equal angle between the two equatorial planes when the planet is in either of the solstices.

Irregularity of the Diurnal Motion.

When the planet is in either of the solstices, the atmospheric impellent acte upon it, in a direction oblique to its equator and to its meridians. By this indirect action the axial motion of the planet is retarded. And while it is in either of the equinoxial points, the actions of the atmospheric impellent upon the planetary globe are in line with the equator and the parallels of the earth sphere and at right anglee with its meridians. Thus it ie plainly eeen that, as to the diurnal motion, the double atmospheric motive power is most efficacious at those points. It is obvione that at these points, it forces the planet to turn npon its axis more rapidly than at any other point in the orbit. Hence it follows, that the axial rotation is gradually accelerated as the planet moves from solstice to equinox, and retarded as it moves from eqninox to solstice. Be it remembered that effects are seldom instautaneous with, but geuerally posterior to their canses.

The motive power that causes these accelerations is most effective when the planet is impelled from aphelion toward perihelion; whilo then the distance between the planet and the source of heat is gradnally decreasing.

CHINESE SILK.—Silk first came from China, and the Chinese have many important secrets connected with it unknown to Europeans. In a good year they eend as much as $25,000,000 worth of raw eilk to England alone. The "hanke," or booke, as they are called, arrive with cape made of a single cocoon. Thie is done by a procese unknown in Europe.

M. FLEISCHEN has made a compariеon between the bark of young oaks grown reepectively upon eandy loams, upon peaty eoile that had been once burned, and npon a eimilar eoil that had thrice heen hurned, aud found the proportion of tannin highest in the prodnct of peaty soils.

MECHANICAL PROGRESS.

Different Varieties of Steel.

The following correct definitions of the different varieties of steel by William Metcalf, of the Crescent Steel Works, Pittsburg, Pa., are published in a circular by the Dexter Spring Co., of Hulton, Pa.

Originally the word steel was applied only to iron which contained such quantities of carbon as would cause hardening when the red-hot iron was cooled suddenly.

This definition still applies, but, in addition, the term cast steel applies to all of the products of the crucible, the Bessemer converter, and the open-hearth furnace, whether such products are too low in carbon to harden or not. The steels that are not cast steels are known in the market as blister steel, German steel, shear steel, and double shear steel.

Blister steel is made by heating bars of wrought iron, bedded in charcoal, in hermetically sealed chambers. The carbon of the charcoal penetrates the hot iron, converting it into a crystalline mass of crude steel; large blisters rise on the surfaces of the bars, giving the name blister steel to this product.

German steel is blister steel rolled down into bars. It is used mainly for tires and common springs, but is being rapidly superseded by the cheaper grades of cast steel.

Shear steel is made by taking a high heat on blister steel and hammering it thoroughly. Double shear steel is made by cutting up shear steel, piling it, heating it, then hammering it again. The best shear steel must be made from the best wrought iron. The shear steels are very useful on account of their toughness and the ease with which they can be welded to iron, and, when of good quality and well worked, they will hold a very fine edge.

Crucible steel is made by melting in a crucible either blister, or blister steel and wrought iron, and charcoal or wrought iron and scrap steel, or, in short, a great variety of mixtures, which depend on the quality of steel to be produced.

Crucible steel can be applied to any purpose for which steel is used. Generally, it is better than any other steel—that is to say, crucible steel made by melting blister steel and tempered to suit by mixing iron of the same grade in the crucible is always better than German or shear steel made from the same blister.

Bessemer steel is made by blowing air through melted cast iron, thus burning silicon and carbon out of the cast iron. After the silicon and carbon are burned out, melted spiegeleisen or ferro-manganese is added to the charge. The carbon in the spiegel re-carbonizes the steel to the desired point, and the manganese unites with and removes the oxygen which the air used leaves in the steel.

Open-hearth steel is made by melting, in a very hot furnace, a charge of pig iron. To this method, iron, which is called the "bath," is added either wrought iron, or scrap steel, or iron ore, and the whole is kept hot until all is melted. The wrought iron, or scrap, or ore, reduces the carbon and silicon in the bath to such proportions as are desired in the steel.

Bessemer and open-hearth steel are much alike in quality. They are used mainly for rails, boiler plates, ship plates, bridge and other structural purposes and machinery. The better qualities are also used largely for springs. The best spring steel, like the best tool steel, is simply that which is made from the best material. Quality of material, chemically speaking, being equal, the best spring steel is that which is made from crucible cast steel, as the crucible process is less crude than either of the others.

AN IMPORTANT IMPROVEMENT IN GUNNERY.—Mr. Krupp has introduced an important improvement which it is thought may lead to a material reduction in the expenditure on ordnance. All the heavier Krupp guns consist of a steel body strengthened by hoops, the 30½ centimeter guns having three tiers of hoops, the 26-centimeter and 24-centimeter two, and the remainder one tier. The interior of the body, or the bore of the gun, being the part subjected to the greatest wear and tear, becomes rapidly worn out, and hitherto it has been found necessary after, at the very most, 1,000 rounds have been fired, to melt up the whole gun, on account of the damaged condition of the bore, although the outer parts of the piece were practically as good and sound as ever. Since the construction of these outer hoops is very costly, the idea occurred to one of the members of the firm that it might be possible to localize the melting operation, and this it has now been found possible to accomplish by treating the body of the piece with a cold-producing preparation of carbonic acid, which contracts it to such an extent that the hoops, expanded at the same time by the application of heat, can be easily removed.

AN IMPROVED GIN SAW GUMMER has been patented by Mr. John B. Clopton, of Elgin, Texas. The object of this invention is to furnish gin saw gummers, so constructed as to shear off the surplus metal in a solid piece from either side of the teeth, and thus bring the teeth to a point, making all the teeth of a uniform shape and size.

A New Alloy.

Referring to Prof. Thurston's recent experiments with copper tin alloys, the *Engineer* makes some very interesting statements concerning an alloy called "naval brass." It appears that in the early part of 1874, in consequence of numerous cases of failure in respect to Muntz metal in ships of the Royal navy, the attention of the Admiralty was drawn to the subject, and they directed inquiry to be made as to the cause of these failures. Mr. Farquharson, to whom the matter was referred, found that the causes of decay which had been suggested would not account for that which actually took place. In the numerous cases which came under his notice, two conditions of use were always observable, namely, salt water and contact with an electro-negative metal—a fact which pointed strongly to electro-chemical action as the cause of the change. On the other hand, there was a total absence of surface-pitting. To the eye the surface of affected bolts was as smooth and perfect as when they were first made. It was difficult to understand how an internal change, such as actually took place, could come to pass in the way inferred.

Fortunately, a very simple expedient proved beyond a doubt that salt water had *penetrated* an apparently sound and close metal, and the mystery was thus dispelled. Bolts 3½ inches in diameter, which had been used for securing propeller blades, were shown to have been thus penetrated to the center. In view of these facts, the conclusion that a portion of the zinc had been dissolved out was inevitable, and this explanation has been thoroughly verified by comparing analyses of affected and unaffected parts of the same bolts. The circumstance that no such change was to be found in any of the numerous varieties of gun-metal, rendered it probable that it was peculiar to alloys of copper and zinc, so that if a forgeable metal could be produced with tin in its composition, having the requisite strength and ductility, the alloy thus formed would be free from the defect complained of.

In the latter part of the year an alloy, composed of 62 parts of copper, 37 of spelter and 1 of tin, was proposed by Mr. Farquharson, as possessing the requisite mechanical properties. The Admiralty thereupon referred the question as to the endurance of such metal to Dr. Percy, of the Royal School of Mines, in conjunction with Mr. Farquharson. These parties, after subjecting an alloy of this description to severe tests, under which the Muntz metal completely failed, reported to the Admiralty in 1879 that the new compound had stood the tests satisfactorily. Accordingly it was adopted as the service alloy under the title of "naval brass."

The process of manufacture is the same as for yellow or Muntz metal. To insure the best results, Australian or English B. S. copper should be used, and the proportions of metal stated above, closely adhered to, due allowance being made for the loss of zinc in the process of melting. When finished cold, and left unannealed in rods and sheets of moderate thickness, the metal has a tensile strength of from 67,000 lbs. to 72,000 lbs. per square inch, according to the amount of rolling it has received. Bolts of any size can be made of it, the usual practice being to take a rod the size of the bolt required, and to form the head by upsetting in a die. This is done, without stress or injury to the metal, in a bolt or rivet-making machine with heads two diameters of the bolt.

THE COMING MOTOR.—The recent discovery of an improved form of portable electricity seems to have opened anew the inquiry as to what will be the "coming motor." The "Keeley motor" seems, after a brief resuscitation, a few months since, to have again been relegated to the things of the past. In the meantime, Prof. Gamgee is trying to talk and write up his "zero motor." This power is supposed to be developed by some kind of evaporation. It is assumed that the details are set out in his letters patent, but we believe no one, unless it be the professor himself, has yet been found who professes to understand, even from his description, what he has got. To the ordinary mind "it is as clear as mud how he does and how he don't do it." Hence it appears that the dear public must get along as well as it can with ordinary steam until some "new thing" is fairly removed from the realm of the experimental.

IMPROVED ARMOR PLATES.—The armor plates for the new British war vessels are made on a new plan. Around an iron armor-plate backing is placed an iron frame, on the top of which is placed a two-inch plate of iron of the same size as the iron plate. The three pieces having been bound together are brought to a welding heat, and the space between the two plates filled with cast steel. When the whole is cooled it is re-heated and rolled down to the desired thickness. Three rounds from a 125-lb. Palliser gun loaded with 50 lb. charges and fired at a distance of 30 ft., made penetrations of only 5 inches, 4.9 inches and 5.6 inches respectively in one of these composite plates, 8 ft. long, 5 ft. 9 inches wide, and 10½ inches thick.

LOOSE PULLEYS.—Loose pullys require constant attention and much oil, and are very hard on the belt. It is best to have them a trifle smaller than the tight pulley, and with a step or flange running up to the diameter of the tight one. This takes the strain off the belt and the friction from the pulleys.

SCIENTIFIC PROGRESS.

Storage of Electricity.

Mr. Osborn Reynolds, of Owen's College, England, writes to the *London Times* in regard to Sir William Thompson's letter to that paper, of a previous date, as follows:

The means of storing and re-storing mechanical energy form the aspiration of not only Sir William, but of every educated mechanic. It is, however, a question of degree—of the amount of energy stored as compared with the weight of the reservoir, the standard of comparison being coal and corn. Looked at in this way, one cannot but ask whether, if this form of storage is to be the realization of our aspirations, it is not completely disappointing? Large numbers are apt to create a wrong impression until we inquire what is the unit. Eleven million foot-pounds of energy is what is stored in one pound of ordinary coal. So that in this box, weighing 75 pounds, there was just as much energy as in 1½ ounces of coal, which might have been brought from Paris or anywhere else in a waistcoat pocket, or have been sent by letter.

When we come to the question of the actual conveyance of energy for mechanical purposes, this view is of fundamental importance. The weight of the same amount of energy in this new form is 800 times greater than the equivalent amount of coal; and as a matter of economy, supposing that energy in this form might be had at a certain spot and no capital were required for its conversion or storage, and that the energy were directly applicable, it could not be carried 10 miles—that is to say, such energy cannot be economically useful 10 miles from its source, although coal had to be carried 100 miles to the spot. This limit, in truth, falls far short of what has been already attained by other means. By wire ropes and by compressed air or steam, energy may be economically transmitted from ten to twenty miles. So that if this is the utmost of what is to be done by means of the storage of electricity, this discovery adds another door to those which are hopelessly closed against the possibility of finding in Niagara or other water power a substitute for our coal, even when this object is motive power, and much more for that purpose for which five-sixths of our coal is used—the production of heat.

It is very important that the people of this country should not shut their eyes to the fact that so far from there being a greater prospect of the solution of the problem than when, about twenty years ago, Prof. Jevons raised the alarm, the prospect is now much smaller. In the meantime the capabilities of steel ropes, fluids in pipes, and electricity along conductors have been not only investigated, but practically tested and found altogether wanting. And now it would seem that the storage of electricity must be added to the list.

HOW TO DETECT CARBONIC OXIDE IN THE SMALLEST QUANTITIES.—One of the important sanitary problems is to detect in the air of our dwellings very small admixtures of carbonic oxide. The following test, furnished by Vogel, has long been regarded as the most simple and unfailing: To a flask of water exposed to the air under examination, add blood very much diluted. Carbonic acid is shown by the immediate reddening of the mixture. The addition of ammonia sulphide does not banish the absorption lines in the spectroscope as with ordinary diluted blood. The test will show the presence of a portion as small as 0.25 of 1%. Experiments show, however, that the oxide may not all be absorbed in this manner. Dr. Walter Hempel used the lungs of living mice to gather the gas from the room. The mouse experimented upon is then drowned, and blood from the region of the heart is tested with fresh, colorless ammonia sulphide. In this way 0.03 of 1% can be easily detected, and strong symptoms of poisoning are shown with as little as 0.05 of 1% of the gas. Since carbonic oxide is not, like carbonic acid, an unavoidable ingredient of the atmosphere, it becomes a matter of great importance to determine and prevent its presence.—*Scientific American.*

INFLUENCE OF MAGNETISM ON ELECTRICAL CURRENTS.—At a recent meeting of the Physical Society, London, Mr. Hall, of John Hopkins' University, Baltimore, exhibited his experiment in which a current of electricity flowing longitudinally along a thin foil of metal is caused to yield a transverse or lateral current by inserting the foil between the poles of a magnet. The lateral current is observed on a sensitive galvanometer, and care is taken in the first place to find points of connection with the foil which yield no current before the magnet is applied. The results were that if iron is called + the series is iron +, silver −, gold −, platinum −, tin −, and, curiously, nickel, though a magnetic metal like iron, is −; but on inquiry of Prof. Chandler Roberts, it proved that the nickel employed was, perhaps, impure. Cobalt ranges between iron and silver, and is + like iron.

A FRENCH inventor has patented an application of the electric light to the bleaching of textilee and other substances.

No Tarantulas in California.

Mr. Rivers, the well known orator of the Museum of the State University, has been interviewed with the following result:

"Is that hairy, long-legged thing I see in the case, a tarantula?"

"No, there are no true tarantulas in California, but it is what is known on this coast as a tarantula. The tarantula proper belongs to Europe, and especially Spain, and the first-comers here being from that country, and seeing something which, to their unscientific eyes, seemed just the same as their own tarantula, they named it accordingly. Its true name is the trap-door spider, so called from the curious doors they build to close the entrance of their nests. There is one of the nests. You see it has a perfect trap-door lifting on a hinge, and constructed of dirt held together by some mucilaginous substance. It fits tightly into the mouth of the hole, which is a perfect circle. Do you know, it puzzled me greatly when I first came to this coast how that long-legged thing was to get into any of these small holes, which, as you see, are about half an inch in diameter. You see his body above is nearly as large as the hole, and it would be necessary to take off his legs altogether to get him safely inserted in the nest. I thought at first that they were endowed with the power of articulating, or casting off their limbs as some animals do—the crab, for instance—but I afterward found out that these are the males, and they never go into the holes, which are nests and not houses. The female is very much smaller and attends to all that business herself. When she gets through with her husband, she eats him up, I suppose," said Mr. Rivers, with a quiet twinkle, "to see that he does not go wrong afterward."

"How does this species differ from the true tarantula?"

"Do you see those venomous looking nippers or mandibles which turn downward in this spider? Well, in the true tarantula those mandibles extend out horizontally in front of the animal. That is the main difference, and the mistake made by the first-comers to this coast was a very natural one to any but a trained naturalist."

CARNELLEY'S HOT ICE.—The remarkable announcement by Prof. Thomas Carnelley some time ago (which was reproduced in these columns) to the effect that he had been able to heat ice burning hot without melting it, has met with a great deal of scientific scepticism both at home and abroad, although the experiments of Mr. Carnelley were clearly explained and his reasoning appeared to be sound. It is submitted that the result was deceptive in some way, and in the last number of the *Journal* of the Chemical and Physical Society of St. Petersburg, Prof. Boutleroff states that he has carefully repeated Prof. Carnelley's experiments in every particular, but finds that instead of becoming so hot as to be intolerable to the touch, the ice really remained at a temperature of 6 deg. Cent. below zero. Prof. Boutleroff therefore concludes that Mr. Carnelley had raised the temperature of his thermometer without raising the temperature of the ice, and this is the more likely as ice is very transparent to heat, and warm vapor liberated by the melting ice might reach the bulb of the thermometer imbedded in it by small cracks and crevices. In one experiment Prof. Boutleroff accidentally raised the thermometer to + 40 deg. Cent.

EFFECT OF PRESSURE IN CARBONIZING WOOD. Herr Gopport has lately exhibited a piece of pine which has been submitted for two years to a pressure of 12½ tons in a Silesian mine. It had been compressed to one-fourth and converted into a half carbonized state through the action of pressure alone, as little moisture had access, and the temperature was never above that of the surrounding atmosphere. It had quite the appearance of a dark-brown colored bituminous wood of the tertiary brown coal formation, but it was without the smell observed in burning bituminous wood. The change of volume was at the cost of the water-contents of the wood. A considerable amount of oxygen and hydrogen had come off as water, and the composition approximated to that of peat of the older peat formations.

THE American Society of Mechanical Engineers will hold a "midsummer meeting" at Altoona, Pa., August 10th, 11th and 12th. Altoona is high up in the mountains and has some reputation as a summer resort, which an excellent hotel has doubtless helped materially. The place to railroad men is perhaps the most interesting in the country on account of the vast central shops of the Pennsylvania railroad there, which will doubtless be a chief subject of study at the meeting. It is reported that an excursion will be made to visit the Cambria Iron Works, also one of establishments which mechanical engineers will most like to see.

FREEZING MERCURY.—During a lecture recently delivered at the Paris Conservatoire, M. Raoul Pictet coined a medallion in mercury weighing over 33 lbs. The lecture was on "The Industrial Application of Artificial Refrigeration," and the quicksilver was frozen in the Pictet apparatus.

PLATINUM is stated in the books to have the atomic weight 197.2; but Herr Seubert, after much research, concludes that its atomic weight is 194.46.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 14		Week Ending July 21		Week Ending July 28		Week Ending Aug. 4.	
Alpha	2.85	2½	3⅝	2½	3.85	3.60	3.90	3⅝
Alta	4.15	3.55	4.20	3.85	4.65	4.10	4.15	3⅝
Andes	1.55	1¼	1.55	1.30	1.55	1.40	1.45	1.30
Albion	3.95	3.45	4.05	3.10	3.45	1'65	1⅝	1.40
Argenta	10c	5c	10c	5c	10c	....	5c	....
Addenda	15c	....	15c	10c	15c	10c	10c	5c
Belcher	3	2.65	3.15	2.70	3.15	2.80	3.10	2.80
Belmont	....	....	....	....	50c	....	....	....
Best & Belcher	10	6½	10¼	7	11	9½	11¼	....
Bullion	95c	75c	95c	60c	60c	50c	60c	45c
Bechtel	1.60	1.30	1.80	1¼	1.80	1.70	1.45	1'20
Bel Isle	25c	....	....	....	....	....	25c	....
Bodie	7½	6½	7	6¼	7¾	6½	6½	6¼
Bentou	1	90c	1.05	75c	1.15	1	1	90c
Bulwer	2.60	2½	3	2.80	2.80	2.70	2¾	2½
Boston	90c	....	....	....	40c	....	40c	25c
Black Hawk	20c	15c	15c	10c	10c	....	5c	....
Belvidere	50c	....	....	....	....	....	....	....
Booker	5c	....	....	....	....	....	....	....
Caledonia	20c	15c	15c	....	20c	10c	15c	10c
California	80c	65c	80c	70c	80c	70c	90c	70c
Challenge	85c	....	90c	....	....	....	75c	....
Chollar	2.30	2	2.30	2.05	2½	2.15	2.20	2.10
Confidence	....	....	3.85	3.80	3.90	3.60	3.70	....
Con Imperial	20c	15c	15c	10c	15c	10c	15c	10c
Con Virginia	2.15	1.70	2.10	1.95	2.20	1.95	2.15	1¾
Crown Point	2¼	1.95	2.15	1.95	2.15	2	2.05	1.80
Columbus	40c	....	....	....	....	....	....	....
Champion	15c	....	25c	....	....	....	....	....
Concordia	75c	35c	....	....	....	....	....	....
Concordia (Va)	....	....	25c	....	....	....	....	....
Con Pacific	65c	20c	60c	40c	30c	25c	25c	20c
Derbec	....	....	....	....	....	....	....	....
Day	2.15	1.70	2.40	1.90	2.45	2.15	2½	2¼
E. Mt. Diablo	15c	10c	15c	....	15c	10c	15c	10c
Eureka Con	32	31½	31	30½	31½	29½	28	25
Exchequer	1.15	1.05	1.15	95c	1.40	1.10	1.15	1.05
Endowment	....	....	....	....	....	....	....	....
Grand Prize	30c	25c	40c	25c	30c	25c	25c	15c
Golden Gate	2½	....	2.80	2½	2.60	2½	....	....
Goodshaw	35c	30c	35c	....	75c	40c	50c	40c
Gould & Curry	4.85	4.35	4.80	4.20	5⅜	4.60	5½	4⅔
Hale & Norcross	3½	3.20	3.45	3	3.45	3.15	3.20	2.95
Head Center	1½	1.20	90c	....	85c	80c	95c	90c
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	10c	....	....	....	5c	....
Julia	45c	35c	45c	35c	40c	35c	40c	35c
Justice	90c	75c	95c	65c	1	70c	80c	75c
Jackson	30c	....	....	....	50c	....	50c	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	3½	2½	2.65	2½	2½	....	2½	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryau	....	....	....	....	....	....	....	....
Lady Wash	20c	....	25c	15c	25c	15c	20c	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	10c	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattau	2½	....	2.70	....	2½	....	2	....
Martin White	....	....	30c	....	....	....	....	....
McClinton	....	....	....	....	....	....	....	....
Mono	3½	3.05	3½	3	3.05	3	2.70	2½
Mexican	7¾	6½	7½	6¾	7¾	7⅜	8½	7½
Mt. Diablo	8½	8¼	8½	7½	7	5½	5½	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	65c	50c	70c	55c	70c	55c	1	75c
New York	....	....	15c	....	5c	....	10c	5c
Northern Belle	10½	18⅜	18	17½	17	16½	15⅞	12½
North Noonday	40c	20c	30c	20c	25c	10c	55c	50c
Navajo	80c	....	80c	75c	1	60c	75c	....
Occidental	1.20	1.05	1.30	1.20	1.35	1.30	1.40	1.35
Ophir	5½	5	5¾	5½	5⅝	5⅜	5½	5
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.45	1.15	1.35	1.05	1.40	1.15	1.30	1.05
Oro	90c	70c	80c	65c	80c	70c	65c	45c
Paris	....	....	....	....	....	....	15c	....
Potosi	2.55	2.15	2.70	2.35	2.90	2.60	2.60	2.45
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	35c	....	....	....	....	....	....	....
Savage	3	2½	3.05	2.40	2.85	2.55	2.80	2½
Seg Belcher	....	....	6¾	....	7	....	....	6¾
Sierra Nevada	9½	8½	9¼	8½	9¾	9	9½	6¾
Silver Hill	25c	20c	20c	15c	20c	15c	15c	....
Silver King	21¾	21½	21¾	20	21¾	21½	20½	20
Succor	....	....	....	....	....	....	....	....
Summit	30c	25c	25c	....	....	....	30c	25c
Scorpion	1.20	1	1.20	1.10	1.15	1.10	1.35	1.05
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	5c	....	5c	....	5c	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	40c	35c	40c	25c	40c	30c	40c	....
Tioga Con	55c	50c	40c	....	40c	35c	35c	....
Tiptop	4.95	4½	4.90	4.80	5½	4.95	5½	5½
Tuscarora	....	....	....	....	....	....	....	....
Union Con	10	8⅝	10½	8⅜	10½	9½	9¾	8⅜
Utah	7⅞	5⅞	6¾	6	7	6½	8¼	7¼
Ward	....	....	....	....	....	....	....	....
Wales	1½	1	1½	1	1.05	1	1.10	1
Yellow Jacket	4.80	4.10	4.65	4.15	4.70	4.30	4.55	4.05

Sales at S. F. Stock Exchange.

Thursday A. M., Aug. 4.

165	Alta	50	Utah 7⅞
100	Andes 1.35	90	Union 91
15	Alpha 3⅜	115	Yellow Jacket 4.05
	AFTERNOON SESSION.		
150	Benton 90c	200	Albion 1.45@1½
630	Bullion 50@45c	100	Addenda 10c
275	Belcher 2.80@2.85	200	Bodie Tunnel 3.35
10	B & Belcher 9⅜	200	Black Hawk 5c
80	California 85@60c	20	Bodie 6¾
400	Con Virginia 1.20@1.80	250	Bechtel 1.35
120	Chollar 2.20	300	Beldiug 10c
50	Crown Point 1.85	300	Day 2.45@2.40
150	Exchequer 1.10	250	E Mt Diablo 10c
100	Gould & Curry 4.80	85	Eureka Con 19@19½
350	Hale & Nor 3@2.95	250	Grand Prize 20c
250	Mexican 7⅜	100	Goodshaw 40c
140	Ophir 5	250	Holmes 65c
325	Overman 1.05@1	100	Mono 2.50@2½
170	Occidental 1.35@1.30	300	N Noonday 55c
90	Potosi 2½	50	Oro 55c
125	Savage 2.30	10	Silver King 20¼
370	Sierra Nevada 6¾@8⅜	500	Star 35@40c
500	Sutro 15c	100	Syndicate 40c
155	Scorpion 1.30@1.35	560	Wales 1@1.05

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Plumas Water (hydraulic) & M. Co., for July, $10,463; Northern Belle, 27th, $21,891; Mount Diablo, 27th, $6,834, 28th, $8,116; Western, 26th, $20,164; Northern Belle, 30th, $8,211; Ontario, 26th, $16,508; Barbee & Walker, 26th, $1,766; Germania, 26th, $3,629; Hanauer, 26th, $6,818; Wood River, 26th, $2,360; Stormont, 26th, $3,322; Germania, 27th, $2,050; Pascoe, 27th, $1,550; Ophir (Utah), 27th, $2,550; Custor, 27th, $4,267; Ontario, 28th, $10,698; Algonquin (Montana), 23d, $8,500; Germania, 28th, $1,950; Hanauer, 29th, $2,450; Mayflower, 28th, $5,800; Stormont, 28th, $3,940; Barbee & Walker, 28th, $6,076; Christy, 28th, $1,890; Mammoth, 28th, $2,557; Ontario, 28th, $15,480; Spring Valley (hydraulic) Butte county, 29th, $112,000; Mount Diablo, 28th, $8,116; Standard Con., August 1st, $20,625; Northern Belle, 1st, $6,916.

THERE has been a consolidation of foremen on the Comstock, which rednces expenses on the mines from Union to Gould & Curry, by $700 a month.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Aurora M Co	California	3	10	July 5	Aug 6	Aug 31	P Conklin 535 Market st
Addenda M Co	California	5	10	July 17	Sept 6	T H Dixon	238 Montgomery st
Alpha Con M Co	California	14	1 00	June 20	July 25	Aug 15	W Willis 309 Montgomery st
Argenta M Co	Nevada	8	10	July 7	Aug 11	Sept 2	E M Hall 327 Pine st
Bulliou M Co	Nevada	20	60	July 21	Aug 25	Sept 15	J M Brazoll 328 Montgomery st
Belmont M Co	Nevada	29	15	July 27	Aug 30	Sept 26	J W Pew 310 Pine st
Best & Belcher M Co	Nevada	21	50	July 12	Aug 18	Sept 7	W Willis 309 Montgomery st
Caledonia M Co	Nevada	36	25	July 7	Aug 13	Aug 31	R Wegener 414 California st
California M Co	Washee	1	30	June 30	Aug 6	Aug 25	C P Gordon 309 Montgomery st
Con Pacific M Co	California	3	40	July 9	Aug 1	Sept 1	F E Luty 330 Pine st
Gould & Curry S M Co	Nevada	40	50	July 15	Aug 19	Sept 8	H K Durbrow 309 Montgomery st
Gila S M Co	Nevada	8	25	July 22	Aug 22	Sept 6	J T McGeoghegan 318 Pine st
Hale & Norcross S M Co	Nevada	50	100	July 12	Aug 18	Sept 7	J F Leather 309 Montgomery st
Leeds M Co	Utah	5	25	June 17	July 28	Aug 22	D B Chisholm 327 Pine st
Mexican G & S M Co	Nevada	16	1 00	June 28	Aug 2	Aug 22	C L McCoy 309 Montgomery st
Maybelle Con M Co	California	8	20	June 22	July 29	Aug 22	W J Taylor 310 Pine st
Martin White M Co	Nevada	10	25	June 18	July 30	Aug 25	H L Scoville 309 Montgomery st
Murchie M Co	California	6	15	June 10	July 11	Aug 10	S D Rogers 328 Montgomery st
Mariposa L & M Co	California	21	1 00	June 8	Aug 10	Sept 7	L Leavitt 309 Montgomery st
Northern King M Co	Arizona	6	25	July 8	Aug 13	Sept 5	E A Holmes 318 Pine st
North Bloomfield Gr M Co	California	44	1 00	June 23	July 29	Aug 17	H Pichoir 320 Sansome st
Oneida M Co	California	15	3 00	July 21	Aug 29	Sept 20	H P Bush 431 California st
Overman M Co	California	50	July 20	Aug 24	Sept 14	G T Edwards	414 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona Mexican M Co	Arizona	1	50	June 7	July 15	Aug 8	G R Adams 320 Sansome st
Betty O'Neal M Co	Nevada	1	50	June 14	July 19	Aug 9	R W Heath 318 Pine st
Black Hawk M Co	California	12	10	July 15	Aug 19	Sept 9	H A Charles 419 California st
Con El Dorado M Co	Nevada	2	10	June 27	Aug 12	Aug 13	J M Buffington 330 California st
Eintracht Gravel M Co	California	7	5	June 14	July 21	Aug 9	H Kunz 209 Sansome st
Harrington M Co	California	2	5	June 15	July 20	Aug 12	I O Miller 409 California st
Holmes M Co	Nevada	2	10	June 22	July 25	Aug 15	E A Holmes 318 Pine st
Iowa M Co	Nevada	14	05	July 27	Sept 12	Oct 5	C S Leavitt 411½ California st
Iron Clad Con M Co	California	1	01½	May 25	July 10	Aug 10	A Dott 309 Montgomery st
Lodi M Co	Nevada	3	05	July 19	Aug 22	Sept 12	A B Paul 328 Montgomery st
May Flower G M Co	California	12	10	July 19	Aug 23	Sept 13	J Morizo 328 Montgomery st
Morgan Gold	California	7	50	July 8	Aug 16	Sept 13	J Learny at 533 Learny st
Mount Potosi M Co	Nevada	—	10	June 9	July 29	Aug 22	H Sayre 330 Pine st
New York M Co	Nevada	26	10	July 16	Aug 18	Sept 8	D L Thomas 327 Pine st
Noonday M Co	California	3	50	June 28	Aug 3	Aug 26	Wm J Traylor 310 Pine st
North Noonday M Co	California	3	50	June 28	Aug 5	Aug 29	Wm J Traylor 310 Pine st
North Gould & Curry M Co	Nevada	1	25	July 15	Aug 15	Sept 6	N O Southard 331 Montgomery st
Paris M Co	California	2	25	June 22	July 27	Aug 17	W J Taylor 310 Pine st
Paris M Co	California	2	25	June 22	July 27	Aug 17	Wm J Traylor 310 Pine st
Rocky Point M Co	California	8	05	June 21	July 25	Aug 15	W G Hughes 330 Pine st
Red Cloud Gou M Co	California	10	20	June 22	July 27	Aug 17	W J Taylor 310 Pine st
Sierra M Co	Nevada	69	1 00	July 15	Aug 18	Sept 6	E L Parker 309 Montgomery st
Steep Hollow G M Co	California	6	1 50	June 21	July 26	Aug 18	J W Pew 310 Pine st
Spaulding G & S M Co	California	2	10	June 28	Aug 23	Sept 15	J W Pew 310 Pine st
Union Con M Co	Nevada	17	1 00	July 1	Aug 4	Aug 24	J M Buffington 329 California st
Union Con M Co	Nevada	17	1 00	July 1	Aug 4	Aug 24	J M Buffington 309 California st
Union Gravel M Co	California	17	50	June 28	Aug 4	Aug 25	H Pichoir 320 Sansome st
Utah S M Co	Nevada	35	2 00	June 28	Aug 5	Aug 23	G G Pratt 309 Montgomery st
Wide Awake M Co	Arizona	13	10	June 4	July 18	Aug 10	C Hildebraudt Cor Bush & Monty

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Columbus Con M Co	Nevada	H T Thurman	411 California st	Annual	Aug 9
Independence M Co	Nevada	E M Hall	327 Pine st	Annual	Aug 15
Julia Con M Co	Nevada	H A Charles	419 California st	Annual	Aug 10
Navajo M Co	Nevada	J W Pew	310 Pine st	Annual	Aug 9
Navajo M Co	Nevada	J W Pew	310 Pine st	Annual	Aug 9
Occidental M Co	Nevada	A K Durbrow	319 Montgomery st	Annual	Aug 8
Rocky Point M Co	California	W G Pugh	320 Pine st	Annual	Aug 15
South Comstock Con M Co	Nevada	J M Buffington	309 California st	Annual	Aug 15

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	July 20
Father De Smet M Co	Dakota	H Dean	New York	50	June 10
Northern Belle M & M Co	Oal	Wm Willis	309 Montgomery st	50	July 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	July 15
Silver King M Co	Arizona	J Nash	315 California st	25	July 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	July 12
Western M Co	California	C S Curtiss	309 Montgomery st	75	May 12

The Mining Share Market.

The mining share market is not in an active or lively state, yet dividends are being paid hy many mines. The following mining dividends, says the *Bulletin*, have been disbursed, principally in San Francisco, during the first half of the current year:

	No.	Amount.
Deadwood-Terra, Dakota	6	$ 280 000
Eureka Con, Nev	6	150,000
Father de Smet, Dakota	4	100,000
Great Western Quicksilver, Cal	1	12,500
Homestake, Dakota	6	180,000
Idaho, California	6	124,000
Indian Queen, Nevada	6	38,750
Navajo, Nevada	1	25,000
New York, California	6	60,000
Northern Belle, Nevada	6	187,500
Napa Con. Quicksilver, California	2	20,000
Ontario, Utah	6	375,000
Silver King, Arizona	6	120,000
Standard Con, Cal	6	450,000
Western, Arizona	6	450,000
Totals	77	$2,002,750

These 15 mines in the course of six months have done a trifle better than the California and Con. Virginia used to do in one month. It is proper to remark that the Deadwood-Terra, Father de Smet, Homestake, Indian Queen, Napa Con. and Ontario mines disburse their dividends very largely in New York and Boston.

In connection with the foregoing it is well to give the mining dividends paid during the same interval in New York and other places. For a statement of these we are indehted to the *Mining Record* of New York. The list is as follows:

	No.	Amount.
Alice, Montana	4	$ 160,000
Boston & Montana, Montana	4	80,000
Consolidated Gold, Georgia	2	8,000
Catalpa, Colorado	3	180,000
Calumet & Hecla Copper, Michigan	2	1,000,000
Central Copper, Michigan	1	60,000
Dunkin, Colorado	6	110,000
Evening Star, Colorado	7	175,000
Gold Stripe, California	3	67,500
Green Mountain, California	6	53,125
Glass-Pendery, Colorado	1	25,000
Hibernia, Colorado	4	120,000
Iron Silver, Colorado	2	200,000
La Plata, Colorado	6	90,000
Plumas-Eureka, California	1	105,000
Polonia, Colorado	1	12,000
Osceola Copper, Michigan	2	150,000
Quincy Copper, Michigan	1	200,000
Richmond Con. Nevada	2	270,000
Robinson, Colorado	1	50,000
Rising Sun, California	2	25,375
Sierra Buttes, California	1	30,000
Spring Valley, California	1	50,000
Starr-Grove, Nevada	6	120,000
Tombstone, Arizona	6	300,000
Totals	75	$3,641,500

The sources of these dividends are as follows:

Location.	Mines.	Dividends.
California	11	$ 908,000
Nevada	6	701,250
Utah	1	375,000
Arizona	5	900,000
Dakota	3	500,000
Colorado	9	962,000
Montana	2	240,000
Michigan	4	1,410,000
Georgia	1	8,000
Totals	40	$6,244,250

Nearly half of the amount from the California mines came from the Standard Con. in Mono county. The Richmond Con. paid nearly one-third of the Nevada dividends.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

ORO GRANDE M. Co.—July 19. Location: Roses Bar, Yuba county, Cal. Capital, $10,000,000. Directors—W. H. H. Hussey, R. J. Graham, C. J. Smitb, B. Gallagher and A. Hay.

ITHACA CON. M. Co.—July 20. Location: Arizona. Capital, $6,000,000. Directors—John Jeffrey, J. T. Hall, Wm. Grainger, W. W. Hickiss and F. C. Cravens.

ASTOR CON. M. Co.—July 22. Capital, $600,000. Directors—J. Jeffrey, J. T. Hall, W. Grainger, W. O. W. Hickiss and F. C. S. Cravens.

ASTOR CON. G. & S. M. Co.—July 22. Location: Storey county, Nev. Capital, $10,000,000. Directors—B. F. Dahl, V. Rossayze, M. C. Southard, C. H. Redmond and S. Purdy.

CALIFORNIA CENTRAL RAILWAY Co.—July 25. The road is to run from Fresno Flats to McBride's pass, on the State line. The estimated length is 150 miles. Directors—W. W. Walker, A. H. Washburn, Lyman Bridges, P. W. Johuson, Samuel Miller, R. P. Layton, E. W. Chapman, W. L. French and J. W. Kinkead. Capital, $7,500,000. It is reported that the road is to he the Pacific branch of Jay Gould's transcontinental railway scheme; that it will he a branch of the Union Pacific road, intersecting the South Utah, Atlantic and Pacific and Texas-Pacific roads at Pahranagat valley, Nevada, toward which all the latter roads are converging. A week ago a New York telegram to the press of this city, stated it was reported that Gould would build a road from Salt Lake to San Francisco.

CENTRAL PACIFIC R. R., SAN JOAQUIN DIVISION.—July 25. Capital, $6,000,000. Directors—W. W. Walker, A. H. Washburn, Lyman Bridges, P. W. Johnson, Samuel Miller, R. P. Layton, E. W. Chapman, W. L. French and J. W. Kinkead. The road ia to run from the southern terminus of the San Francisco and Ocean Shore railroad at Santa Cruz, to a point near Mintern, in Fresno county, connecting with the Yosemite Division of the Central railway. The estimated length of the road is 120 miles.

YUMA, PORT ISABEL AND GUAYMAS R. R. Co.—July 13. Location: From Yuma to Port Isabel on the Gulf of California. Directors—Chas. Crocker, George Crocker, T. Hopkins, C. P. Huntington and Leland Stanford.

THE Wood River *Times* says: Develop your claims. Don't wait for capitalists to huy you out. If you only have a six-inch seam of ore in sight the chances are, that, hy hard work and economical living, you can manage to "keep your head ahove water" until you have a paying mine. If you sell to capitalists now, you can't get half the value of your claim, and you must romain poor.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

OREGON.—Monitor *Argus*, July 25: The mining claim known as the "Oregon," and formerly as the Morning Star claim, situated on the Morning Star hill, in this county, has been sold to a London company for the sum of $7,000. Mr. Lewis Chalmers, of Alpine county, is the party who has brought about this trade. This is thought to he one of the most valuable properties in the county, and our only wonder is that it should change hands at so low a figure; and we verily believe that before another year rolls around, this property will be worth $1,000,000. There seems to be much rejoicing by the community in general by reason of this valuable property falling into the hands of a company who will at once proceed to more thoroughly develop it.

ORE.—H. C. Ginn was in town yesterday, and made arrangements to repair the wagon road between Monitor, Moqui and the Morning Star mine, he having contracted to haul the ore from the mine to Silver mountain for reduction. The work will commence to-morrow under Mr. Ginn's personal supervision.

TRIUMPH.—The owners of the Triumph mine, near Bagley valley are sinking 2 shafts on their claim to find the extent of the ledge. During the past week 1 shaft was sunk 16 ft; the other, 12 ft—in quartz rock. A number of assays were made yesterday from the bottom of each shaft, and from the countenances of the prospectors, we should judge the ore to he of very good grade. They have all returned to the mine to-day to give it a further test.

AMADOR.

THE STEWART MINE.—*Dispatch*, August 2: The 5-stamp mill on the Stewart mine, owned hy Mr. Robert Stewart, of Volcano, situated on the Mokelumne river just below the West Point bridge, is now in operation crushing the quartz from that mine. No clean-up has yet been made, but it is thought that the rock will yield from $60 to $100 per ton. There are 3 well-defined ledges at the points now worked, which are reached by means of tunnels run into the mountain; but from the angles of their dips, it is evident they will all come together when followed down to the proper depth, when it is believed the mine will prove second to none in the county in extent and riches. The veins are now respectively about 1½ ft, 3 ft and 4 ft wide, and the mill is conveniently situated near the mouth of the main tunnel, and has an immense water power with which to operate, being located several hundred feet below the Amador canal. This mine is destined at a very early day to take its rank with the first mines in this section of the State.

PACIFIC.—Amador *Ledger*: The shaft of this mine is down over 800 ft. The intention is to siuk to the depth of 1,026 ft before commencing to drift. As this shaft is perpendicular, this depth is equal to about 1,400 of the Empire, which is an incline shaft.

MISCELLANEOUS.—Work was commenced on Doyle's claim, in Hunt's gulch, on Monday. James Morgan has two men working on the Amador Queen claim, near the tunnelitg operations at Murphy's ridge. The Oneida will sink a new shaft, so it is rumored.

BUTTE.

BIG GOLD BRICKS.—*Mercury*, July 30: Saturday afternoon Supt. Waldeyer, of the Spring Valley mine, brought down from Cherokee 400 lbs. of gold. It was divided into six bars, and was worth $112,000.

CALAVERAS.

ACTIVE.—Calaveras *Chronicle*, July 30: During the week we visited most of the mines in Chile gulch and Tunnel ridge, and, with the exception of some of the hydraulic claims, which are closing for the season on account of the insufficiency of water, we found them all actively prosecuting work. The Sullivan tunnel, at the head of Chile gulch, was worked many years ago and abandoned. Wm. Sullivan, the present owner, has found ground which he has every reason to believe will pay good wages. Farther down the gulch we reached the tunnel claim, La Belle France. This is another very old claim, formerly known as the "Bob Paul claim." It has yielded immensely, and continues to make hig returns. Work goes on uninterruptedly. Below this claim is the Gleeson mine. Work is being pushed with vigor in this mine. There are first-rate hoisting works on the mine, run hy water power, and everything is working smoothly. Gravel has been reached, but the tuunel is continued on in order to strike the main body of the channel. The owuers feel confident of finding good ground. South of this mine is the Duryea hydraulic claim. Here, too, all is activity—16 men being employed. The claim is in fine running condition, everything being provided with which to facilitate operations. A large amount of gravel has been washed down, and the powerful derrick, run by water power, has proved an invaluable auxiliary. An enormous mass of huge lava chunks and bowlders have been lifted out of the way, which would otherwise have to he broken up, thus saving a great deal of time and labor. Farther on, but on the opposite side of the gulch, is the Brown & McSorley claim, the tuunel penetrating into the noted Tunnel ridge. This is one of the best tunnel claims in this section. It has been worked steadily for a long time by the present owners, and their labors have been well rewarded. There is an immense body of gravel, and uniformly rich, making it a lasting and remunerative property. We learned in the course of our round among the claims in this neighborhood that Mr. Geo. Green, one of the most experienced miners of this section, in company with other parties, is about to re-open and work what is known as the "Bratchett claim." We understand that an incline tunnel will be run to tap the lead. The next claim to take the McCann tunnel, now owned by McCann & Rigney, is penetrates into Tunnel ridge a distance of several hundred ft. Very rich dirt has been struck lately. There is a large pile of gravel on the dump, which prospects handsomely. Adjoining this claim and above it, is the Penobscot hydraulic, run by the experienced hydraulicist, Mr. Geo. Emerson. The season's run is completed, and the work of cleaning up is going on. This claim, too, is provided with all the requirements for working expeditiously, and, running 500 inches of water during the past season, some heavy work has been done. Leaviug the Penobscot and continuing our way, we next arrived at the Mammoth hydraulic, owned by J. F. Veith, Esq. Here hands were at work cleaning up after quite a run. The ground is good, and there is any quantity of it, and the indications are that this last run will be a very remunerative one. It is bound to he away up in the thousands. We next visited the adjoining hydraulic claim, the Bonanza, owned by S. S. Moaer & Co. Since our last visit to this claim, work in the upper portion has been suspended, and operations commenced in the lowor part, in order to work the whole to greater advautage. There is no "let up" in this claim. Work goes on the year round, and the owners never fail to receive liberal compensation. The gravel is rich, and the mine will last a generation.

EL DORADO.

GREENWOOD DISTRICT.—Georgetown *Gazette*, July 30: Perhaps among the most valuable mines in this county, and we might say in the State, are the New Dunker Hill and the New El Dorado copper mines, owned by Messrs. Stanley, Watson, Shepherd and Ricci. These mines are located in the Greenwood mining district, about half way between this place and Auburn. A few days since we were shown some beautiful specimens of ore taken from the New El Dorado mine. The assay of the ore taken from the same place as the specimen showed was, showed that the rock contained 64% of copper, with a good prospect of gold and silver. There are thousands of tons of the ore in sight, and seemingly the supply is inexhaustible. There is an immense ledge dipping to the east at an inclination of about 65°. Occasionally pieces of pure "na-

tive copper" are found as large as a walnut, and from that to the size of a man's fist. If a few more such mines as these be developed on this divide, it will place our part of the county among the foremost mineral districts in the State. We understand that parties from the East are negotiating for these mines, and from present prospects the people in the vicinity of Penobscot will soon have their ears regaled with the ever welcome sound of the steam whistle.

EUREKA.—The main ledge of the Eureka was tapped on Tuesday from the lower or 230 level, a distance of 33 ft from the shaft. The ore prospects well, estimates being made all the way from $20 to $50 per ton in free gold, by simple mortar tests made the day following. So far the rock certainly improves in depth. Next week we will be able to give something more definite.

MINING SUCCESS.—*Mountain Democrat*, July 30: Milo Oldfield and George Johnson are doing remarkably well in a gravel claim at Spanish hill, belonging to the Blair Bros., which Messrs. Oldfield and Johnson are working on shares.

MARIPOSA.

RICH ORE.—Mariposa *Gazette*: We learn that very rich ore has been taken from the Santa Domingo quartz mine, near Hornitos. Zamora and Armenta are the proprietors.

RICH PLACER MINE.—We are informed that Dr. Kellet, of Hornitos, is engaged on Burns creek in opening up an old placer claim of great depth. He has fine prospects of a big raise.

HORNITOS.—There have of late been some important changes in the mining operations of this section. The Yosemite mine is being worked now, and the mill will start up just as soon as pipe can be laid from El Dorado creek to convey a sufficiency of water to the mill. This necessitates the laying of about 8,000 ft, about 2,000 of which has been laid within the past two days. Pipe-laying will in all probability be finished this week. The mill has undergone an entire change. Since Mr. Mitchell has had charge of the mine it has been worked with better success. Mr. Huling has paid all back due to the old company, and is running the mine on his own responsibility. At present there is some fine ore coming out of the mine. Mr. R. Barcroft has bought out most of the owners in the enterprise mine, and now has 8 men at work upon the mine. I learn that the Quartz Mountain mine has been sold to a New York company. It is the intention of the buyers to build a large mill on the Merced river.

MONO.

BULLION.—*Free Press*, July 30: The first clean-up of the Bechtel was completed at the Noonday mill in the early part of the present week, and the shipment made. It amounted to $33,052.03. The run was of about 3 weeks. This must be considered as exceedingly gratifying, and would seem to fully justify the Bechtel management in the erection of a mill—a project which has been under contemplation for some time. At the same time it will be an encouraging circumstance to state that the bullion shipments from the district from the 1st of January to the 30th of June, the first 6 months of 1881, were $1,600,000. The shipments for the same period in 1880 were $1,400,000, and in 1879 they were $1,100,000. The average of shipments for the first 0 months of this year has been over $266,000 per month. The shipments of this year would amount, in the ratio of those for ths first 0 months, to $3,200,000, which would be about $200,000 more than last year, but we have no hesitancy in expressing the opinion that they will amount to $3,500,000. It will be seen that, notwithstanding the thinning out of population and ths low price of stocks, Bodie is now producing a bettsr average of hullion than ever before.

NEVADA.

VERY ENCOURAGING.—Nevada *Herald:* For two years or more the Cold Spring M. Co. have been pushing ahead their tunnel through hard rock, running in that length of time about 500 ft. Recently the men at work in the mine broke through ths rim rock of the hard ledge of granite and encountered soft rock. This is an encouraging sign and causes the stockholders to feel elated ovsr the prospects of being able to push rapidly forward and reach the gravel channel. During the past two years the average progress per week was about 4 ft. It is believed that as much can be done per day now. Between 500 and 600 ft. have yst to be run before the channsl is reached.

ANOTHER RICH DISCOVERY.—*Transcript*, July 29: A. H. Scott, who has been prospecting for a year or so past in the region of country between Banner Hill and Greenhorn without finding anything worthy of location, has at last been rewarded for his assiduity and perseverance. About a month ago he discovered the croppings of a ledge on the main road south of Banner Hill, below Stiles' goat ranch, and hut a short distance from the school-house. As usual, he commenced sinking a holo and prospecting the ledge. The rock was considerably decomposed, but discovering indications of free gold in it, he concluded to take out a crushing. The deeper he went, the larger and richer became the rock. He has now about 20 tons on the dump pile, which will he crushed by mill process. The ledge is now 4 ft between the walls. Three days ago he took a panful of the decomposed quartz and ores, and on washing it out, got 50 cents to the pan. Gold was plainly visible in the pieces of quartz remaining in the pan, and he is convinced thet fully as much more could be obtained from it. He is now engaged in sacking up the quertz as he takes it out for shipment. The rock upon the dump will not go less than $25 per ton, and it may double that amount, although there is considerable waste dirt in it.

STRIKE IN MT. AUBURN MINE.—Mr. C. K. Kirby, the indefatigable Superintendent of the Mt. Auburn quertz mine, has at last cause to feel happy—that is, if the discovery of a fine chute of ore will make him so. On Friday last, the miners working on the 300 level struck into a fine looking vein of ore, averaging 18 inches in thickness, filled with rich sulphurets and galena. Taking the course of the ledge, Mr. Kirby caused exploration to be made on the 400 level, and here again he was gladdened by the sight of the same fissure, only richer, with the ledge nearly 2 ft thick, going in the direction of the 000 level. Workman are now engaged in drifting on this level, and the indications are thet they are not far from the pey chute. The erection of a mill, which has been on the tapis for some time, is now a foregone conclusion, and it will not be long before a fine one, with all the modern improvements, will be in active operation. The Mt. Auburn is destined to prove a mine of wealth to the persevering owners.

PLACER.

THE MOUNTAIN OATE.—Placer *Times*, July 30: From Charley Uren, who accompanied his father, E. C. Uren, on a surveying trip over to Damascus, we learn that a big strike has been made in the Mountain Gate drift gravel mine. This mine is an old one, having been worked for years, but recently the pay channel gave out. After running along with the tunnel several hundred ft gravel was struck. A shaft was sunk 80 ft deep, when the best paying gravel ever found in the mine was opencd up. The first run after striking the new lead cleaned up $10,000. Last week's run panned out over $2,000. This mine has been bonded for $105,000, but we should judge the 21 shareholders now wish that bond was in the bottom of the sea. From the same source we learn that the Sunny South claim has again been started up with good prospects of a very flattering nature. This claim has been shut down for a few months past.

GOOD QUARTZ PROSPECT.—The quartz ledge recently located by Jas. McIntosh and L. R. Colgrove, in Bear valley, near Towle Bros' saw-mill, makes a better showing each day as it is being prospected. Last week some specimens of ore were brought down and assays made of them which, in each instance, showed plenty of gold. It is estimated the ore will go all the way from $50 to $200 per ton. The ledge, so far as opened, shows a lode of 0 ft in thickness, and has enlarged the further exposed. The owners have sent men up to open up the mine more thoroughly.

THE Baker mine will probably be shut down for the season this week, the water supply having about given out. Only enough water to run 0 out of 24 hours is now in the ditches. This has been one of the best season's work ever made in the Baker. The Liberty Hill hydraulic mine is being worked with much success this season. The season is about over, however, for this year.

THE WESKE MINE.—Placer *Herald*, July 30: We spoke last week of the visit to the Weske mine, near Michigan Bluff. This mine is now owned and run by the Messrs. Muir, and from all accounts is paying well. The old steam works underground for pumping the water and raising the dirt up the incline have been supplanted by water power, which does the work equally well, and which is run at very little expense compared to the cost of running the steam engines. Very much virgin ground remains to be worked, and some of it is certainly very rich. We were shown one breast in this mine where the gravel was so full that the gold was plainly visible to the naked eye, and pieces of the pure gold were mixed among the sand and rocks so thick that the merest novice could soon pick out an assortment of specimens. In some of the small crevices on the bedrock there seemed to be as much gold as gravel.

PLUMAS.

SOUTHERN EUREKA.—Greenville *Bulletin:* Pres. J. B. Scott returned from New York yesterday morning, having been absent six weeks.

THE MINES OF GRANITE BASIN.—The mines of this place are becoming somswhat noted, and capital is seeking investment here. Yesterday several parties arrived from San Francisco who are negotiating for the White and several other ledges, and no doubt a sale will be made in a short time. Mr. Minto is expected to-morrow, and will commence the construction of a 20-stamp mill immediately; the machinery is on the way from San Francisco. Thos. Shannon and others are expected here in a few days to examine, with a view of purchasing, a mine on Grizzly creek. W. Smith Dean had 1½ tons of the gravel from his mine crushed in Emmet's mill, which paid $3 per ton. For so small an amount this is considered big pay, from the fact that from two to three times the quantity can be run through a battery per day than can be run of quartz.

SAN DIEGO.

PINACATE DISTRICT.—Colton *Semi-Tropic:* The Pinecate mining district continues to hold its own. Nsw discoveries are continually being made, and considsrable work being done on the main leads. The San Jacinto mining company are still actively at work, and are developing a fine lot of ore. The walls have spread, and they now have 3 strata of pay ors, making altogether 4 ft of solid pay rock. Indications promise rich developments soon. The mine is now down 100 ft, and drifting is being carried on with vigor. At the depth of 100 ft the rock assays a little over $50 per ton. Thsre is about 300 tons of ore on the dump at this mine, and from careful assays it will run from $50 to $80 per ton. At the Good Hope mine, Messrs. White & Berber are putting in position steam-hoisting works, and carrying on the work of the mine all the time. This mine continues to turn out a fine grade of ore. There will soon be a mill put up for crushing the ore of this mine. Besides the two leading mines, encouraging reports are received from all parts of the district. It is reported that the Mexicans have just made some very rich discoveries in the northern portion of the district, and that the prospectors are actively seeking for pay rock in that section.

SHASTA.

COPPER CITY ITEMS.—*People's Cause*, July 28: From James McGarry, of Copper city, who arrived here yesterday, we learn that the prospects for a bright future for the above named place are very flattering. The Extra Co.'s mill, Potter & Hall, proprietors, is running night and day, turning out bullion to the valus of bstween $750 and $1,000 per day. This le only a 10-stamp mill, and if the company should put in about 20 more stamps, which our informant thinks will probably be done in a short time in the near future, bullion to the velns of about $5,000 will be shipped from Copper city daily. Mr. McGarry informs us that he, together with five others, have taken up an extension to the Northern Light mine, and they have drifted already 180 ft; they have about 75 or 80 ft mors to drift through the solid rock before they can reach the main ledge, and when that is done, they expect to be benefited thereby.

SIERRA.

WOLF CREEK.—*Mountain Messenger*, July 30: Work has been in progress on the Wolf Creek ledge for some time, only a small force working. Some very rich rock is being taken out.

COX & GOURLEY took $50,000 to San Francisco recently ae the result of their season's run.

DOING WELL.—Kendall, Noble, Freese and Boyington are doing well on the North Fork. They had a $150 dividend last week.

THE last two carloads of gravel washed at the B. M. Ex. Co. yielded $83.

MORTAR.—At the Downieville foundry of Taylor & Forbs a flue mortar for the Buttes mine was cast a few days since, weighing 5,300 lbs. It came out in splendid shape, almost as smooth as though planed, and with not a flaw in it.

GOLD BLUFF.—Mr. Vanslyke, principel owner of the Gold Bluff mine, showed us some specimens of his rock this week, in which fine gold in liberal quantities was visible to the naked eye. The ledge upon which he is working is 100 ft wide, and is an entirely new discovery, no rock like it having ever been found in the mine before. Considerable water is encountered, which indicates (to use an expression of which we do not know the exact meaning), thet the "mother lode" has been found. Van deserves the success he is meeting with.

TRINITY.

DEADWOOD RICHNESS.—Trinity *Journal*, July 30: From Deadwood district we hear of several rich discoveries which have recently been made. The McDonald boys struck a quertz vein on the Gibson location, some of which is said to go as high as $15 to the pound. Wm. Lappeu has quartz that goes $1,000 to the ton. Grayson & Co. will have their 10-stamp steam mill in operation by the end of next week

PAIR WELL.—Mr. M. Heimbucher, Supt. of the Altoona Co., in Cinnebar district, informs us that during the past season he prodnced and shipped quicksilver to the value of $5,200, the total expense of such production being only $1,200, and leaving a net profit to the company of $4,000. The Cinnabar was obtained from surface sluicing, 2 stringers being cut during the season.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—Gold Hill *News*, Aug. 1: The joint Union Con. east crosscut on the 2500 level is being repaired and enlarged. At the Sierra Nevada Mexican-Union shaft have placed 2700 station pump in position, and connected the rod; also, casing timbers at the 2300, 2400 and 2500 levels. During the week 320 tons and 600 lbs. of ore have been extracted and sent to the mills.

UNION CON.—On the 2500 level the joint Sierra Nevada east crosscut is being enlarged and repaired. On the 2700 level joint Sierra Nevada east drill hole No. 1, from the station, has been extended 110 ft.

CALIFORNIA.—During the past week 48 tons and 1200 lbs. of ore have been extracted from the 2000 level. On the 2500 level are cutting out a station for the joint Con. Virginia winze.

CALEDONIA.—Pumps have been run on an average of 11 hours per day, consuming an average of 4 and 6-7ths cords of wood per day. Forman shaft has been sunk and timbered 10 ft; total depth, 2,005 ft. The water has increased a little during the week.

CON. VIRGINIA.—The joint Best & Belcher crosscut on the 2300 level has been advanced 19 ft. On the 2500 level are cutting out a station for a joint California winze.

OVERMAN.—The drift on the 2275 level has been extended 53 ft, 30 ft of which required timbering. Forman shaft has been sunk and timbered 15 ft; total depth, 2005 ft. There has been a slight increass of water during the week.

UTAH.—The tank pit for the new pump at the 2350 level is completed, and sinking the incline will be resumed today. The north drift on the 400 level is in 420 ft. Crosscuts will now be run at different points both east and west.

MEXICAN.—Are timbering up the main north lateral drift on the 2700 level.

OPHIR.—In the joint Mexican east winze are cutting out a station on the 2900 level. The joint California east winze on the 2500 level has been sunk and timbered 13 ft. Are repairing ths Burleigh and incline air compressors.

C. N. S. SHAFT.—The east section of the hydraulic pumps is running satisfactorily. The material to repair the west section has not been received from San Francisco

UNION SHAFT.—Have placed pump in position at the 2700 station and connected the rod; also are casing timbers at the 2300, 2400 and 2500 levels.

CON. IMPERIAL.—Doing the usual work on the 200 level and repairing and retimbering drifts on the 2800.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, July 30: The shaft levels show about the same as last week, and are yielding as usual. The only material change is in the intermediate between the 1st and 2d levels, which has shown an improvement since last report. The levels above the adit are looking well throughout—the 0th and 10th especially presenting a fine appearance. About 85 tons of ore are being extracted and sent to the mills daily. Both mills are running steadily and doing good work. Bullion shipments for the week ending July 27th, amounted to $21,-$91.86; shipments on July account to 27th instant, aggregate $77,008.09.

MOUNT OLABLO.—The north crosscut, from the bottom of ths winze from the 3d level, has been driven 12 ft since last report, and shows a favorable formation in the face. The west drift has advanced 15 ft, and is in promising ground, giving low assays. There is northing worthy of note on the 2d levsl. In a winze bstwsen the 2d and 3d levels there is a good vein of high-grade ore. The stope on the 1st level shows a good body of ore. In the old Mount Diablo tunnel, sdit lsvel, a stope on a small vein is giving some good ore. Shipments of bullion during the week were $6,576.34 on the 22d instant, and $8,110.60 on the 20th.

HOLMES.—The work of preparation on this mine is being vigorously pushed. A line of air-pipe has been put in, which gives a good circulation, and removes the powder smoke much more rapidly. Track laying has been commenced. In a dey or two a car will be put on, and matters about the tunnel will have an assuring appearance.

ACTIVITY.—Esmeralda *Herald*, July 30: Ex-Senator Garrard returned from Sweetwatsr district Wednesday. He informs us that the Great Western claim is developing well, and bids fair to become a fine property. The Comstock and other claims are being worked, and some of them are showing very well for prospects There is considsrable activity in the district, about 30 miners being at work.

EUREKA DISTRICT.

WILL NOT BE CLOSED DOWN.—*Sentinel*, July 30: President Robinson informs the *Sentinel* that ths Albion will go right ahead as usual with the work of development. A force of men will be kspt on dsad work until the meeting of the Supreme Court, after which a large number of miners will be engaged in extracting the rich ore of this great bonanza. It is thought that the Albion will require not less than 300 men in the mine by the 15th of October. The legal obstacles remaining to be overcome have been reduced to a very thin proposition.

SILVER CANYON DISTRICT.

STARTED UP.—Whits Pine *News*, July 30: The mill at Silver canyon was started up last Monday. We are informed that a long run is contemplated. The mines over there are looking first-class, and we shall expect to be able to chronicle regular hullion shipments from there from this on.

ARIZONA.

THE COPPER QUEEN.—*Arizona Mining Journal*, July 30: Tbis well-known and valuable mine has a second furnace now turning out hullion. The new furnace will double the amount of bullion heretofore shipped. During the coming month there will be turned out from that property between 700,000 and 800,000 lbs of copper hullion. The starting up of the new furnace has necessitated the employment of additional men, which has created considerable new life in Bisbee. Everything in and around the camp is looking well.

SAN PEDRO DISTRICT.—The Pioneer mine, owned by Solomon Werner, of Tucson, and others, has a sheft down 00 ft. Fifteen tons of ore was hauled to Tucson, and worked at Warner's quartz mill, returning something over $200 to the ton. This is undoubtedly a valuable property.

SILVER QUEEN MINE.—Main shaft is down 95 ft. There is a good, strong vein of rich ore, and this is, beyond douht, one of the most promising prospects in this section. The owners are now making a ditch to carry water from the Gila river to their mill-site. There is a dump of at least 100 tone of ore at the mine, which is the richest in the district.

THE WALSTON.—Main sheft is down 140 ft. A drift has been run on this level 12 ft on ore. At the 50 level of shaft have crosscut vein 20 ft to foot-wall. This crosscut is all in ore.

SAMPLE MINE.—Owned by Pete Young, Fred Getz and others. Shaft No. 1 is down 100 ft. Shaft No. 2 is now being sunk, out of which very rich ore is being taken.

THREE mines are all situated convenient to wood and water, with a productive farming country within a few miles, where grain, vegetable and other products of the soil are raised in great abundance, giving this district advantages seldom met with in our Territory.

SILVER BELL DISTRICT.—We learn from Mr. A. T. Lea, who has just returned from Silver Bell district, where he has had charge of work for a Pennsylvania company, who own and are developing the Doxology, True Blue and Spring mines, the following particulars relative to work now being done on the above-mentioned mines, as well as some facts about other claims in the same district: On the Doxology, the work consists mostly of openings along the ledge. Eight cuts have been made, each opening showing ore. This work has been done for the purpose of determining where to sink the main working shaft. The ledge has been exposed in the openings, and 800 tons of good ore taken, and is now on the dump. On the west lies the True Blue, following the ledge. There are 200 tons of ore on this dump—yellow and gray carbonate, mixed with chloride. Assays range from $15 to $122. On the Spring mine considerable work has been done, showing a flattering prospect. Twelve men are employed, night and day shifts being run. These mines are situated 40 miles west of Tucson and about 4 miles east of Pelton, lying along the north line of the Young America copper group, purchased some time since by Eastern capitalists from Charley Brown and associates. Considerable work has been done on these mines. Next to these lie the Reardon group of copper mines, bonded to Senator Norwood and associates. Senator Norwood has also an interest in the Bullwhacker. Work is about to be commenced on this latter mine, which is said to make a fine showing as a copper prospect. These mines are on the same mineral belt with the Huachuca smelting company's property, at Pelton. The smelter of this company is now turning out copper bullion every day.

COLORADO.

DIAMOND TUNNEL.—Colorado *Miner*, July 29: The tunnel is now completed 1,650 ft. The working force has been increased to complete the tunnel to the intersection of the Cory City lode and open up its expected bonanzas as soon as possible. In No. 3 and 5 lodes, drifts west are being extended to open further ore bodies. No. 6 lode, east of the tunnel shows 3 to 10 inches of rich ore running from 70 to 400 ounces of silver per ton, and No. 6 lode, west of the tunnel, shows a 12-inch pay vein of low-grade ore which, with stoping, will probably prove as rich as the east ground. No. 8 lode shows a 2-ft pay vein of low-grade ore, but improving in the stope.

DECATUR.—The main points of attraction at the present time for the miners and prospectors of Decatur are the Horseshoe and the head of Chihuahua gulch, where some excellent discoveries have been made and a decided attempt to develop the properties is manifest. It is a disagreeable fact that two of the most prominent and oldest mines of the locality, the Peruvian and Tariff, are dormant.

In company with Gus Williams, one of the solid men of the camp, we made the tour of the Horseshoe on Tuesday morning and saw several highly promising mines. The majority of the properties, however, are mainly prospects, though some of them are remarkably good ones.

IDAHO.

BAY HORSE.—Yankee *Herald*, July 21: The mines of Bay Horse are improving in width and richness under active development, and the output of ore is steadily on the increase, while the general business outlook is much more promising than during the past two seasons. Like most mining camps, every branch of business is overdone, and though it causes considerable grumbling, nothing more could reasonably be expected. As the foremost ore producers of this section, the now famous Ram's Horn mine is making an enviable record. There are 63 men employed in the mine at the present time, and ths force will be steadily increased. Sixty mules make one trip daily from the mine to the smelter, taking from 8½ to 10 tons per day.

MONTANA.

ERECTION OF A SMELTER.—*Inter-Mountain*, July 30: C. T. Meader, president of the Bell Co., arrived yesterday morning from Salt Lake, where he has been for about 2 weeks on business connected with the mine. Mr. Meader's trip was very successful in a financial point of view, and he has already begun to make arrangements for the immediate erection of the smelter for the reduction of Bell ore. This is good news for the stockholders, as it furnishes all needed assurance as to the future success of the company's operations.

LEXINGTON.—Helena *Independent*, July 30: The Lexington mine, of Scratch Gravel district, within about 5 miles of Helena, is to start up in a few weeks under the superintendsnce of H. W. Child. Sufficient capital has been furnished to warrant an amount of development that will probably establish the direction of the lode and its value.

A. M. Wilkinson & Bro. have discovered a lode of excellent promise bstween Wickes & Vaughn's Little Jennie mine, about 2 miles off the road recently built to connect this mine with the Alta Montana Co.'s reduction works. The two locations made are called the Wickyup and Assiniboine. Only a limited amount of work has been done, but the vein seems to be very wide, and samples are found that carry 250 to 2,000 ounces of silver to the ton, besides some gold.

ONE of the branches of McLellen creek is called Crystal creek, and in its vicinity there seems to be a good deal of activity among prospectors. Hill & Co. have named a lode the Shoofly, and from its output run a test at the Guyer mill with a saving of $20 of gold per ton. They have a shaft 20 ft deep, and about 20 inches of the vein carries this kind of pay. About 600 ft north of the Shoofly, and not far from the Uncle Sam, owned by Kimber & Buswell, and from which a test lot was milled with a saving of $15 per ton, a new discovery has been made that shows well for the 2 ft of its width. The Star of Hope is the widest of the lodes discovered in that locality, but many of ths narrow lodes are rich, and it is not unlikely that wide ones will be found carrying the same grade of good pey. The Alice mine, of Cascade gulch, 1½ miles from the Star of Hope, is 2½ ft deep and carries a narrow pey streak of very rich ore. Twelve inches of it will average at least $30 gold per tou, and one mill test nettsd a saving of $35 er ton.

OREGON.

ITEMS.—*Democratic Times*, July 8: S. C. Carter has sold his claim on Squaw creek to a Chinese company. Gold has been found on A. P. Talient's farm on Wagner creek, and it is believed to exist in paying quantities. A neat slug of gold, worth $1,000, was found at Scott's Bar, Cal., recently, in the Mountain View M. Co.'s diggings. Jas. Ralls showed us some quartz taken from the old Winchester ledge in the Willow Springs district, which looks well. A Mr. McKee, of Galleo creek, a pioneer miner, struck some rich diggings last season, taking out several hundred dollars. Jack Leyton is still engaged in piping, but expects to commence cleaning up before long, as water is failing. Wimer & Simmons, of Weldo, are still cleaning up and taking out large quantities of gold dust. They will do even better than they did last year, when they cleaned up over $10,000.

UTAH.

STAR DISTRICT.—Cor. Salt Lake *Tribune*, July 22: The biggest mines in Star, at present writing, are not producers of the highest grade ores, yet in the early days of this now permanent camp, ores of a very high grade were extracted and shipped in considerable quantities to Salt Lake, and for reduction at Shauntie. Some of these ores come from are still being worked and are looking well at a greater depth. I now refer to the Talisman, Ivanhoe, Turk, Little Mint, Hickory, Osceola, Star, Horn Silver (of Star district), Independence, Crœsus and a number of others. A year before the railroad reached this district, Star had a bad set-back on account of the great drop in lead; many of the miners, in fact two-thirds of them, left for other fields and camps. But to-day 3 extensive enterprises have begun. A big working tunnel is being run on the Mammoth mine. A new vertical shaft on the well-known Rebel mine is now down nearly 200 ft. And the Boston mine is being very extensively worked by W. S. Searls. A new patent whim is to be placed upon the Talisman soon. Ores are being steadily shipped to Frisco for reduction. The extension of the Utah Central railway to the south and to the great iron deposits, which are only 40 miles south of Star and Frisco, will furnish cheap flux and manganese for the better reduction of ore. Star district is 15 miles in length and about 10 miles in width, and now shows over 50,000 ft of shafts, tunnels and drifts, not counting prospect holes of 6 or 10 ft in depth. Star district has the longest incline shaft in southern Utah, that in the Wasco mine being 900 ft in length, with ore in the bottom and looking better than ever. And all this work of 50,000 ft has been paid for by the ores extracted therefrom. About 50 men are now working in this district, and now strikes and improvements are reported most every day.

CHRISTY.—Silver Reef *Miner*, July 24: The Christy Co.'s mines continue to yield excellent ore, and everything at mines and mill is running uninterruptedly.

THE CALIFORNIA.—All the stopes and levels look remarkably well. Sinking on the main incline continues, and shows increasing strength with additional depth. Improved hoisting works are in course of erection, and a new 54-inch boiler is expected in a few days, which will be put in position at once. This will greatly facilitate the handling of the mine's product, as well as meet the requirements in sinking the main incline.

THE STORMONT.—Reports from this company's mines are very encouraging, and the manager is quite content with the outlook, which surpasses his previous expectations. As the work of development goes on the promise of permanent and profitable mine increase is apparent on all sidee.

THE BARBER & WALKER.—Work in this mine is progressing steadily, and with very encouraging results. The ore continues to improve in extent and richness as developments progress, and everything looks favorable for the uncovering of larger ore bodies than have heretofore been encountered in the mine. The old workings have undergone a thorough retimbering at different places, and several good ore faces are now exposed therein. The property is being worked in a systematic manner, and is supplying the mill to its full capacity. A winze is being driven to connect the 3d and 4th levels north, and is going through some good ore. This will no doubt show up a valuable block of ground between these levels. The mill is in good condition, and can be relied on for regular shipments in the future. The company have resumed bullon shipments, and shipped one bar yesterday and one to-day, aggregating $3,500.

A YOUNG man named Hugh McSorley fell 90 ft. down a shaft of the Gleeson mine, Calaveras county, and, falling in the water of the sump, was not injured materially.

California Wheat-Shipping Points.

The address of the retiring President of the S. F. Produce exchange brings forward prominently the fact which all acquainted with the subject have noted, and that is the movement of wheat shipping away from San Francisco and toward other points here and there around the bay. We have been prone to consider this tendency a good one on the whole, not that we love San Francisco less, but the State more, and we like the building up of business points as near to the productive fields as possible. Thus when the ships can be laden in the Carquinez straits and taken thence to Liverpool for less than the same could be handled and sent forward from San Francisco, why should the wheat grower pay the cost of rolling his grain 40 miles or so farther? There is evidently no reason why he should, for he is ceasing to do it. Last year San Francisco lost a good part of the wheat because of storage and ship loading at Port Costa and vicinity, and this year the tendency toward loading in the upper bay will be still more apparent.

President Clayton, in his address, gave the figures of loadings, for the last three harvest years, as follows:

	1878-79.	1879-80.	1880-81.
San Francisco, ships	148	110	103
Oakland	62	37	33
Vallejo	65	18	97
Benicia	—	—	31
Martinez	—	—	1
Port Costa	—	—	84
Totals	275	285	349

In relation to the subject, President Clayton says it will be observed that with a great increase of tonnage the number of vessels loaded in San Francisco has actually decreased, until now we do not handle at our wharves even 30% of the grain shipped to Europe. This, too, in the face of the attempt made by the Harbor Commissioners to facilitate the handling of the grain here through the construction of the grain sheds on the sea wall. The freedom from wharf charges at Port Costa, Vallejo, Benecia and Martinez, is more than an offset for the extra charges for towing. If the transfer of so great an amount of business to other points is owing to natural advantages, the citizens of San Francisco have no cause for complaint; but if this is caused by the limited jurisdiction of the Harbor Commissioners, this limitation amounts to a direct discrimination against this city.

It is certain that San Francisco cannot complain justly. For a long time ships loading here have been submitted to expenses almost amounting to extortion, and it is little wonder that the victims will fly elsewhere just as soon as the opportunity offers. It is only fortunate that such an escape was possible. Now, there are other expenses which should be considerably lightened up, and there will not be so much reason to put up charters to the disadvantage of the grain growers as there is at present.

In connection with mention of the meeting of the Produce Exchange, the *Bulletin* recalls some general facts on the shipment of California wheat, which are valuable from a historic point of view, and should be preserved for reference. It is shown that it is now nearly 13 years since the first wheat ship was loaded with California wheat away from San Francisco. This was the *Daniel Marcy*, which took her cargo aboard at South Vallejo in September, 1868. There were four ships loaded during that cereal year at the same point. The completion of the railroad from Sacramento to Vallejo made the above movement possible at that time, and the operation of that and other roads has contributed to the same end ever since. It was not until August, 1870, that Oakland Point was made a place for the loading of wheat ships. These two points have been the only real rivals to San Francisco in the loading of wheat ships until last year, when Port Costa and Benicia were made available by the ferry introduced between these points by the Central Pacific Railroad Company to accommodate the overland trains. The annexed table gives the localities of wheat loading for the past 13 years:

Years.	San F.	Oakl'd.	S.Val.	Misc's.	Total
1868-69	171	—	4	—	175
1869-70	163	—	31	—	194
1870-71	71	16	36	—	123
1871-72	24	12	7	—	43
1872-73	189	106	44	—	339
1873-74	94	77	76	—	247
1874-75	116	82	63	4	265
1875-76	75	35	64	—	174
1876-77	114	85	103	5	307
1877-78	58	14	37	—	109
1878-79	142	62	65	—	269
1879-80	118	37	118	—	273
1880-81	103	33	97	124	357
Totals	1,438	559	745	133	2,875

The miscellaneous column above for 1880-81 includes the 84 ships at Port Costa, 31 at Benicia, and several at Wilmington, Los Angeles county.

WOOD PAPER.—The *Paper World* mentions a new article for covering walls, called wood paper. In this paper is given a thin veneer of the wood desired, and can be rolled up like ordinary paper. This paper, properly applied, gives the walls of a room all the appearance of being worked in hard wood.

SAYS an exchange: It would be a good thing for the mining press of the country to hear in mind that every puff of worthless property, and every endorsement of a rotten company is a stab at the legitimate mining industry of the country.

The New Mexican Turquoise Mine.

From a letter to the New Mexican *Mining News* we extract the following, telling as it does, evidently, the true story of that turquoise mine:

Carbonateville, or Turquesa, is located at the north end of a gulch running north and south, about five miles south of Bonanza and four miles north of Cerrillos. It has a population of nearly 200. The view from the southward is most magnificent. The Sandia mountains, 40 miles distant, are readily seen by the naked eye from this village. The village is well supplied with hotel accommodations.

Messrs. Frank Dimmick and Robert Hart were the first settlers of Carbonateville. They came here in 1879 and located quite a number of claims in February of that year. They also opened up the Carbonate mine in the same year. It is on the town site and is down 134 ft. It is not now worked.

This is a quiet, peaceful mining camp. Two good assayers are permanently located here and as they are reliable men, confidence can be placed in their statements.

A few words about the celebrated turquoise mines. As they have been written up so graphically within the last 25 years by some of the ablest writers of the age, I approach the subject with hesitation. I will try, however, to give a few additional facts as I find them. The work on these mines, as is well known, was discontinued in 1860, and was resumed again about a year ago. The patentee of the land, as near as can be ascertained here, is Mr. Enos Andrews, of Santa Fe. In the spring of 1880 a party of New York capitalists located a claim on this mine under the United States mining laws, and have expended a number of thousand dollars in sinking shafts, making tunnels, etc. Work is now stopped, and, as I was informed yesterday by one of the gentlemen who have made the improvements, no more work will be done in the near future, at least, as every dollar expended has been a loss to the company. A large quantity of this turquoise, the best quality taken out by this company, was taken by one of the proprietors to one of the best jewelers of New York city, for an appraisement of its value. This jeweler pronounced it of *no value whatever*. The turquoise stones were left there with the jewelers to sell, but not one cent has ever been received by the company from them. For ages to come fabulous stories of the immense wealth mined from this great natural storehouse of turquoise will be told and believed throughout the civilized world, and yet the facts are that the stone recently taken from this mine has no commercial value. I visited these mines, and the above statement, coming from the owners of the mine, can be relied upon.

Buy New Mines.

In one of our late exchanges the principle is laid down that it is safer and cheaper to invest in a new property than in a nearly exhausted mine, even though it be paying dividends. The principle is such a sound one, and has been so often verified that it scarcely would seem to need comment; and still there are people whose sole idea of a profitable investment is something that pays at once. If it had had any weight with Mackey and Flood and others on the Comstock and in different parts of Nevada and California, the bullion product of the last decade would have been a mere bagatelle beside what it has been. They reached a depth of 1,200 ft. in the Con. Virginia, and 1,300 ft. on the California, before dividends were in order, and then the fearful began to buy, and continued to buy until the last dividend was paid and assessments were called for. Take almost any dividend paying mine you chose, and multiply the number of shares by the value per share, and the price is fabulous. Take the Nevada mines that have paid the most dividends, and they are the heaviest tax upon their owners to-day. The men (this is our point) who were in them early, and staid with them, made the money, and the latest investors only got a legacy of assessments. The moral is obvious, buy good prospects at moderate prices, develop them intelligently and economically, and your chances of making money are far greater than if you bought into a played out dividend paying mine.—*Silver Belt.*

AN EXPERT'S EXPERIENCE.—A mining expert recently went down the shaft of a mine in the Tombstone district of Arizona, which has not been worked for several months. His trip was evidently anything but pleasant, for he had scarce struck the bottom before he shouted to the man at the windlass to hoist. When he reached the surface he said, in answer to the anxious inquiries: "Why, there—are about—17 rattlesnakes—52 horned toads—a thousand rats—and half a dozen of the d—dest Gila monsters you ever saw—I wouldn't give a cuss—for the mine—except as a side-show—or a menagerie—it's worth a hundred thousand dollars for that—a regular bonanza."

THE Nevada *Daily Transcript* says that the new mill of the Rising Sun quartz mine at Colfax is completed, and is doing good work. The new shaft is down 118 ft. and the superintendent says it has the same vein continuously followed from the main shaft; at the present depth the pay vein having widened out two ft.

Curious Ore.

The *Tribune* reporter the other day dropped into the Utah sampling mill, where he was shown by the proprietor a lot of 10,000 lbs. of ore, recently brought in by Hon. R. B. Vivian, of Bozsman, Montana. The ore is from near Bannock, and will run well, probably over $800 to the ton. It is curious looking stuff, and Mr. Conklin confessed that he didn't know what to make of it, but it was probably very good. One heavy specimen was brought in boxed, and had just been opened. It weighed 123 lbs.

"Speaking of curious ore," said Mr. Conklin, "this is the worst deception I ever saw;" and he pulled a couple of small specimens from his pocket, which seemed to contain nothing but iron pyrites.

He then went on to say that nine men out of ten would pronounce that ore worthless. It came from a mine in the vicinity of the Grand Prize, and where a box of it, weighing 180 lbs., was brought to the mill. He was inclined to laugh at it, and intimated that it would not pay the expenses of sampling. The party, however, was willing to run the risk, and as Mr. Conklin said, a man may have brick-bats sampled if it is his notion, and he wants to pay for it. So he took that particular job himself, and to his astonishment it run $5,000 to the ton. He has since assayed several lots from the same vicinity, and it will average from $2,500 to $3,000. The specimens have been shown to several experts, every one of whom have pronounced them worthless, and could hardly be made to believe otherwise.

A Montana Smelter.

The Parrot smelter, built last winter, could not be possibly started up until this week, owing to the protracted delay in the arrival of the machinery and fire brick. Everything is in readiness, now, however, and under the skillful management of Mr. Migeon, a long and successful run is anticipated. The furnaces have a capacity for reducing between 12 and 15 tons of ore daily, the metal product of which will be three or four tons, according to the percentage of copper contained in the ore. The first matte will be run out on Saturday.

A very large amount of copper ore is already extracted from the mine and is available for immediate reduction. The main shaft has attained a depth of 80 ft., but there being an abundance of ore on the dump and in the upper workings of the mine, a cross-cut to the vein will not be extended until a depth of 180 ft. shall be reached. The new shaft-house, 50x20, with workshop additions is now completed, and according to a letter received this morning from B. F. White, the hoisting machinery recently ordered, will arrive in Butte to-morrow. The operations of the Parrot company, which is one of the wealthiest concerns in the Territory, may now be considered fully under headway. The Butte boom has received another impetus. —*Inter-Mountain.*

BRITISH COLUMBIA GOLD BEACHES.—Considerable interest was excited a few weeks ago by the return of Mr. Jenson from Cape Commerell, at the northern end of Vancouver Island, bearing with him a large quantity of black sand, which he had gathered on the beach and the bluff facing it. This sand has been submitted to rude tests, and gold has been found among it. In general appearance the sand resembles that obtained at Gold Bluff, off the California coast, where the deposits have been worked for many years with much profit. Black sand would seem to be characteristic of many localities along the Pacific coast, and its existence is variously attributed to the presence of veins of decaying quartz on the ocean bed, from which the sand and gold are freed by the action of the waves and thrown upon the beach. Far beyond Cape Commerell, away up in the frozen Alaskan regions, black sand is found. A party who recently arrived at Sitka brought a sack-ful of the sand which they obtained on the beach many miles north of the Aleutian Islands. At some not very remote day the deposits will be thoroughly examined and their importance determined. Our opinion is that they possess great value, and that the time will come when the black sand of this island will be considered of as much importance as its black diamonds.—*British Colonist.*

MEANING OF "SHASTA."—We copy, says the Shasta *Courier*, the following from the first number of the Shasta *Republican*, published October 20, 1855: The word Shasta is derived from the Russian language. Many years ago, and among the first travelers who visited this portion of the Pacific coast, was a party of Russians who passed through California, going from the north to the south. They gave a name to many of the more prominent landmarks which they encountered in their journey. To the peak now called Shasta Butte, a mountain clothed with eternal snow, and the highest in California, they gave the name of "Tcheste," signifying chaste, pure. Subsequently travelers and geographers changed the name to "Tchasta," which was again changed, after the discovery of gold, to the present word "Shasta." When the counties of the State were first organized, Shasta Butte was in Shasta county. Afterward a new county was formed (Siskiyou) which embraces this lofty mountain within its boundaries.

The Alice gold and silver mine in Montana paid its fifth dividend of $40,000 in New York on the 15th.

The Demand for Labor.

There could hardly be any surer indication of the life now inciting the industries of the United States than the demand for labor, which seems to greatly exceed the supply notwithstanding the unparalleled immigration from the laboring classes of Europe. The country is growing and advancing from side to side and end to end, and all who have the disposition to labor, can secure the opportunity. This is in marked contrast to the condition of affairs three years ago, and it shows that the era of depression, born of the extravagance of war times, has passed away. The people were forced to return to something like the old-time economies and thrift, and the result came more quickly than anyone thought, in the reawakening of the nobler industries and the general prosperity secured thereby. How long the present era will endure no one can tell; but unless it should proceed into one of undue expansion and extravagant outlay, there is no reason to anticipate anything but a steady growth and development of the country, in accordance with its wealth of resources and manifest destiny.

As an indication of the demand for labor, which we have cited as a sign of productive vigor, nothing can be more emphatic than the condition of affairs at the great headquarters of immigrants at New York city. A dispatch thence last Friday is as follows:

An unusually large crowd of immigrants swarmed Castle Garden yesterday. An increasing number of applications for help are being received in the Labor Department from all parts of the country. Servants and workingmen are in pressing demand. In fact, it was impossible to supply the wants of the country. For the six months ending July 1st, 19,000 men and 5,000 women were sent away from the Labor Bureau of Castle Garden to different parts of the United States. The Fruit Growers' Association of Sumner county, Florida, sent a communication asking for able-bodied workingmen to be forwarded to them immediately to work in the orange groves and gardens of that county. Similar letters were received from other parts of the South and West. Fifty immigrants were sent to the Kansas City Smelting Works in Missouri. Fifty more are expected to leave to-day to work on the Texas-Pacific railway, where they are to have $1.50 a day for two months, and then to receive the usual wages of the region. Out of their first installment of wages $3.50 is to be deducted for the expense of transporting them to Texas. The Superintendent of the Labor Bureau says that he has stopped answering letters asking for labor, as it is impossible to fill the orders. There are applications on file now for more than 500 house servants, and for any amount of female factory hands to go South, where it is said that hands can make from $2 to $3 per week in the factories.

In our own State, there is a good demand for labor, and the ranks of the unemployed have become exceedingly thin. It is, however, just at present the harvest season, both in grain field and orchard, and there is usually plenty to do for all who have the disposition to earn their bread. The true test of the condition of labor demand and supply here will come later in the year. We expect there will be more chance this fall to secure a hiring for the winter than there has been heretofore, and the city crowds will be smaller and the strolling beggars fewer. There are now so many progressive enterprises under way, both in agriculture and in manufacturing, that the call for trustworthy hands will be certain. It is true that there are many Chinamen now arriving, but as there is apparently more for the Caucasian to do, there is little complaint being made. It is difficult to see how the present fruit crop, which is bringing such fine prices, or the immense grape crop now ripening, could be handled at all without Celestial aid.

SILVER IN SANDSTONE.—John Murphy, a prospector, arrived in Butte several days ago from the Yellowstone country, bringing with him some specimens of what he claims is silver-bearing sandstone, a ledge of which he discovered in the Crazy mountains, in the vicinity of Mammoth Hot springs. The ore is identical in appearance with that produced from the sandstone reefs of southern Utah. Scientists for a long time ridiculed the idea of sandstone carrying silver, but the notion has been dissipated by the results of mining operations in Silver Reef. Mr. Murphy is quite sanguine of having struck a bonanza; and though the surface rock, which has been assayed in Butte, shows but a small value in silver, he is quite confident that the development of his claim will result in the discovery of paying ore bodies. He will return to the scene of his discovery in a few days.—*Inter-Mountain* (Montana).

OPINIONS AS EVIDENCE.—All persons do not sufficiently comprehend the difference between an opinion and a fact. This is especially true of mechanics, who are sometimes apt to put one forward in lieu of the other. One man says, for instance, that in his experience cast iron cannot be soldered, and when asked how he knows this to be correct, answers, that he has tried it and failed, and therefore knows that it cannot be done. This is merely an opinion, not a fact, because cast iron can be soldered as well as any other metal. By giving opinions or personal experiences as facts, many errors are perpetuated, for the reason that in making experiments, many persons omit important processes, without which, failure is certain.

MINE and prospect owners should guard against men who come West for the purpose of putting a small amount of money into mining property, taking a controlling interest, and locking the property up—too stingy and void of confidence to develop and improve the property. Such men do more to retard the progress of new mining camps than all the Indian scares and snowstorms of one year.—*Albuquerque Journal.*

The Engineer.

Bold Engineering.

The high and almost perpendicular banks nf the Hudson river, near Cornwall, is at this time daily swarming with men, clinging like lizards to the face of the rock, and working 75 ft. above the surface of the water. Here and there are laborers hanging (for the foothold they obtain is hardly worthy of the name) by ropes fastened many feet above their heads, and circling their waists. As a steamer was recently passing this point, the passengers gazed in amazement at the singular spectacle; and when one of the men, turning toward tho steamboat, waved his hand, cheered, and, falling off, swung for a moment, and then, getting his feet to their former place on the rock, renewed his work at cutting into its face, the spectators from the river sent back an answering cheer, as the boat swept around the point that hid the workmen from their sight, and left them discussing what they had just seen.

These men are employed hy the Ontario and Western railroad company, constructing the new North River railroad, which is to run from Jersey City to Cornwall, and thence west to Middletown. The country through which it passes is so rocky and mountainous that much of the work has to be done by blasting, and this is especially the case between West Point and Cornwall. At West Point, a tunnel 150 ft. deep and 500 ft. long, has been cut through Target hill, and many other bores, nearly as extensive, have been made. But the point already mentioned, near Cornwall, presented, perhaps, the greatest difficulties to the engineers and contractors. About 80 men are employed there, and they are selected on account of their activity and freedom from nervousness. The workmen are for the most part Italians, who are considered best adapted to this peculiar work, not only because they are lithe, light and active, but on account of their ability to endure the fierce heat that beats down on the exposed face of the rock.

New Form of Plates for Iron Clads.—At a recent meeting of the Engineers Club of Philadelphia, Prof. M. L. Haupt read a paper describing a system of deflecting armor for seacoast defence, designed hy Mr. N. B. Clark, Past Assistant Engineer United States Navy. The inventor's improvements are based upon the fact that it is much simpler to resist the effect of a projectile hy deflecting it than by opposing it by thick masses of inert matter, as is evinced by the "ricocheting" of a shot upon the water. He protects all the vital parts of the vessel by an iron shield, convex upward, placed below the water-line, and so curved that a shot cannot strike point blank. It is claimed that hy this means a great economy is effected in the weight of metal required for attack and defence; the vessel is more readily handled, more seaworthy, and is invulnerable. The principle may he applied equally well to the construction of batteries for defence on shore.

A Novel Project.—It is no new thing to transport fluids, gases and even solids hy means of tubes, pneumatic or otherwise; but now it is proposed to pass human beings through tubes from one point to another, but not exactly in the same way as fluids and gases or letters are passed through. Mr. Bradley Leslie, the engineer of the East India railway company, proposes to travel into France through a steel tube submerged 40 ft. below the surface of the water. The tube would he so ballasted as to make it weigh 1¼ tons to the foot less than the water displaced, its buoyancy being counterbalanced by moorings at every 250 ft. At the shore ends it would be laid in dredged or excavated channels, and would he made to rise from the mid-channel depths hy easy gradients. The cost of carrying out this scheme is estimated at $40,000,000.

Swiss engineers have employed the principle, found so useful in coal mines—of drawing up empty cars by the superior weight of loaded cars descending the incline—on a passenger railway at Brienz. From the landing at that place to the plateau at the top of the falls of the Geisshach the road is furnished with two coaches attached to an endless steel rope. In place of an engine to drive this cable, a tank is attached to each coach, to he filled with water at the top, and emptied at the hottom, thus ascending empty and descending loaded. Thus the force of inertia that carries one coach down causes the other to go up. Instead of a double track, a single track with an automatic turnout in the middle is employed.

Scientific Engineering.—A curious fact and one showing the value and percision of modern engineering may bo mentioned in connection with the recent picking up of one of the Atlantic cables, which became useless some 10 years ago, and which has since been lying neglected on the hottom of the Atlantic at a depth of some 2,000 fathoms. The location of the fault, with so much exactness, and the small expense of picking up and repairing the cables at a slight comparative cost, gives additional value to ocean telegraph property, and increased confidence in that scientific engineering which is able to calculate so closely into such hidden mysteries.

Useful Information.

A Diamond Tester.—A correspondent of the Rocky Mountain *News* tells of an amusing incident that occurred lately on a train that was crossing the Rocky mountains: A traveling peddler undertook, in the cars, to sell a large "diamond" ring to a miner who had made his pile. "Humph," said the miner, after critically examining the ring, "they've got common stone up in tho diggings where I've been that'll cut that diamond all to pieces." "If you'll find a piece of stone that will cut that diamond, I'll give it to you," replied the peddler. "All right," said the miner, "if I can't cut that 'diamond' with a stone I'll buy it of you." Thereupon the miner took the ring in his hand, and pulled from his pocket a small piece of brown-looking stone, similar to a bit of brown free-stone, except the grain was very fine, and with this he proceeded coolly to cut and scratch the "diamond" with several ugly-looking gashes. A group of passengers that had gathered about the miner were amazed, but, while they smiled, the peddler with the "diamond" withdrew discomfited. "That little piece of brown stone," explained the miner, "is a piece of corundum that I got in the Rocky mountains, and it's the best diamond tester in the world. It won't scar a genuine diamond, but it will everlastingly cut up pieces of glass or quartz."

Bagging for Chemicals.—A patent has been taken out for making bagging which resists chemical action. The bagging is plunged in the following solution at 60° C. (142° F.) and left for an hour. Sulphate of alumina, 1 kilometer; water, 25 liters; borate of lime, 1 kilometer. The borate of lime is added after the sulphate of alumina has dissolved in the boiling water, and the whole decanted when settled. After taking out of this bath, the textiles are put in a second bath composed of 1 kilometer of resinous soap and 1 kilometer of Marseilles soap, dissolved in 25 liters of water and carried to the boiling point. At the end of ten minutes the cloths are allowed to drip, and dried, and then re-washed and dried. Bagging made in this way will, it is claimed, resist the action of any acids or chemicals put into them.—*Druggists' Circular.*

Imitation Amber.—Considerable quantities of beautiful objects of artificial amber are now being produced in Vienna. The substance employed in its manufacture is chiefly colophony or resin, obtained by decomposition of turpentine, though several other ingredients are used to give it the requisite qualities. The imitation is said to be perfect, and the production has even the electric properties of true amber. Ingenious manufacturers have even introduced into the substance foreign bodies, insects, etc., to make the similarity more striking. Natural amber requires a temperature of 285 deg. to 287 deg. C. to fuse it, while the imitation becomes liquid at a much lower temperature.

Waterproof Cement.—For a waterproof cement, the following has been given: Boil one lb. of best glue in two quarts skimmed milk instead of water. This will he proof against damp or moisture. Another good cement for this purpose is made by boiling a pound in weight of linseed oil, stirring in quicklime till a good thickness, then pour out on a flat slab or tin plate, keeping in the shade; the cakes will become hard, and are easily melted like common glue.

To Clean Smoky Walls.—Brush them with a broom, then wash them over with strong pearlash water, and immediately rinse them with clean water before the pearlash is dry. When dry, give the walls a thin coat of freshly-slacked lime, containing a liberal proportion of alum dissolved in hot water. Finish with whiting and good size. Be careful not to apply the size distemper till the lime-wash is dry, as the latter will destroy the strength of the size, if the two come in contact while wet.

Cement for Gutta-Percha.—To make a cement for joining gutta-percha belts, the following has been given: Melt two parts of common black pitch to one part of gutta-percha. Make ready the two ends of belt to be joined; heat them by holding a red hot iron over them; then smear both ends with the hot cement; stick them together and apply a heavy pressure for several hours.

For Kindling.—Pine cones are said to he very generally used in Europe for kindling coal fires. When dry, they are readily ignited with a match, and are free from dust and insects. Two of them are enough to start a fire of wood, and a handfull suffices to start a coal fire. The hint might be made useful where bituminous coal is the common fuel and pine cones are abundant.

Reviving Inventions.—Says an Eastern paper, there are in the archives of the Patent Office thousands of applications which have been allowed, but on which the final Government fee has not been paid. The business prosperity of the country seems to have had the effect of starting many of these to life, and now more or less of them are daily being put into the issue.

A piece of zinc placed on the live coals in a hot stove will effectually clean out a stovepipe, the vapors produced carrying off soot by chemical decomposition.

Oil of Coffee.—Dr. C. O. Cech, of St. Petershurg, obtained this article by the following process: He pounded up 50 lbs. of different kinds of coffee in a mortar, and then treated it with alcohol and ether, obtaining about 1.2 grams (2½ lbs.) of oil of coffee. The beans extracted hy him were not of equal value as regards the yield of oil, for while some contained as high as 13%, other kinds fell below 8 . The oil of coffee obtained was a thick, green, transparent oil, and after some time a few long needle-shaped crystals were deposited from it. These proved to he caffeine. Since caffeine is not extracted from the exhausted beans by ether, and very little of it is taken up by the alcohol employed, the coffee from which the oil has been extracted could be employed for the manufacture of caffeine. The coffee oil became turbid in half a year, although it was kept in hermetically closed bottles. Small groups of crystals were formed in the middle of the liquid, and slowly settled to the bottom, and at the end of three years the bottle was two-thirds full of a dirty mass of crystals, consisting of the solid fatty acids, but the upper layer of the liquid remained for years transparent clear, and of a beautiful green color, proving that a portion of coffee oil consists of liquid oleic acid. The percentage of composition has not yet been defined.

Paper Plates.—The latest application of paper is tho adoption of paper plates by some of the great restaurants in Berlin, Germany. The innovation was first introduced during the summer of last year by the adventurous landlord of a much-frequented open-air restaurant. Every customer who ordered bread and hatter, rolls, cakes, buns, or similar articles, had them served to him upon a paper plate, made of a light *papier mache*, adorned with a pretty border in relief, and having at a first glance a great similarity to porcelain. Guests; waiters, and hosts were all pleased with the novelty; it saved the waiters many a deduction from their wages on account of breakages, which the deftest and cleverest of *Kellners* can scarcely avoid when he handles hundreds of pieces of crockery during a single afternoon and evening. The paper plates were so cheap that the landlord did not care to assert his ownership over them, and his customers were allowed to carry them away, like the pretty *serviettes* of thin paper used in so many restaurants in Holland. There was also a considerable saving of the time lost, and the chances of accident incurred, in the cleansing of the earthenware pottery. The success of the experiment has been so marked that the new species of plates is likely to he introduced into a great number of restaurants.

Good Health.

Finger Nails.

Our finger nails grow out about three times a year; they should he trimmed with scissors once a week, not so close as to leave no room for the dirt to gather, for then they do not protect the ends of the fingers, as was designed by nature; besides, if trimmed too close at the corners, there is danger of their growing into the flesh, causing inconvenience, and sometimes great pain. The collections under the ends of the nails should not he removed by anything harder than a brush or a soft piece of wood; nor should the nails be scraped with a penknife or other metallic substance, as it destroys the delicsey of their structure and will at length give them an unnatural thickness. We are not favorably impressed as to the cleanliness of a person who keeps his nails trimmed to the quick, as it is often done to prevent dirt gathering there; whereas, if a margin were allowed, it would be an index to the cleanliness of the hands, from which the collections under the finger nails are made. Leave a margin, then, and the moment you observe that these collections need removal, you may know that the hands need washing, when they and the nails are both cleaned together.

Most persons are familiar with those troublesome hits of skin which loosen at the root of the finger nails; it is caused by the skin adhering to the nail, which, growing outward, drags the skin along with it, stretching it until one end gives way. To prevent this, the skin should be loosened from the nail once a week, not with a knife or scissors, but with something blunt, such as the end of an ivory paper cutter; this is best done after soaking the fingers in warm water, then pushing the skin back gently and slowly; the white specks on the nails are made hy scraping the nail with a knife at a point where it emerges from the skin.

Biting off the finger nails is an uncleanly practice, for thus the unsightly collections at the ends are kept eaten clean! Children may be broken of such a filthy habit by causing them to dip the ends of their fingers several times a day in wormwood hitters, without letting them know the object; if this is not sufficient, cause them to wear caps on each finger until the practice is discontinued.—*Hall's Journal of Health.*

How to take Quinine.—Half a grain of quinine in two ounces of milk produces no disagreeable taste in the month, and this same quantity (half a grain) in a glassful of milk is scarcely perceptible. This is an easy method of administering quinine to children and delicate patients who object to the hitter taste which it leaves in the mouth,

The Feeding-Bottle and its Dangers.—The newly-formed Paris Municipal Laboratory has to justify its existence, and will no doubt do so if it can establish the truth of the facts stated in the following paragraph. Some feeding-bottles having a fetid odor were lately brought hy Dr. Du Mesnil from a *creche* to the Paris Municipal Laboratory for examination. M. Fauvel found that the milk remaining in all smelt badly, was acid, and half coagulated; the globules were deformed, and numerous very lively bacteria, along with some vibrions, were present. On cutting open the caoutchouc tube throughout its length, coagulated milk with small organisms was met with; but a still more important fact was the presence in the nipple of a mass of vegetation of cryptogamic nature. Sown in whey, this developed considerably in a few days. A visitation of all the *creches* was arranged hy the police and medical authorities, and the following was the result: Of 31 feeding hottles examined in 10 *creches*, 28 contained, in the nipple, the caoutchouc tube, and in some cases in the glass bottle, vegetations of the kind indicated, as well as hacteria, etc. Several that had been washed carefully, and were considered ready for use, still contained these cryptogams. Two feeding-hottles in a very bad state were found to contain pus and blood corpuscles; the children who had used them had injuries in the cavity of the mouth. It is thus probable that saliva enters the feeding-bottle, and its ferments are added to those of the milk. The acidity of the milk is attributed hy M. Fauvel to the bacteria present. If further investigation proves that the observations above recorded are generally accurate, it will be desirable to recommend the frequent use of Condy's fluid, or some such agent, wherewith to wash out the bottles and tubes.—*Chemist and Druggist.*

Some New Facts about Rabies.—It is known that M. Pasteur is directing his attention to the subject of rabies. The virus of that disorder, of course, exists in the saliva, but M. Pastour has now proved that it does not exist there only. The brain substance also contains it, and, used to inoculate healthy animals, will reproduce the disease as effectively as the saliva. Matter from the medulla oblongata and the frontal portion of one of the brain hemispheres and the liquid of the brain have been thus employed with success. Again, one of the greatest difficulties in researches on rabies arises from the uncertainty of development of the evil after inoculation or a hite, and the long time of incubation. M. Pasteur is now able to communicate the disease surely, and to shorten considerably the time of incubation. His method is to inoculate directly the surface of the brain, having recourse to trepanation, and using as inoculating matter the cerebral substance of a mad dog as pure as possible. In that case the first symptoms of rabies appear infallibly in a week or two, and death ensues in less than three weeks. In these researches, of which we may expect to hear more shortly, M. Pasteur has the co-operation of MM. Chamberland, Roux and Thuillier.

Relation of the Nose to the Face.—A somewhat singular fact has been observed with reference to the shape of the nose, or rather the setting of it in the face, so to speak. To be strictly correct, from the artist's point of view, the nose should be accurately in the middle of the face, and at right angles with a line from the pupil of one eye to that of the other. As a matter of fact, it is rarely or never thus placed; it is almost invariably a little out of the "square," and the fact of its being so is often that which lends a peculiar expression and piquancy to the face. A medical writer points out that there are anatomical reasons why a slight deviation from the true central line may be expected, and that the nose which is thus accurately straight between the two eyes may after all be considered an abnormal one; the only absolutely true and correct organ being, in fact, that which deviates a little to the right or left.

The Eucalyptus as a House Plant.—Prof. J. L. Budd thinks the Eucalyptus Globulus, which has done such wonders in arresting malarial disease on the fatal Roman Campagna and in other places, acts not only by the immence transpiration from its leaves, which soon distil the juices of the soil, but from actual antiseptic emanations, and by the absorption of deleterious gases. Wounds are healed, and foul sores purified hy an application of the leaves. He advises their growth as a house plant, and says that a plant of his in an eight-inch pot, three years from the seed, remains at about five ft. without losing its large, handsome leaves.

Killed by a Spider.—On Tuesday of last week, says the Boston *Post*, of a recent date, Chas. H. Jellison, son of Frederick Jellison, of Biddeford, Me., was bitten by a black spider, from the effects of which he died. On Tuesday morning, when the boy came out of his room, he informed his mother a spider had bitten him. But little notice was taken of the bite, which was just over one of his eyes. It commenced to swell, and Friday they called a physician. At this time the boy's face was very much swollen; he was delirious, and his pulse had arisen to 160. He died on Monday morning.

The horn of a rhinoceros, when cut through the middle, is said to exhibit on each side the rude figure of a man, the outlines being marked by small white strokes.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:
Saturday Morning, August 6, 1881.

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Passing Events.

The local event of the week has been the opening of the Mechanics' Institute exhibition of this city, which, as we now write, is in full progress. It is too early for us to have any extended description of the features of the exposition, but as it will continue open several weeks, we shall have ample time to do so. Suffice it to say for the present that the exhibition shows every evidence of being the most successful ever given by the Institute.

Our readers will find on the first page, a very valuable map of the Wood River section of Idaho, engraved specially for the PRESS. With it is a well written and comprehensive descriptive article written by the special correspondent we have sent over there to gain facts for us.

The Miners' Association of California have this week issued an address to the public (which we give in full in this number), showing up in a clear and dispassionate manner the position of the miners in the debris controversy. It is a perfectly plain and truthful statement, and worthy of perusal by all fair-minded men, to whom we commend it. At the same time we must compliment the directors of the Association for its candid and dispassionate tone.

This may be called the era of railroad building on this side of the continent. Both north and south of us roads are being surveyed, laid out and built, and ere many years there will be an immense tract of new country opened for settlement.

A FORCE of 6 men started work on the Keystone copper mine, Copperopolis, two weeks ago, but they have been discharged and work stopped for the present.

Ratio of Accidents and Production in Mines.

There is a certain ratio between the amount of ore raised in the mines and the number of men employed. In this country we do not keep these statistics accurately, but in England where they have government inspectors of mines whose duty it is to report all such things, they are kept carefully. The reports of these inspectors have just been published. By this statement it appears that on the average, in 1880, in Great Britain and Ireland, there was at all the mines under the Coal Mines Regulation Act, one fatal accident amongst every 595 persons employed in and about the mines, and one death by accident amongst every 368 persons employed; also that 198,119 tons of mineral were got for each fatal accident, and 122,509 tons for each death by accident. In the preceding year (1879) the fatal accidents and deaths in the proportion to the number of persons employed were one accident and one death respectively amongst the numbers of 610 and 490, whilst in proportion to the tons of minerals raised the corresponding figures (1879) showed one accident and one death for the quantities of 185,890 tons, and 149,400 tons respectively, showing for the year 1880 an increase of production per fatal accident, and a decrease per life lost.

The summary of fatal accidents and lives lost in and about the mines shows that at the mines classed under the Coal Mines Regulation Act, in Great Britain and Ireland, the fatal accidents were 815 in number, and the deaths occasioned thereby (some of the accidents causing more than one death) amounted to 1,318; showing an increase upon the previous year of 33 in the number of fatal accidents, and of 345 in the number of lives lost.

In another summary it appears that in the aggregate, 484,933 persons were employed in and about the coal, fireclay, ironstone, and shale mines of Great Britain and Ireland, exclusive of those employed in and about mines which are classed under the Metalliferous Mines Regulation Act. The number and ages of the persons employed underground are distinguished from those employed above ground. Of the total number of persons employed, 391,381 were underground, and 93,552 (of whom 4,640 were females) above ground. Compared with the returns for the previous year an increase of 8,123 is shown in the number of persons employed.

Academy of Sciences.

The regular semi-monthly meeting of the Academy was held on Monday evening, President Davidson in the chair. David Cahn was elected a life member, and Chas. Nelson and T. M. Whitelaw, resident members.

The donations to the Museum were as follows: From J. H. Strowbridge, a supposed upper stone of hand mill, found one ft. below the surface in making cut for S. P. R. R. on banks of San Pedro, Arizona; also two fossil shells from the banks of Rio Grande river, Arizona. From George Lovelock, four shell ornaments made of red adobe (*Haliotis rufescens*), found in beds of gravel near the shore of Humboldt lake, Nevada. Also, from same, a tomahawk or battle ax, dug up after the water had receded from the bottom of Humboldt lake, Nev. From Geo. Davidson, Jew fish (*Steriolepis gigas*, Ayres).

Mr. Redding called attention to the fact that Capt. Mallon had presented a curious Indian dress or mat, found in a bed of rock salt near the bank of the Colorado. Mr. Redding, being much interested in this evidently very ancient and curious relic, had written to Capt. Mallon for further information. Mr. Bonelli, who had given the matting and wood to Mr. Mallon, wrote a letter to Mr. Redding in answer, which he read. This letter described the locality in, and circumstances under which, the relic had been discovered.

Dr. Stout, who had visited the great salt mines of Krakon, described how the gradual movement of the salt filled up the drifts and tunnels so no traces remained, and suggested that perhaps this Indian dress had been covered up by the gradual movement of the salt deposit, where it had been found.

Mr. John Richards read a very interesting and valuable paper "On the Application of Standard Measures to Industrial Processes." We shall shortly give this paper in full, and prepared as it has been by a man of wide experience and thorough knowledge of the subject, it will be found of great interest.

Prof. Davidson stated that he would shortly start out to view the Yolo base line, and that new instruments would be used in the work. On his return he would give to the Academy the results of his observation. Owing to the lateness of the hour, several papers announced were deferred. One of these was by W. G. Fisher, "On the Earthquakes of September and October at the Island of Ugamok, Alaska." Another one was by H. D. Woolfe, "On Aleutian Family names."

A MINERS' UNION has been organized at Forest City, with a large number of names upon its roll.

The Facts About Gravel Mining.

Statement of the Miners' Association of California.

The following lucid statement of the Miners' Association of California, gives in better form than has yet appeared, the real facts about hydraulic mining in this State, and explodes many exaggerated statements of the injuries done; shows the necessity to the country of the gold product, and the desire of the miners to aid the farmers. We give the statement in full, and refer our readers, also, to the other elaborate statements by the well-known engineers, Hamilton Smith, Jr. and Col. G. W. Mendell, U. S. A., on the same subject, published in the last number of the MINING AND SCIENTIFIC PRESS:

SAN FRANCISCO, Aug. 1, 1881.

So many misleading arguments have lately been made to the public, antagonistic to the business of hydraulic gravel mining, that we deem it our duty to make the following statement, showing the facts as they actually exist, which we trust will receive that dispassionate consideration by the people of the State, which the importance of the issues at stake demand.

Character and Importance of the Mines.

California has produced since the discovery of gold in 1848, between $1,100,000,000 and $1,200,000,000 of that metal, of which very much the larger portion has come, either directly or indirectly, from the ancient or pliocene river channels. Fully nine-tenths of the placer gold thus far produced was the result of the natural washing away of these channels; the earthy matter having been carried down into the plains and inland lakes, thus building up the great valley of California; the gold, by virtue of its great weight, remaining behind in the beds of the ravines and rivers draining the western slope of the Sierra.

As the placers became exhausted, the miners naturally turned their labors toward the sources from which the placer gold had been derived. Commencing in 1851, they have steadily prosecuted the development and working of the ancient river beds, until the yield from them amounts annually to a sum varying from $11,000,000 to $13,000,000, with the prospect for many years to come of equally great returns.

Expenditures of Capital.

In order to accomplish this result, the expenditure of large sums of money has been required in building dams, canals and tunnels. The Bloomfield and Milton companies afford a good illustration of the large capital necessary for the successful development of such properties. Work was vigorously commenced on the mines of these companies in 1854, since when about $4,000,000 has been expended—all representing "capital account"—until 1878, when their works were finally completed. All this $4,000,000, with unimportant exceptions, was furnished by stockholders resident in California.

Value of the Mines.

We roughly estimate the present actual value of these mines in California to be $80,000,000; adding to this the property whose value is dependent upon the existence of the mines, there results a total present value of probably $100,000,000.

The owners of the gravel mines have been content with smaller returns from their investments than from ventures either in gold quartz, silver, copper or coal mines. They believed that the undoubted extent and permanence of the auriferous gravel beds warranted the opening of mines, promising comparatively moderate profits. At the time when by far the larger part of these expenditures of capital had been made, the right of the miner to deposit his "tailings" in the river beds was accepted by the whole State as a matter of course.

These vast investments have been made in good faith, and now demand equal protection of the law with other property.

It is falsely asserted that the stoppage of these mines would only involve the destruction of the capital placed in them, "most of which is owned by foreigners," and would inflict but little injury upon the people of the mining counties, "Chinamen, powder and water being the forces employed."

To this appeal to the passions and prejudices of the community, we can state with authority, that the percentage of Chinese compared with whites, employed in our mines, is far less than is the case at the valley farms; not one of the leading mines of the State now using Chinese labor; that out of many hundreds of mines there are only three or four held by owners not residents of the United States, and, moreover, that the net return from these three or four mines has been quite moderate.

The Injury to be Wrought by Abandonment.

The repeated assertions that the mountain counties would be but slightly injured by the discontinuance of gravel mining are so absurd to one at all familiar with these localities as to be hardly worth the trouble of refutation. For the benefit of persons who have no knowledge of these counties we will, for illustration, state the present condition of Nevada county. This county owes no debt; its taxes are low; has a population of fully 21,000 souls; has an assessed value for taxation of over $9,000,000; its inhabitants, including the daily laborers, generally own their own comfortable homes; neither in California nor elsewhere can be found a more truly prosperous and contented community; the rate of wages is nearly double that paid in the valley counties; and the miners owning their own orchards and gardens, live in greater comfort than does any laboring class in any other part of the world. Fully one-half of this population directly depends for its subsistence upon hydraulic gravel mining. Were these mines abandoned the county assessment roll would be reduced one-half; the burden of taxation would be consequently doubled on the remaining property, and depopulation and ruin would follow.

The same condition of affairs would obtain in the counties of Placer, Sierra, Plumas and Trinity, while the lower counties of Butte and Yuba would be greatly injured.

We recognize the fact that injury has been inflicted upon the farmers of Sutter and Yuba counties, but we claim that it is neither right nor expedient to destroy these prosperous mining communities because of this injury. To this point, which seems utterly misunderstood, we ask attention.

Equities of the Miners.

It is assumed that so-called hydraulic mining differs from other methods of gold mining, whereas it is absolutely identical in principle with the processes involved in either placer, drift or quartz mining. The theory of the extraction of the gold is the same; a stream of water washes away upon lower grounds, the earthy material in which the gold is embedded, the gold, by reason of its gravity, remaining behind.

In the early days of placer mining, when there were literally hundreds of thousands of miners washing the soil in every gulch, ravine and river of the Sierra, the aggregate quantity of material washed into the rivers must have exceeded the amount, which by improved, but similar appliances, is now being placed in them.

The best lands on the Yuba and Bear rivers were covered with mining debris by the great flood of 1861-2, most of which was unquestionably the result of placer mining.

The miners have gone on since 1848, following the same plan of work, but gradually, by the outlay of great sums of money, improving their earlier methods.

For nearly 30 years their right to thus mine remained unquestioned. Lately, however, the very men who came to California to work in the mines, who did work in them and contributed to cover up valley lands, who afterward settled as farmers upon the land below the mines, have discovered that it is only the farmer who has rights, and that the miner, to whom is so largely due the greatness of our State, has been an interloper and a destroyer.

When the orchards and rich bottom lands near Marysville and Wheatland were covered with debris in 1862, then the farming community should have asserted its pre-eminent rights and have thus prevented the expenditure of vast sums, since used in developing the gravel mines. The truth is that when these expenditures were made, even the valley farmers considered hydraulic mining as legitimate an industry as agriculture.

It is erroneously stated that the Sutter and Yuba county farmers only wish to close the *hydraulic* mines. In the suit of Keys vs. Little York Co., etc., several drift mines were enjoined by the lower court from further working. The language of the injunctions granted, restraining the miners "from suffering to flow muddy water," if sustained by the highest judicial authority, means absolute destruction to all gold mining, for gold can only be gotten by muddying water.

In fact, carrying this legal principle to its logical conclusion, the agriculturist would not be allowed to cultivate the slopes of the mountains.

The only way by which the pristine purity of the waters of the State can be brought back is by driving out the present population and restoring the land to the nomadic Indian, for when civilized man touches the soil, the rivers inevitably become muddy, as has been notably the case in the Ohio and other valleys of the Eastern States.

Need for the Gold.

The gravel channels of California have yielded in the past, near $1,000,000,000 in gold, which has been a mighty force in bringing about the existing prosperity of the civilized world. A still greater quantity remains in our unworked but developed channels, ready for extraction.

It is a well recognized fact that only in California does there remain a large quantity of gold, the existence of which is definitely known.

The gold product of Australia and other parts of the world has been steadily decreasing for many years past, while only in California has the yield been sustained. In this State the minimum product of $15,300,000 was reached in 1877, since when it has been steadily increasing, until for this year, 1881, if the mines are not closed by the courts, it will reach about $19,000,000. Of this, as has before been stated, much the larger portion comes from the gravel mines.

Can California—can the United States suffer this great treasure to be forever locked up in our mountains?

Is it judicious to now insist upon such action by the courts, if it can be had, as will forever close these great treasuries against the State and the world?

Exaggerated Statements of Injuries Done.

The State Engineer, in January, 1880, after detailed and careful examination, reported that 43,546 acres of land had been depreciated in value by the flow of mining debris, with a result-

ing damage amounting to $2,597,635. This has been not very largely increased during the past year. These authentic figures are raised by our opponents to 100,000 acres, and to untold millions of loss.

The depreciation in values at Marysville is well known to be chiefly due to the construction of railroads and the exhaustion of the great placer mines on the Yuba and Feather rivers, which obtained their supplies from that city.

Should the mines all be closed, as many of the valley people now seem to desire, the still further decay of Marysville is assured, and we may add that the now prosperous city of Sacramento will suffer a loss from which it will be difficult for her to recover. That this decay of Marysville is not due to increased cost of river transportation is clearly shown by the fact that freights to and from that place and San Francisco, are now, at the present low water stage, as low or lower than they have been before.

The Rivers.

That the Feather and Sacramento rivers have been injured is conceded by all, but we have the official statement of Captain Eads—as competent an authority on such matters as can be found in the world—that if the flow of heavy sand is kept from entering these streams, they can readily, by proper treatment, be brought into excellent condition.

For two or three years past the prophecy of the approaching ruin of the San Francisco harbor has been allowed to slumber. There seems of late, however, some disposition to revive this charge, and, to those desirous of knowing the truth, we would refer to the testimony of Prof. Davidson, Chief of the U. S. Coast Survey, and to that of General Alexander and other able scientific gentlemen, taken by a Legislative Committee in 1878, in order to elucidate this question. It was then clearly shown that the water on San Francisco bar was as deep if not deeper than in 1848, and the falsity of this charge was fully exposed.

It seems to be taken for granted, that we have to deal in our California rivers with engineering problems more difficult of solution than have before been encountered. This is not the case, for both in France and Italy many of the rivers carry larger quantities of earthy material in proportion to the water, than does the Sacramento. In these countries no great difficulty has been experienced in protecting the lower lands and rivers.

Desire of Miners to Aid Farmers.

From the examinations and reports of our engineers we became satisfied, several years since, that it was practicable, at a comparatively moderate expense, to safely store for many years to come all the injurious flow of mining debris in the Yuba, Bear and American rivers, by forming reservoirs by the construction of brush and stone dams in the bottoms and canyons of those streams.

The State Legislature, in 1878, authorized the investigation of this question by a board of engineers. After elaborate surveys had been made the State Engineer reported that a sufficient remedy could thus be obtained, not only to guard against future deposits of debris, but also primarily to protect the rivers and valleys from the very many millions of cubic yards of sand and gravel, which had been accumulating in the streams since the floods of 1861-2.

It seemed unjust that the present generation of farmers and miners, living in the northern part of the State, should be compelled to pay exclusively for remedying damages caused by mining many years before, which had largely benefited the whole State, especially San Francisco.

With this in view, the now famous "Debris act" was strongly advocated by both miners and farmers, who, in that measure, asked for State aid, so that the necessary funds could be procured to inaugurate a thorough system of protection. In this legislation the miners showed their willingness to pay their full share of the burden, by being taxed in three different ways, and very much more heavily than any other class.

The Debris Dams.

Under the operations of this act two restraining dams were built in 1880, one across the Yuba and the other across Bear river, at a cost of nearly $200,000. The residue of the money procured by the taxes levied under the authority of the act, amounting to some $290,000, was spent chiefly in building levees for the purpose of confining the rivers so that they might, by scouring action, deepen their beds.

These works were hastily built, and, of course, are yet necessarily incomplete. The dams, although broken, have been of much service, the one on the Yuba river having, it is thought, saved Marysville last winter from inundation. Able engineers now report that the dams can be made permanent, and that they will answer the purpose for which they were designed.

It was never the intention of the mining interests to advocate the permanent continuation of a general State tax for this relief. It was hoped that the State at large would willingly contribute the small tax of five cents on the $100 for three years, and that after that time the parties directly interested could take care of the works at their own cost, and thereafter maintain and extend them as necessity demanded.

Useless Litigation.

The condition of affairs is briefly this. Engineers, as able as can be found in the United States, assert that the mines can be worked, that the valley lands at the same time, can be protected, and that the navigable water courses of the State can be brought into good condition.

In the face of these statements by scientific authorities, it is proposed to at once cut off from the annual revenue of the people of the State some $13,000,000. The ruin of the mining counties will then follow, and yet the danger from the vast deposits of debris now in the rivers will have to be met.

With no other result than the payment of huge fees to greedy lawyers, a multiplicity of suits has been commenced, when one alone would definitely settle the controversy.

It is with regret that we see hundreds of thousands of dollars about to be spent in bitter litigation, when the same money, properly expended, would so largely contribute to the relief and settlement of the injury done to the farmers.

It has been shown how idle are the statements that the product from our mines simply enriches foreign owners. The truth is that much the larger part of it is spent for labor and supplies, and that in the end most of it centers in San Francisco. Had it not been for the mining industry that city would never have become the metropolitan and wealthy place it now is, but would, at the very best, have been a provincial town slightly superior to Portland. Can San Francisco afford to see one of the chief sources of its prosperity destroyed?

The individual members of this association are not alone engaged in mining, but are, many of them, also largely interested in agriculture, trade and manufacturing. They deprecate the attempts made to injure mining, not only because they believe it to be a legitimate industry, but because they realize that its destruction would most injuriously affect every material interest in the State.

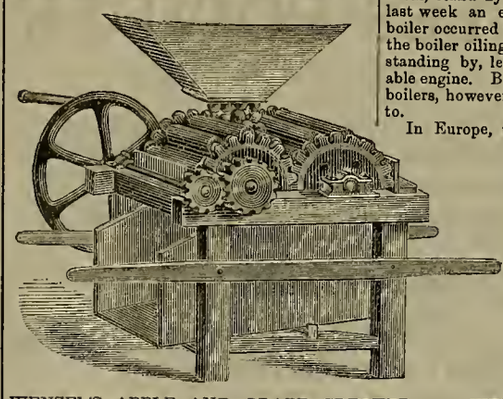
MINERS' ASSOCIATION,
By its Board of Council.

THOMAS BELL,	EGBERT JUDSON,
ALVINZA HAYWARD,	THOMAS PRICE,
WM. ASHBURNER,	A. A. SARGENT,
R. E. BREWSTER,	L. L. ROBINSON,
JAMES L. GOULD,	J. P. BROWN,
N. CADWALLADER,	J. S. MCBRIDE,

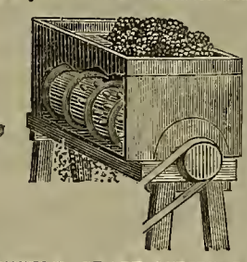
JAMES P. PIERCE.

A Curious Historic Relic.

Capt. J. A. Mallon recently sent to the Academy of Sciences, a very curious Indian dress or mat, evidently woven of some straw or plant, which was found in a salt bed near the Colorado river.



WENZEL'S APPLE AND GRAPE CRUSHER.



WENZEL'S GRAPE STRIPPER.

The specimen was apparently one of an age far previous to those of which there is any record in the country where found. Mr. Redding wrote back to Capt. Mallon for further information.

The specimen was found by Mr. I. D. Bonelli, of Junctionville, Lincoln county, Nev., in a ledge of salt situated six miles above the confluence of the Rio Virgin with the Colorado on the left bank of the Virgin. This ledge of rock salt belongs to a system or belt of the same, similar to the salt mines of Salzburgh and Krakow, in Europe, and may, like those, belong to the triassic age. Mr. Bonelli has regarded them, in the absence of any fossils to identify them by, as a part of the saliferous crust superincumbent on the silurian rock. No geologist has as yet given a definite opinion for want of time for extensive investigation.

The country rock in the neighborhood is the upper carboniferous, striated at intervals with trap rock of hornblende and mellifere. The red sandstone of the upper silurian is also found protruding, and the depression of the Rio Virgin river valley shows proofs of vast streams of water having flowed there probably at the period when the great inland lakes drew off into the western ocean.

There is evidence in the position of the salt ledges and the overlying cap rock that the volcanic eruptions of comparatively recent periods have plicated them, and the probability is that these relics accumulated in the caves of salt in the very earliest period of man's existence on the globe, when primeval man lived in their caves, which later on were upheaved and cap rock formed over them by accumulating of drift, sand and induration of the same.

This is the view taken by Mr. Bonelli of the relics and their history from the surroundings. He says: "No Indian living here knows anything of the time when these caves were inhabited. The present race does not occupy any of the caves that are now open. As the New York dandy walks over the Laurentian gneiss, older than all forms of life upon the globe; and, as we live and build upon the ruins of all the ages, so may a race of savages in the early periods of the cenozoic age have lived in caves in the salina of the silurian. If this is an erroneous conclusion, then it seems proven that vast upheavals and revolutions have occurred during the recent periods of geological and even perhaps historic or barely historic time."

When it is remembered, however, that in the salt mines of Krakow the gradual but sure movement of the salt beds fills up and entirely defaces all traces of the drifts and tunnels made in it and abandoned, a reason for finding this relic may be found. In these salt deposits the salt may, and doubtless does, move in the same manner, and in moving may have covered up the garment referred to and preserved it to the present day.

Improved Grape Stripper and Crusher.

The engraving shown herewith represents a combined grape stemmer and crusher, a patent for which has this week been granted through the MINING AND SCIENTIFIC PRESS Patent Agency, by George L. Wenzel, of this city. The larger machine, which is an apple crusher, can be used for crushing grapes as well. The upper one of the engravings represents the grape stripper. When used together, for grapes, the stripper is placed above and run by a belt from the crusher. These devices are more fully described under title of "Notices of Recent Patents," on page 92 of this issue.

Insurance for Boilers.

It is somewhat surprising, when one has been about mining boilers very much, and has seen the old rattle-traps doing duty which ought to have gone to the scrap heap years ago, that there are not more boiler explosions than do occur. Patched-up old pieces of rusty iron, carrying pressures that none but first-class boilers ought to be put to, are common. And it is strange that the people who own and run them, stand by them so long as they do. Only last week an explosion of a threshing-engine boiler occurred when the engineer was on top of the boiler oiling the engine, and the owner was standing by, leaning on the wheel of the portable engine. Both were killed. The stationary boilers, however, are more particularly referred to.

In Europe, they have boiler insurance and steam power companies, who inspect and insure boilers. The chief engineer of one of these companies, whose headquarters are at Manchester, in discussing the question of additional legislation effecting boilers, says that it is quite evident that the general adoption of independent inspection of boilers, coupled with insurance, throughout the country, would lead to a very great diminution in the number of accidents. If additional legislation be really necessary, all experience, in his judgment, goes to show that it is to the enforcement of efficient periodical inspection of boilers by independent persons other than government officials that attention should be directed.

This conclusion seems a valid one. We have a good deal of "red tapery" and not much good practical result out of Government inspection. The inspection seems more a matter of form than anything else. If, however, it were left to people whose principals had to pay for bad judgment, few poor boilers would be passed. Those companies whose business lies in this direction find a gradual increase in their operations. The one above referred to, in England, reports that operations of the company during the 12 months have been on a scale of much greater magnitude than heretofore, and they have also been unusually successful. Two thousand eight hundred and ninety-five boilers were proposed for insurance, being an advance of 840 over the previous year, and the largest number proposed in one year since the commencement of the company. In addition to the ordinary inspections, 13,071 thorough or internal examinations and hydraulic tests were carried out. Only one serious collapse of flue occurred, and not one explosion, fatal or non-fatal, for which the company were liable took place, although over 20,000 boilers were under supervision during the 12 months. From these figures some idea of the magnitude of the business may be gleaned.

THE lessees of the Phœnix mine have begun to ship ore to the Richmond furnaces.

Upper Wood River and Saw Tooth Mines.

(CONTINUED FROM PAGE 81.)

Smiley's or Emma, at the head of Smiley's gulch, has an incline shaft 65 ft. in depth, at the bottom of which a three-ft. pay streak is found, averaging $100 per ton. A tunnel is now being run to tap this ledge 200 ft. below the surface. The Pilgrim, Vienna and Columbia companies all contemplate the erection of mills with ample capacity as soon as the road, now in course of construction, is finished.

The numbers on the map correspond to the following list of mines:

1 Guy.	36. Black Hawk.	71. Shamrock.
2 Montezuma.	37. Yellow Jacket.	72. Signal.
3. Regulator.	38. West Fork, No. 2.	73. Western Home.
4. Boyle.	39. do, No. 1.	74 Adelaide.
5. Big Camas.	40. Big Beaver.	75. White Cloud
6. do, Ex.	41. Hancock.	76. Gladistor.
7. do, Ex.	42. Garfield.	77. Accident.
8. Bullion.	43. Elk Horn.	78. Little Chief.
9. Idahoan.	44. North Star.	79. Big Chief.
10. Mayflower.	45. Summit.	80. Eunice.
11. Jay Gould.	46. Paymaster.	81. J. Marion Sims.
12. O K	47. Boss.	82. Wood River.
13. Climax.	48. Silver King.	83. Baltimore.
14. Star.	49. Champion.	84. Dinero.
15. Minnie Moore.	50. Silver Fortune.	85. Lawrence.
16. Meyer's.	51. Ohio.	86. Grand View.
17. Penobscot.	52. Star Mountain.	87. Senate.
18. Bannack	53. Lulu.	88. Red Cloud.
19 Narrow Gauge	54. Bellevue.	89. Independence.
20. do, No. 2.	55. South Stockton.	90. Wellington.
21. Green Horn.	56. Stockton.	91. Leviathan.
22. Lucky Boy.	57. Edith.	92. Highland Chief.
23. Maud May.	58. Perry.	93. Vienna.
24. Occidental.	59. Mountain Lilly.	94. Justice.
25. Imperial.	60. Ornament.	95. Acturas.
26. Kit Carson.	61. Scratch.	96. Emma.
27. Saturday Night	62. Ohio.	97. Nellie.
28. Wood River.	63. Black Bird.	98. Atlanta.
29. Idaho.	64. Orient.	99. Naplas.
30. Ten Broeck.	65. Walton.	100. Scotia.
31. Ontario.	66. Rippetoe.	101. Lucky Boy.
32. Black Horse.	67. May Queen.	102. Pilgrim.
33. Ervin.	68. Saturn.	103. Saubeam.
34. Old Abe.	69. Wild Dutchman.	104. Beaver.
35. Lone Pine.	70. Town View.	105. Columbia.

This will prove one of the finest mining districts on the coast before the end of another season. The mountains in this part of Idaho are extremely high and rugged, but from Galena down, there are no obstacles to a railroad, and both the N. P. and C. P. companies already have parties in the field surveying for a route to the head of Wood River.

In less than two years hence the locomotive's whistle will shriek on the side of those grand, old peaks where only two years ago the mountain goat went undisturbed by human beings.

A. L. M.

Local Mining Laws.

In some new mining camps, because it is understood that the Government recognizes the regulations the miner makes, within certain bounds, it is frequently imagined that the miners can make any laws they choose governing locations, etc. This is by no means the case. So long as the local laws do not conflict with those of the general government, it is all well and good, but as soon as they do conflict, then the local law is invalid. This is a point which all miners should remember, and it may be impressed upon their memories by the following statement from the Commissioner of the General Land Office to a miner on the El Dorado canyon, Nevada:

In reply to your communication, I have to state that the United States mining laws provide that the locator of a lode mining claim must make the annual expenditures necessary for the maintenance of the possessory title at any time within one year from the 1st day of January next succeeding the date of the location; and the miners of a mining district have no authority to make any rule conflicting with this provision of law. If the mining laws of your district require that $50 shall be expended within 60 days after location, such provision is wholly without force. Suppose a location to have been made July 1, 1880, the $100 worth of expenditure is required by United States law to be made between the 1st day of January, 1880, and the 30th day of December, 1881, and expenditures made prior to this period, viz.: "within 60 days after location," would not be in conformity with the provision of said law.

THE IDA MINE'S STOCK.—The case of the Ida G. & S. M. Co., vs. F. W. Clute and L. F. Loveland, is on trial before Judge Pressley of Sonoma, sitting in this city in Judge Hayne's department. The company alleges that between February, 1878, and March, 1879, while Treasurers of the mine, the defendants received 10,000 shares to dispose of, which, it is claimed, they did for $1 a share. In September, 1879, they ceased to be Treasurers, and owed the mine $10,000, the amount realized from the sale of the shares, which is also the amount sued for. The defendants, on the other hand, claim that they were in the receipt of only 5,600 shares, which they disposed of for $4,470; and as they had expended $4,619 in behalf of the company in various transactions it owes them $149 56.

E. W. WOODWARD, D. B. Carver, William McCormick and Sylvaro Ruiu, have located an iron mine on the mountain east of Rutherford, Napa county, about a mile from the Whitton quicksilver mine. The locations, four in number, are each 60 by 1,500 ft., equal altogether to an area of 80 acres.

THERE is a scarcity of miners at Tuscarora The *Times-Review* says it does not desire to invite a stampede, but that all the mines are running short-handed and from 25 to 30 men could obtain work there.

California Mineral Springs.

California is exceedingly rich in mineral springs. Some of them have shown their value both in the hands of the chemists and the systems of the suffering and the afflicted. There are others which are strongly suspected of being very valuable, but there is yet no exact and trustworthy information concerning them. Several conscientious writers have done all they could to place the mineral springs of the State before the world in their true light, but their efforts have been incomplete, because the information they needed did not exist. It seems to us that the subject is a fit one for the expenditure of a small amount of the public money; in other words, that the State of California should do something to make its resources of this character known. It would be a good investment, judged from scientific and philanthropic points of view, and it is quite possible that something would be found which would attract the health-spring seekers of the world and hence fit them, while their money would assist in building up the State. The State Board of Health has shown its cognizance of the importance of our springs by mention of them in its publications, but these records, like those by private individuals, are incomplete. Let the State appropriate money enough to make official analyses of all waters which promise to be valuable, and let these analyses be set forth, and their significance set forth by some one able to make sound deductions in matters of this kind. Such a work prepared under the authority of the State, would have more weight than a private publication, although the latter, by some well-known man who had the resources and would be above the suspicions of interest in the ownership of the springs, would soon be accepted by the physicians of the world. The literature of mineral springs holds a prominent place in physicians' libraries at the East and in Europe, and their patients are sent here and there to reap the benefits which may be expected from waters with the specific properties desired in certain cases. California should certainly have a trusted position in this literature, and we think it would be proper for the State to arrange to occupy it.

MACHINE FOR PIECING OUT FLUES.—There is probably no work about a locomotive repair shop which is done in such a variety of ways as the piecing and welding of flues. In nearly every shop a different machine and process is employed in doing this work, some of which are quite ingenious, and generally, each one is claimed by its inventor as being better than any other. Messrs. Harts & Fox, of Cleveland, Ohio, have recently devised and patented a machine by which the different operations of cutting off, scarfing and welding the ends of the tubes are readily performed. They claim that the work by their machine can be done better and quicker than by any other process or tools now in use.

A NEW MEDICINAL FISH OIL.—The oil of the oolachan or boulican (*thaleichthys*), a fish inhabiting the waters of British Columbia and Vancouver's Island in enormous quantities, is finding its way into the English markets as a substitute for the cod-liver oil. This fish is of so oleaginous a nature that it is dried and used as a candle by the natives of British Columbia, being known by the name of the "candle fish." The oil has long been valued for its medicinal virtues among the native Indians, but has only lately been prepared in such a form as to compete with cod-liver oil, for which, however, it is said to be a valuable substitute.

AMERICAN CORNED BEEF, according to Mr. Wigner, in the *Analyst*, is twice as valuable as an article of diet as fresh boneless beef, and that the cooked ox tongues contain less salt and more nutritive matter than the dried tongues usually sold in European markets.

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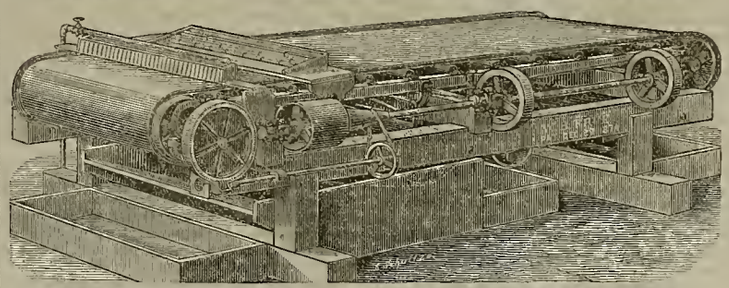

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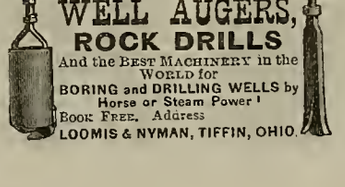

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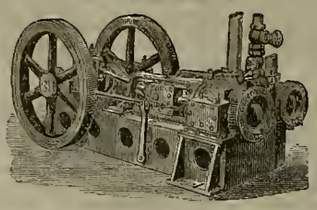

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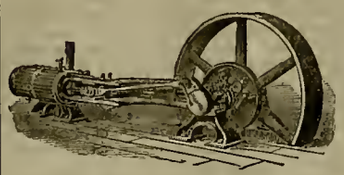

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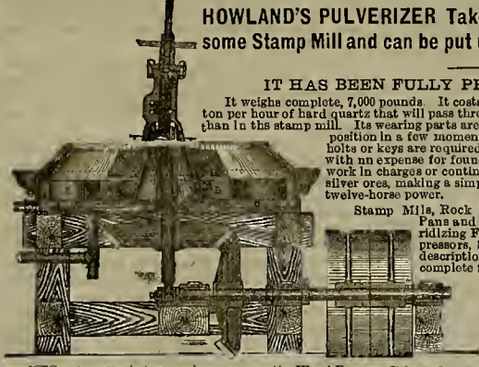

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SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.

☞Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.

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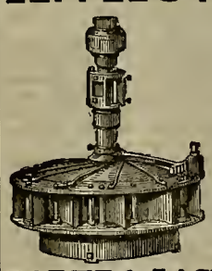
LEFFEL'S IMPROVED WATER WHEEL.



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The "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.
Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
JAMES LEFFEL & CO., Springfield, Ohio, and 110 Liberty St., N. Y. City.
PARKE & LACY, Sole Agents, 21 and 23 Fremont St., S. F.

STEEL CASTINGS
FROM 1-4 TO 10,000 lbs. WEIGHT.
True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
CRANK SHAFTS, SHOES, DIES and GEARING specialties.
Circulars and Price Lists free. Address
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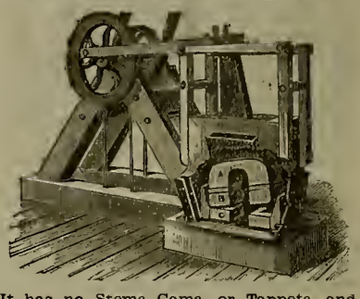
Works, CHESTER, Pa. 407 Library St., PHILADELPHIA

IRRIGATION! LAND RECLAMATION!
The Turbine Pumps.
3,000 to 15,000 Gallons a Minute. Strong, Durable & Cheap.
SAN FRANCISCO TOOL CO., No. 21 Stevenson St., San Francisco.

SELBY SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.
Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent.

HUNTINGTON'S Oscillating Stamp Mill



It has no Steme, Came, or Tappete, and Adjuete Itself to the Wear of the Shoee and Diee.
For Simplicity, Economy, Durability and Effective Working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power.

Price, 900-Pound Hammer, - - - $500.
" Double Mills, - - - - - - $950.
Price, 1200-Pound Hammer, - - - $600.
" Double Mills, - - - - - - $1150.
Send for Circulars and Testimonials.

SHINOLE MACHINES AND SAW MILL MACHINERY, STEAM ENGINES, ETC., TO ORDER. MINING MACHINERY OF ALL KINDS.
F. A. HUNTINGTON,
220 Fremont Street, San Francisco.

DuBOIS' Automatic Quicksilver Feeder.
A machine for feeding quicksilver to the mortars of GOLD MILLS. It is so connected to the cam shaft, that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a mechanical movement, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding ordinary hand-feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect. Price complete, $100.00. Send for circular.
P. C. DuBOIS,
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OTTOKAR HOFMANN,
(Of the Firm of Hofmann Bros.)
Metallurgist and Mining Engineer.
Erection of Leaching and Chlorination Works a specialty
Working Tests and Reports made.
415 MISSION STREET, SAN FRANCISCO.

LEOPOLD KUH,
(Formerly of the U. S. Branch Mint, S. F.)
Assayer and Metallurgical Chemist,
No. 611 COMMERCIAL STREET,
(Between Montgomery and Kearny,)
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All orders accurately and moderately carried out. (Send for Circular.)☜

1851. 1881.
DEPUTY U. S. MINERAL SURVEYOR.
Surveys for Location or Patent. Maps and Plans Drawn. Mining Properties of all kinds examined and careful reports made of the same. Consultations on Mining Investments. Address, THOS. W. REECE, CIVIL ENGINEER, Oroville, Butte Co., Cal. References given and required.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.]

FOR WEEK ENDING JULY 26TH, 1881.

244,961.—APPLE AND GRAPE CRUSHER—O. L. Wenzel, S. F.
244,875.—GALVANIC BATTERIES—Folkers Bros., S. F.
244,009.—SUBMERGED PUMP—F. D. McCarley, S. F.
244,749.—BORING MACHINE—Hammond & Holman, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

APPLE AND GRAPE CRUSHERS.—G. L. Wenzel, S. F. Dated July 26, 1881. No. 244,961. This invention relates to a combined apple crusher and grape stemmer, the features of which are peculiar. The invention consists in the ordinary stand and mechanism to operate the rollers. These rollers are of wood, and are constructed with alternate depressions and elevations, the depressions being made deeper than the periphery of the ends of the rollers, thus forming a basin, whereby the juice of the fruit is prevented from flowing out at the ends, but is carried down with the roller, and discharged into a receptacle. The elevations or ridges of one roller are so rounded as to fit exactly the depressions of the other, and *vice versa*. The hopper is set over rollers and its bottom is so shaped as to direct the fruit in small quantities upon the middle of the roller, immediately within the very bottom of the depression, where it will be cut and crushed by the elevation on the other roller. Over the hopper a frame-work is built, which supports a large roller, which revolves within a stationary wire netting. The roller is provided with certain wooden pegs or teeth and spirally running flanges, the former to catch and tear the stems against the grating, the latter to carry them to one side. The grapes are fed to this roller through an opening above it, and after being stemmed are discharged through the netting into the hopper. This device is illustrated on page 89 of this issue.

GALVANIC BATTERY.—John H. A. Folkers and A. H. B. Folkers, S. F. Dated July 26, 1881. No. 244,875. This invention relates to a certain improvement in electric batteries, and it consists in a new and useful means for securing the plates to the attachments by which they are supported within the device.

What They Say of Us.

A VALUABLE PAPER.—The MINING AND SCIENTIFIC PRESS is becoming more interesting every year. Like wine it improves with age. Its issue of June 18th is a remarkable number, containing 36 pages. It is brimful of entertaining and instructive reading for prospectors and miners generally. It contains a good miner's map of Arizona, as well as much information relating to that Territory. The PRESS is well filled with California mining news, etc. Every miner would certainly profit by subscribing for this greatest mining publication upon the Pacific coast. The paper comes at $4.00 per year, and it is worth it.—*Georgetown, (Eldorado Co.,) Gazette.*

THE MINING AND SCIENTIFIC PRESS of June 18th is a magnificent number of that excellent periodical. It contains 36 pages, and is devoted almost exclusively to a description of the resources of Arizona. The PRESS will soon issue a Montana edition. — *Inter-Mountain (Montana).*

THE S. F. MINING AND SCIENTIFIC PRESS has completed its 42d volume. It is the very best paper of its class published. It is the pioneer of the mining journals, and continues a long way ahead of its followers. It is published by Dewey & Co., and as a new volume begins with its next issue, now is a good time to subscribe for it.—*Silver State (Nevada).*

THE MINING AND SCIENTIFIC PRESS, published at San Francisco, by Dewey & Co., is a very instructive journal. It is an illustrated weekly, devoted to mining and scientific progress, and to general news. It is furnished for $4 a year, payable in advance. We welcome it to our table as an exchange.—*Del Norte Record.*

THE MINING AND SCIENTIFIC PRESS has just begun its 22d year. Every mining man ought to take the PRESS, and it is as good a family paper as this coast affords.—*Inyo Independent.*

THE Bodie *Free Press* takes notice of the fact that Eastern capitalists are investing heavily in the mines of Tioga district, a region perched on the summit of the Sierra, at an elevation of more than 10,000 ft. above sea level.

Opening Exercises of the Fair.

The opening exercises of the Sixteenth Industrial Exhibition took place on Tuesday at the Grand Opera House, and was largely attended by an appreciative audience. The programme was as follows:

Grand opening overture, orchestra; introductory remarks, P. B. Cornwall; "Monastery Bells," orchestra; prayer, Rev. T. K. Noble; ballad, Miss Ellen Coursen; poem, Miss Clara Dolliver; "The Geyser March," orchestra; oration, Hon. W. W. Morrow; prelude and "Star Spangled Banner," Miss Ellen Coursen; grand tableau of mechanical arts.

Mr. Morrow's address we will give next week, the pressure on our columns not affording space in this number. We append, however, the address of President Cornwall, which was as follows:

I do not propose to occupy more than five minutes of your time in complying with the custom which requires the President of the Mechanics' Institute at the opening of each of its industrial exhibitions to present a few brief remarks pertinent to the occasion. I will begin by saying that the chief objects for the accomplishment of which the Institute was founded, were:

To establish and maintain a permanent and circulating library of useful and valuable books.

To inaugurate and support lectures, and classes for instruction in mechanics and the sciences.

And to hold from time to time fairs or industrial exhibitions, not like the fairs of some parts of Europe, as places for barter and sale, but to enable those who have acquired particular skill and excellence in old methods, and those who have invented new machines or methods of construction or manipulation, to exhibit and compare their achievements that committees of experts may award prizes to those who have made the greatest progress; and, particularly, by exhibition, examination and competition to encourage and promote continued progress toward the greatest excellence in mechanics and manufactured articles, and to extend and increase the information of the general public on these and kindred subjects.

It is 26 years since the Mechanics' Institute was organized, and 24 years since its first fair was held, on the ground now occupied by the "Lick House," on the corner of Sutter and Montgomery streets, which was then on the outer edge of the city, in the sand hills, beyond the limit of paved streets and sidewalks.

The superficial floor space of the first fair building was 20,000 ft.—that of the present building is 190,700 ft., being more than 9½ times greater than the first, and it may be fairly said that the increase in numbers, variety, usefulness and excellence of articles exhibited from San Francisco manufactories, is in greater proportion than the increase of space for exhibition.

The growth and enterprise of the Institute, with its library, its lectures, and its industrial fairs, has been fully up with the growth and progress of the city.

Its exhibitions are self-supporting, and besides their mechanical and educational advantages, they supply an agreeable and much needed center for social promenade, with excellent music, extensive art galleries and beautiful pictures.

By actual count, over 390,000 persons have passed in at the doors during a single fair, and it is believed that the 15 fairs, which have been held, have each brought to the city from other parts of the State at least 12,000 persons, who have expended an average of $10 each at stores and hotels, making a total sum of $1,800,000 thus put in circulation here within the past 24 years.

The library of the Institute, containing over 30,000 volumes, principally of rare and valuable books, is constantly replenished with *current new* publications on all subjects.

The Mechanics' Institute is the only association in this city or State that provides every year a course of free public lectures on literary, scientific, mechanical and historical subjects by able scholars.

Finally, it is a live self-supporting institution. Its membership is so cheap as not to be a burden to anyone. Its members are men and women of the scholarly, professional, mercantile, mechanical and laboring classes; but are most largely composed of the great reading, thinking, working middle class, who plan and build, who mine, forge, hammer and rivet, in times of peace, and are of such as, when the occasion comes, in times of peril, shoulder the musket or draw the sword in their country's defense; some of them have experienced the privations, hardship and weary marches of tedious campaigns—have honorably fought in bloody battles of awful war, and are now most peaceful but earnest workers for our Mechanics' Institute, and the good it is trying to accomplish. We invite you all to become members of the Institute.

THE San Francisco Cordage Works, of this city, celebrated the other day the 25th anniversary of the organization of the works. All the employees were given a holiday on "full time." The proprietors entertained all those who had been with them since the establishment of the rope-walk, at Sausalito, where the steward of the San Francisco Yacht Club prepared them a chowder. All hands returned to the city on the yacht *Lolita*. It is seldom in this country that one hears of works keeping 15 or 20 hands for 25 years consecutively.

News in Brief.

THERE is a strike among butchers in New York.

AMADOR county's assessment role foots up $2,924,119.

POPULATION of Los Angeles county, 33,379.

TAXABLE property of Plumas county foots up $2,194,210.

TWO million sacks of wheat will be harvested in Colusa this season.

THE news is again received that Carl Schurz will succeed White as Minister to Berlin.

THE authorities at Berlin are trying to find the author of the threatening letter addressed to Bismarck.

AT Boston the Grand Trunk railroad is making—$82,000 in double eagles, $2,250,000 in standard dollars, and the remainder in subsidiary coin.

CLARE Sewall Read, the English agricultural author, thinks the outlook for a good harvest is not favorable.

CENSUS returns show that the population of the Dominion is 4,350,933, an increase of 680,498 in the past 10 years.

A TERRIBLE explosion has occurred in a mine at Lonrches, Department of Nord, France. Ten persons were killed and 20 badly injured.

THE coinage during July aggregated $3,896,- ing time contracts on westward bound freights, at low rates, extending into the winter months.

THE French Chambers of Deputies, in spite of the government only desiring a partial sale, has passed a bill for the sale of all the crown diamonds.

THE Emperor of Germany has conferred upon Prof. William Dwight Whitely, of Massachusetts, the Order of Merit, made vacant by the death of Thomas Carlyle.

POPULATION of Solano county, 18,475; of Benicia, 2,794; of Rio Vista, 666; of Vallejo, 5,987; of Suisun and Fairfield which are contiguous, 978; of Dixon, 876.

THE citizens of San Luis Rey, San Diego county, will celebrate the 100th anniversary of San Luis Rey Mission, beginning on the 25th of August next, and continuing for four days.

THE R. R. Co's. steamer, *Modoc*, ran ashore the other day on the Two Brothers, at the entrance of San Pablo bay. She was so much injured that she had to be docked for repairs.

IT is estimated that the bullion and matter output of the Summit Valley district, Montana, for the year 1881 will be at least $3,000,000, and that for 1882 it will be fully twice that amount.

SAYS the San Diego *Union:* It is a coincidence worthy of note that the first locomotive and the first steam printing press, ever seen on the Bay of San Diego, were "fired up" on the same day.

GOVERNOR CRITTENDON, of Missouri, offers $5,000 for the arrest and conviction of each participant in the robberies or murders at Glendale and Winston, and for the arrest of Frank or Jesse James $5,000 each extra is offered.

THE Ministerial Union of San Francisco has adopted a resolution of thanks to D. O. Mills, for his donation of $75,000 to the State University, for the foundation of a Chair of Mental and Moral Philosophy and Civil Polity.

RELIABLE information from Bowie station, Arizona, has it that the mysterious death of five men, a few days ago, was due to poison. It is hinted that it was the result of a conspiracy to secure certain mining interests owned by the victims.

IT is announced that the plot for the assassination of the Czar has been discovered and frustrated by the police. A lady of high family was chosen as assassin. Her accomplices have been arrested, but she herself escaped. The Czar and family left Moscow secretly on Sunday for Novgorod.

GEN. CROOK, commander of the Department of the Platte, has had added to his jurisdiction the care and territory of the Utes, Uintahs, White River and Uncompahgre Indians, who are being removed from Colorado to a new reservation in eastern Utah, near the junction of the White and Grand rivers.

TWENTY-FIVE ships and barks, composing fully two-thirds of the grain fleet, arrived in port between Friday and Tuesday. The nationalities of these vessels is as follows: British, 16; American, 6; German, 1; Norwegian, 1, and French, 1. Part of the varieties of cargoes brought by these vessels was 30,000 tons of coal.

THE steam sawmill owned by B. F. Way, about 20 miles east of Sonora, was entirely destroyed by fire last week. The mill, dwelling house, seven cabins and from 1,300,000 to 1,500,- 000 ft. of sawed lumber belonging to S. S. Bradford was entirely destroyed. The loss will amount to $25,000, upon which there is no insurance.

THE New York *Sun* says: Just why the Chinese government has seen fit to recall its young men, who have been studying in this country, is not yet clear, but that they are to continue their studies in England, France and Germany is denied by Kwong Ki Chin, the Educational Commissioner at Hartford.

THE recent scare among the settlers at Bruneau valley, Idaho, was occasioned by a portion of Panwick's band of Piutes, who are ranging through the Juniper mountains, where they go every year to fish, hunt and gather berries. These Indians were seen by stockmen, who supposed them to be hostile. The Indians are perfectly harmless.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. F. OSBORNE—San Francisco.
O. W. MCCREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—Napa, Nevada and Placer counties.
OZRO H. HOPKINS—Amador county.
A. LEONARD MEYER—Utah and Idaho Ter.
O. E. WETMORE—Alameda county.
J. M. WOLFE—California.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired), be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We will send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

THE State Mining Bureau, No. 313 Pine street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry O. Hanks, State Mineralogist.

COPP'S "U. S. MINERAL LANDS, LAWS, FORMS, INSTRUCTIONS AND DECISIONS."—1881. 570 pp. In full law binding, $4.50; half law binding, $3, at this office.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Co.,

SAN FRANCISCO, August 2, 1881.

At a meeting of the Board of Directors of the above-named company, held this day, Dividend No. 31, of Seventy-five Cents (75c.) per share, was declared payable on FRIDAY, August 12, 1881, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Secretary.

Office—Room No 20, Nevada Block, No. 309 Montgomery St, San Francisco, Cal.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending this date, the Board of Directors of The German Savings and Loan Society has declared a dividend on Term Deposits at the rate of five and one-tenth (5 1-10) per cent per annum, and on ordinary Deposits at the rate of four and one-fourth (4) per cent. per annum, free from Federal Taxes, and payable on and after the 11th day July, 1881. By order, GEO. LETTE, Secretary.

San Francisco, June 30, 1881.

ASSESSMENT NOTICE.

Consolidated Pacific Mining Company.

ASSESSMENT, NO. 3.

Amount	Forty Cents per Share
Levied	July 9, 1881
Delinquent	August 12, 1881
Day of Sale	September 1, 1881

F. E. LUTY, Secretary.

Office—Room 5, No. 330 Pine St., San Francisco, Cal.

Arizona Mexican Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Globe District, Arizona Territory.

NOTICE.—There are delinquent upon the following described stock, on account of assessment No. 1, levied on the Seventh (7th) day of June, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amount
O R Johnson	180	49900	$24,050 00
O R Johnson, trustee	146	1000	500 00
O R Johnson, trustee	147	1000	500 00
O R Johnson, trustee	148	1000	500 00
O R Johnson, trustee	149	1000	500 00
O R Johnson, trustee	150	1000	500 00
O R Johnson, trustee	151	1000	500 00
O R Johnson, trustee	152	1000	500 00
O R John on, trustee	153	1000	500 00
O R Johnson, trustee	154	1000	500 00
O R Johnson, trustee	155	1000	500 00
O R Johnson, trustee	156	500	250 00
O R Johnson, trustee	157	500	250 00
O R Johnson, trustee	158	500	250 00
O R Johnson, trustee	159	500	250 00
O R Johnson, trustee	160	500	250 00
O R Johnson, trustee	101	500	250 00
O R Johnson, trustee	162	500	250 00
O R Johnson, trustee	163	500	250 00
O R Johnson, trustee	164	500	250 00
O R Johnson, trustee	165	500	250 00
O R Johnson, trustee	166	500	250 00
O R Johnson, trustee	107	500	250 00
O R Johnson, trustee	168	500	250 00
O R Johnson, trustee	109	500	250 00
O R Johnson, trustee	170	500	250 00

Name.	No. Certificate.	No. Shares.	Amount
O R Johnson, trustee	171	500	250 00
O R Johnson, trustee	172	500	250 00
O R Johnson, trustee	173	500	250 00
O R Johnson, trustee	174	500	250 00
O R Johnson, trustee	175	500	250 00
O R Johnson, trustee	176	500	250 00
O R Johnson, trustee	177	500	250 00
Geo R Adams, trustee	12	500	250 00
Geo R Adams, trustee	13	500	250 00
Geo R Adams, trustee	14	500	250 00
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Geo R Adams, trustee	129	50	25 00
Geo R Adams, trustee	130	50	25 00
Geo R Adams, trustee	131	50	25 00
Geo R Adams, trustee	132	50	25 00
Geo R Adams, trustee	133	50	25 00
Geo R Adams, trustee	134	50	25 00
Geo R Adams, trustee	135	50	25 00
Geo R Adams, trustee	137	50	25 00
Geo R Adams, trustee	138	50	25 00
Geo R Adams, trustee	139	50	25 00
Geo R Adams, trustee	140	50	25 00
Geo R Adams, trustee	179	4000	2000 00
Geo R Adams, trustee	183	16650	8325 00

And in accordance with law, and an order of the Board of Directors made on the seventh (7th) day of June, 1881, so many shares of each parcel of such stock as may be necessary will be sold at Public Auction, at the office of the Company, room 30, No. 320 Sansome street, on Monday, the eighth (8th) day of August, 1881, at the hour of 12½ o'clock P. M., of said day, to pay said delinquent assessments thereon, together with costs of advertising and expenses of the sale.

GEO. R. ADAMS, Secretary.

Office—Room 30, No. 320 Sansome street, San Francisco, Cal.

Steep Hollow Gold Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Liberty Hill Mining District, Nevada County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 6) levied on the 21st day of June, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. shares.	Amt.
Jos. Clark	3	50	$75 00
E. A. Richardson, Trustee	25	100	150 00
E. A. Richardson, Trustee	26	100	150 00
E. A. Richardson, Trustee	27	50	75 00
E. E. Dewey, Trustee	50	500	750 00
J. W. Pew, Trustee	55	2250	3375 00

And in accordance with law, and an order of the Board of Directors, made on the 21st day of June, 1881, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the auction rooms of Jno. Middleton & Son, No. 116 Montgomery street, San Francisco, California, on Thursday, the 18th day of August, 1881, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

J. W. PEW, Secretary.

Office, 310 Pine street, room 16, San Francisco, Cal.

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Hot Sulphur Water for Rheumatism, Paralysis, etc.; Cold Sulphurs for Diseases of the Bowels and Stomach; Climate Beautiful; Scenery Magnificent; Abundance of Trout Fishing; Good Cooking. Board, $10 to $12 per week.

ANDERSON & PATRIQUIN, Proprietors.

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H. S. GREELEY, PROPRIETOR.

Sanderson Bros. & Co.'s

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WARRANTED MOST SUPERIOR FOR DRILLS, HAMMERS ETC.

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PASSENGER CARS,
STREET CARS,
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CAR WHEELS, from A. Whitney & Sons.

RAILROAD IRON,
SPIKES, BOLTS, Etc.
} FROM BEST EASTERN MAKERS.

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202 Market Street, San Francisco

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Mechanics' Mills, corner Mission and Fremont street.

Certificate of Partnership.

We certify that we constitute a partnership transacting business as manufacturers and dealers in patent water closets and other sanitary goods, in the State of California. Its principal place of business is San Francisco, California; its name is Milne & Gants; the full names and respective places of residence of all its members are signed hereto.

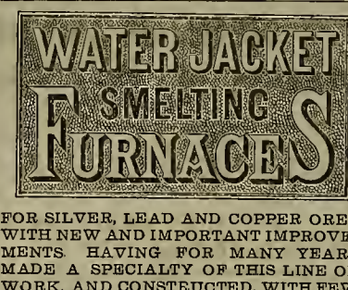
Dated, San Francisco, July 9th, 1881.

GEO. MILNE, residing at San Francisco Cal.

WM. H. GANTS, residing at Oakland, Alameda County, California.

Duly acknowledged, July 9th, 1881, before W. H. Barton, Notary Public, in and for the City and County of San Francisco, and filed in the County Clerk's office of the City and County of San Francisco, July 9th, 1881. Endorsed: Filed July 9th, 1881. WILLIAM A. STUART, Clerk,

By JOHN H. MOTT, Deputy Clerk.



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MANUFACTURER OF

Also Water-Proof Leather Belting.

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Certificate of Partnership.

We certify that we constitute a partnership transacting the Printing and Publishing Business, in the city and county of San Francisco, State of California, under the name and style of George Spaulding & Co. That the names in full of all the members of such partnership and their respective places of residence, are as follows: George Spaulding of San Francisco, Dwight Germain of San Francisco.

In witness whereof we have hereunto set our hands this First Day of April, A. D. 1881.

GEORGE SPAULDING,
DWIGHT GERMAIN.

Duly acknowledged, June, 4th, A. D. 1881, before Sam'l S. Murfey, Notary Public.

Endorsed—Filed May 8, 1881.

WILLIAM A. STUART, County Clerk.

By JOHN H. MOTT, Deputy Clerk.

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ALBANY COMPOUND,
CYLINDER AND SPINDLE OILS.
All others are Counterfeit.
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CYLINDER AND COMPOUND CUPS.
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Lubricating and Lard Oils.

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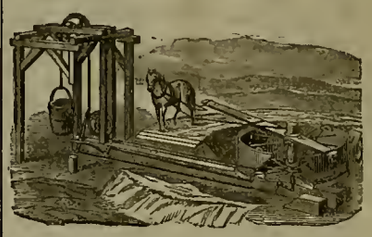

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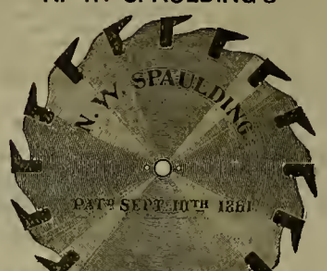

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All kinds of Light Iron and Wood Work, including Patterns, Gear Cutting, Planing, Engine, Musical Instruments and other repairing. Dies Taps, Reamers, etc., a specialty. HEALD & BANKS, Proprietors.

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ROOT, NEILSON & CO.,
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Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.
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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. PRICES MODERATE.
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Each grade superior to like numbers of any other Nitro-Glycerine Powder in the market.
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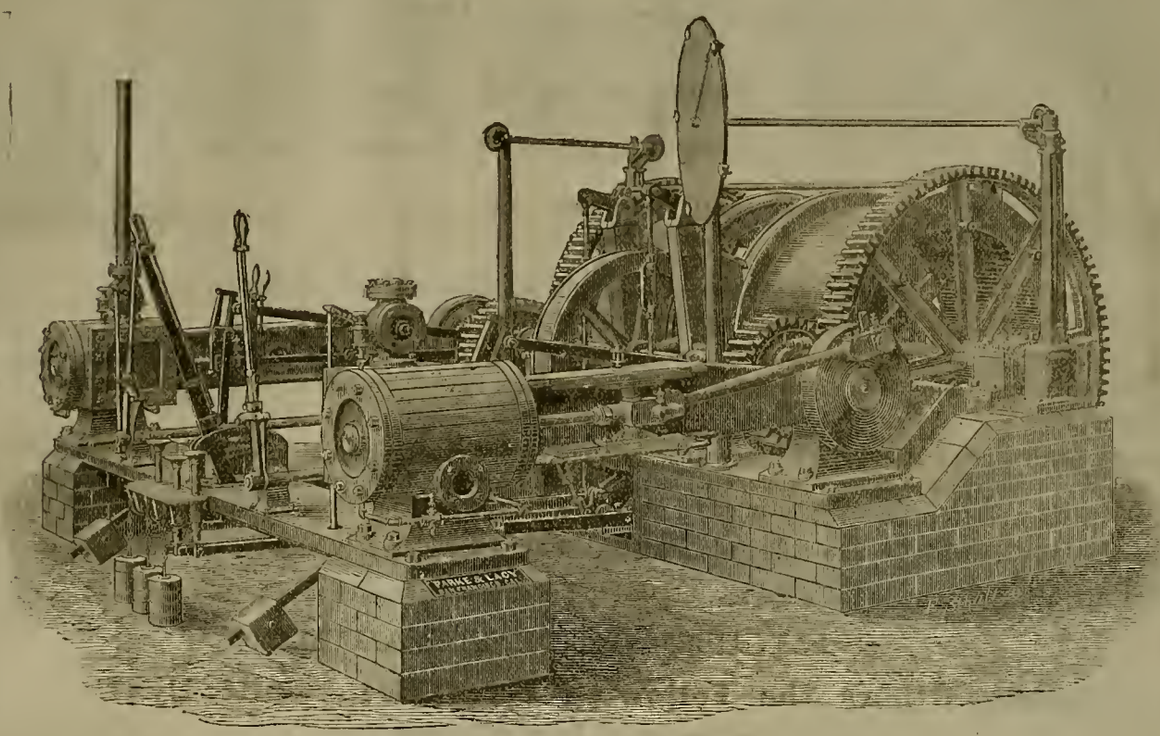

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Give this Powder a trial and you will use no other. For Strength and freedom from noxious fumes, it has no equal. Address all orders to EXCELSIOR POWDER CO., No. 330 Pine Street, Rooms 53 and 54, Academy Building, San Francisco, Cal.

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WORKING PLACER, GRAVEL AND QUARTZ MINES,

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OLD MINING PLATES BOUGHT, TAKEN IN EXCHANGE FOR NEW, OR RE-PLATED.

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Philadelphia Chemical Stoneware Manufactory,

1100 E Cumberland St., Philadelphia, Pa.

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WIND MILL. One of the best made in this State for sale cheap on easy terms. Address, W. T., care of Dewey & Co., S. F.

FULTON IRON WORKS,

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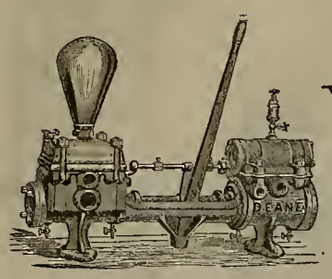

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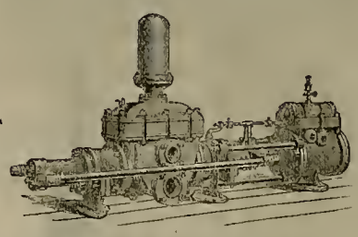

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MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO, SATURDAY, AUGUST 13, 1881.

VOLUME XLII Number 7.

A New Form of Girder.

Experiments at the Rolling Mills with Jackson's Cast-Iron Girder.

Some interesting experiments were conducted the other day at the Pacific Rolling Mills, with a new form of cast-iron girder, the invention of P. H. Jackson, late Chief of the Bureau of Iron Construction, Department of Buildings, in New York. The experiment was really one on a mode of using cast iron when subject to transverse strain, by which its whole cross section is compressively employed without taxing its comparatively feeble resistance. Before describing the girder, it may be well to bring forward for consideration some points on girders generally.

Cast iron possesses the enormous compressive resistance of 93,000 lbs. to the square inch, while its tensile strength is but from 14,000 to 15,000 lbs. The ratio computed by Mr. Hodgkinson is about 6½ to 1.

The object attained in this construction is a perfect girder. When employed the bottom or tie rod is tention, and the arch is in compression in every part with no tensile strain whatever; the latter an object not before attained. The antagonistic force of compression to resist the tensile strain of the tie rod is exerted at the bottom or intrados of the arch, and this force is increased in the ratio of the increment of the load on the arch. The remaining part of the arch above the bottom is naturally compression due to the load. A summary of the peculiarity of this arch is as follows:

It is in effect a device for employing cast iron compressively, neutralizing the tensile strain due to transverse strain. The tensile strain on the tie rods is reciprocally utilized in compressive resistance at the intrados of the arch, thus destroying tensile strain in every part of its cross section. Another advantage in construction of a metallic girder made in sections of its lengths is, that should the tensile strain at the intrados of the arch, exceed that of compression by the action of the tie rods, the deflection of the arch is limited to the length of a bay only. For instance, in a girder 150 ft. in length, made in 10 bays, each 15 ft. long, the deflection that would injure the strength of the material of the arch is limited to the length of a bay of 15 ft., instead, as in other constructions, its weakness, by deflection, would extend over its whole length.

The neutral axis of this girder exists between the tie rod and the bottom or intrados of the arch, or midway between the antagonistic forces. With the segmental arch in one piece and the tie rod to resist the neutral axis, is near the bottom of the arch, and travels upward as the load is increased; as the neutral axis will exist wherever the two opposite forces cease to exist, being indifferent to either force. The economy in the use of this neglected material, cast iron, for long spans when subject to cross strain, is in the employment by which its tensile strength is not called into play; also another grave objection is by an unequal distribution of the metal, causing weakness in the casting when forming from the molten to the solid state, and from that condition until cold. The heavy parts in contraction, control the thin or weaker parts, or if the formation of the mold is such that the ends of a long casting set deep in it and offer a resistance to the contraction of the metal when forming from a liquid to a solid state both of these adherent weaknesses continue and increase until cold. These weaknesses are entirely due to separation or taxing its comparatively feeble tensile strength, and not in the least injuring it in its compressive resistance, as cast iron is never in a contracted state other than cold; and as long as cast iron is used compressively, it makes no difference how many pieces it may be in of its length, providing its abutting parts squarely or equally meet and are kept in line. Take, for instance, the area of the abutting parts of the 25-ft. girder shown in the engraving or the cross section of the bottom flange in the center of a bay, which is 16 inches wide by 1⅛ inches thick, which equals 18 inches.

Eighteen inches multiplied by 93,000 lbs. to the inch equals 1,674,000 lbs., or 744 tons; taking it at one-fourth when employed, we have the resistance of 186 tons as a safe employed load. The area of the tie rods to resist this compression at 8 tons working strain per inch, providing the arch has suitable rise, would be 23¼ inches, or more than 3 of 3 inches diameter rods. Tie rods are cheap—merely bars of wrought iron with threads and nuts. When a railroad train enters on a bridge borne by these girders, the opposite end to the train is prevented from raising by the abutting parts on the bottom of the arch compressively exerted. There is no part of the arch in which tensile strength is employed.

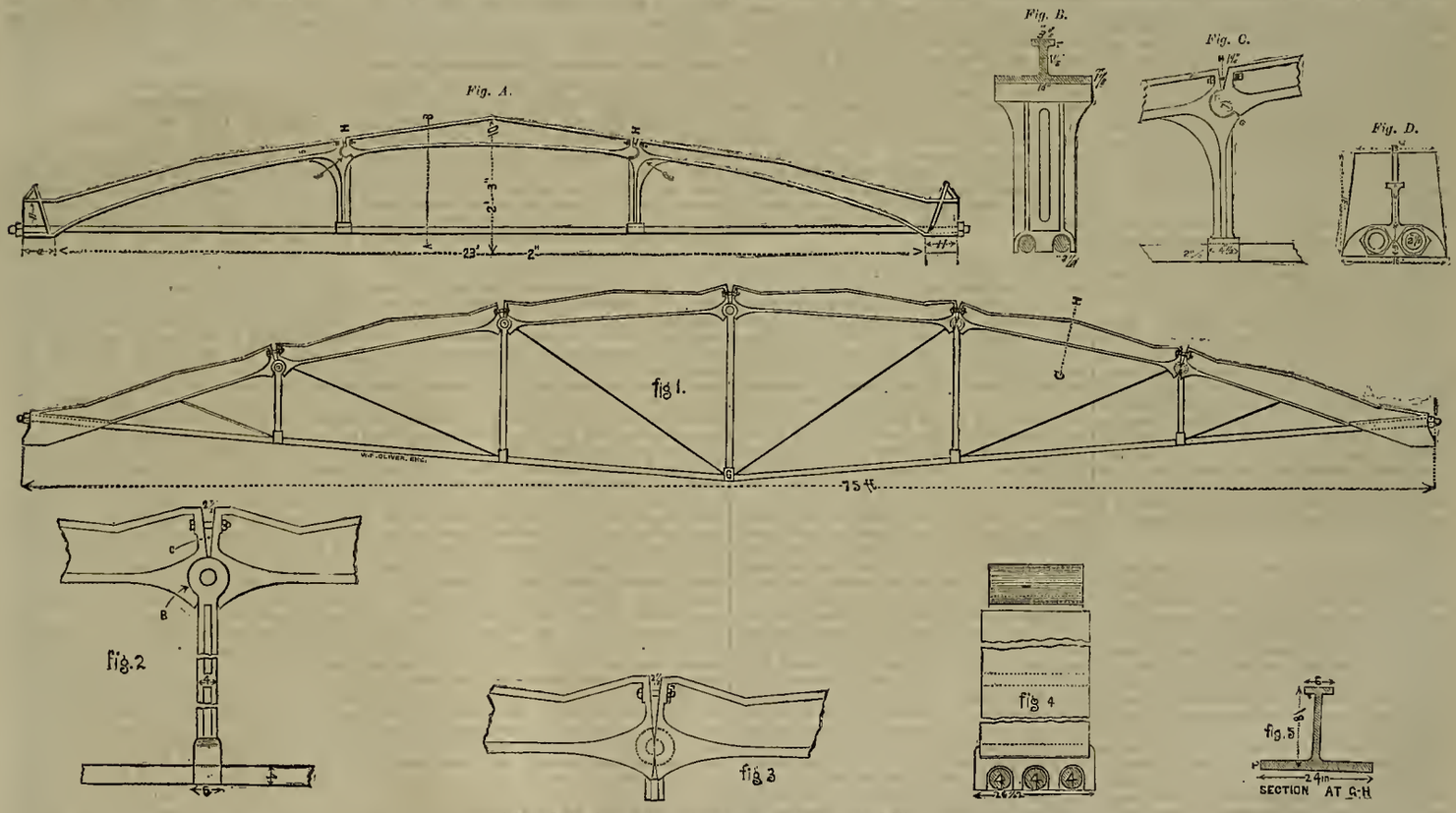
The object of this device was to construct a perfect girder, the whole arch resisting compression, the tensile strain necessarily exerted by the ties, and using this essential resistance to render indifferent a most destructive force to cast iron, viz: The tensile strain due to cross strain, showing an economy in this mutual antagonism, an equilibrium and forces negatived.

The inventor has endeavored to make a continuous arch embodying the principle of the Voussoir arch. Mr. Jackson's is a sectional, continuous arch employed compressively over its entire cross section.

A Voussoir arch is composed of many blocks to make up its length, and without the use of cement or mortar between the blocks. With the exception of friction of the blocks as they slide downward, taking a more compressed position as the load upon them is increased or the abutments yield, there is no tensile strain whatever, upon them, and the calculation has only to be made as to the strength of the material in its compressive resistance. With a continuous segmental arch, made in one piece of its length, there is, at every point, a bending moment and a thrust force; therefore, a continuous arch brings into play both compression and extension as that of a straight girder, but with more of compression than extension. See page 9 of W. Airy's book on iron arches.

With an iron arch in one piece of its length, the wrought iron tie rods elongate in the ratio of 1-1000 of its length to every 10 tons tensile strain per square inch of cross section, and this elongation is considered the measure of the elastic force of the metal.

At this strain the elongation would be for a 25-ft. girder same as shown in the drawings, 3-10 of an inch. 25 ft. equals 300-1000 inches, equals 3-10 of an inch. At this elongation of the rods, be the material of the arch either of cast or wrought iron, the arch loaded will have so far straightened as to cause great tensile strain at the bottom, giving free play to



DETAILS OF NEW FORM OF IRON GIRDER.

(Continued on Page 105.)

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

The Hydraulic Mining Question.

A Candid Review of the Subject.

Editors Press:—Having carefully read the letter of A. B. Paol, published in the *Bulletin* of the 23d ult., also the "rejoinder" by a citizen of Marysville, published on the 28th ult., and realizing the power and usefulness of the press in presenting different phases of important and vexed questions to the arbitration of public opinion, I ask a space in your columns for a few thoughts upon the subject matter discussed in said communications, and hope that a mutual interchange of opinions between the parties in interest may result in a final solution of the questions involved in accordance with equity and justice.

"A citizen of Marysville" starts out by asking the privilege of stating a few "facts" in reply to Mr. Paul. Let us examine a few of his self-named facts and see if they are anything more than assertions.

His first asserted "fact" is, "that if there are mines so situated that they must use the rivers and their tributary streams as a dump, or stop mining it is their misfortune." To place this assertion in the category of facts would seem to require a final decision of the questions at issue; should the decision be favorable to the miners, the fact would be that if there were farms so situated that they could not prevent an overflow of debris it was their misfortune.

His second asserted fact is "that the city of Marysville is not acting for itself alone, but for the whole surrounding country (a very large area), and is supported by every thinking man in the Sacramento valley" (a statement broad enough to match it). If this assertion has been so verified by the aforesaid citizen as to enable him to substantiate it as a fact, it must have cost him a large amount of time and labor; perhaps the conclusion was arrived at by a process common in many minds, who fancy that people differing from them do no thinking.

His third asserted fact is that "every man who comes here (Marysville), from the mines, sees that if the present flow of debris does not cease, the entire destruction of this section is inevitable." As he gives "this section" no bounds, the foundation for this "fact" is not clearly seen through the fog.

His fourth "fact" is, that "our people (of Marysville), are not devoid of human sympathy or callous to the interest of others." I am willing to accept it as a fact on trust, barring perhaps a few exceptions. ("Citizen" will please not consider this remark as personal).

His fifth asserted "fact" is, that Mr. Paul's assumptions, "hydraulic mining is not going to stop," and "valuable farms are not to be destroyed by recklessly dumping debris upon them," stand on a par with an assumption that the rain shall fall and the ground retain no moisture, and if verified by "Citizen," implies such an exhaustion of the subject matter as would take an educated engineer long time and great labor to arrive at. The conclusions of a corps of trained engineers, after a scientific exploration, would be more worthy of a place in a cabinet of facts than the crude assertions of an interested party, suffering perchance under a heated brain.

His sixth asserted "fact," is, "that as for the continuing of the present system of hydraulic mining and the use of the Sacramento valley for homes and cultivation it is an impossibility." Had he have limited his assertion to a portion of the valley would have been correct, but we fancy, as will be explained further on, that the stopping of the mines to-day and forever would not remove the danger in that direction, as far as the present generation is concerned. So much for his asserted facts.

His opinion that the comment of a London mining journal upon Judge Keyser's decision in the Keyes case comes from an unprejudiced source, will not be accepted as of much value, until something more is known of the unprejudiced condition of the writer's mind and his capability of forming an intelligent opinion from familiarity with the peculiar aspects of the case, law-like science must travel slowly and carefully in the investigation of new and difficult problems.

In estimating the gain or loss to the State of California and comparing the number of men supported by mining with those supported by farming, "A Citizen of Marysville" should include in the former industry nearly all the inhabitants of mining districts, and should also remember that a large portion of farm employees are semi-tramps, who huddle into the cities during the winter months and do not form so valuable a portion of the body politic as miners who have steady and constant employment (as do most hydraulic miners), the year round. That mining companies as he asserts (a pettifogging plea), hire Chinamen is true in many, doubtless in most if not all cases, so does nearly every one else from the veriest blatherskite that ever hurrahed for "Dinnis Karny" up, when they deem it for their pecuniary advantage.

His assertion that with hydraulic mining stopped the miner could fall back on quartz and drift mining looks a little cloudy, when we reflect that every quartz mill is a sand factory, and his whole argument is built upon sand and a sample was forwarded with it to the press.

His estimate that there has already been dumped into the Yuba river alone, debris enough to cover the entire Sacramento valley one foot in depth, we have not the data to prove or disprove, but assuming it to be a "fact," we can safely add for the Feather, Bear, American and other rivers and creeks, three ft. more. Now the bulk of this debris lies in the beds of the rivers and creeks, and it might be well not only for a "Citizen of Marysville," but for every other citizen, to look the matter squarely in the face and see if the horse is not out of the stable, the door of which the crusaders against hydraulic mining are in such a hurry to put under lock and key. Let "Citizen" come up into the mountains and we will show him some things about the action of water upon debris—will show him how an artificial river, a long sluice, when clogged, will remain so in spite of all attempts to clear it by working or filling in at its head, but go to the foot and remove a small portion and the debris will gradually run out; should you excavate a narrow channel through the center and then send through a gradually increasing stream of water like that sent by rain through the rivers, you would send it out with a rush; this it seems to me would probably be the action of the rivers should mining be stopped, the side streams coming in near the lowlands would free the lower portion of the steep grades and let the rest come gradually tumbling down, or the summer flow would cut narrow channels and the winter rains send it down in large masses to the valleys; for one, I believe the valleys would be safer by keeping up the surface drift to repair waste and keep the grade even and continuous. Take a river bar, work it from the head, and the unworked portion will remain intact for years, but commence at the lower end and the first high water is liable to clean it out as clean as a "Citizen of Marysville" would clean out a hydraulic miner. The mischief, as far as the valleys are concerned, is already accomplished; if you stop all mining to-day you cannot stop the rivers, and just as sure as water runs down hill will they, unless artificially prevented, send their present mining debris plus the annual wash from the mountain sides into the valleys. Would it not be better for the valleys and the mountains to work together in harmony and devise some way to save both their industries for the public good? All our valleys are results of debris washed from the mountains and hills; look at the artesian well in the court-house yard at Stockton, sunk through many hundred ft. of water-deposited matter without reaching bedrock. The miners are only hurrying up the work of Dame Nature, making the old lady do in a few years what it would take her many to do without a little spurring.

Now for a general view of the situation. I hold (by imagination), in my hand the little piece of gold that Mrs. Weaver boiled in lye to test its integrity; it started a ripple that spread from mountain to mountain and ocean to ocean over the world; the debris from which it was washed flowed down the river on its passage to the valleys below, and from that time the same process has been going on, gradually increasing in volume. Its acknowledged results are the peopling of the Pacific coast; the creation from three insignificant Territories of three active, prosperous States; the developing of more than that number of Territories to a condition in which they are becoming restive under the shells of incubation and trying to kick them away; the placing of our nation in the world's front rank as a producer of precious metals, and in the confirmed belief of many, carrying the Ship of State in safety over the rocks of secession, enabling it to keep the banner of a republican government floating at its mast-head.

These are some of its great results; among the minor ones are the making of many wealthy men from victims of poverty, and among them are many farmers, who, having purchased their farms from the profit and sale of mines in the mountains, would now say to the men who purchased them, you must stop mining or provide for it some new system, not quite so foolish perhaps as he who killed the goose that laid the golden egg, as they have taken the precaution to sell the goose before seeking its life, if the goose is in danger. In view of all the circumstances, it would seem as if the nation who sold her the ground to scratch on could well afford to pay the damage caused by the scratching.

There is an old maxim that "custom makes law," and it would seem that a system of mining practiced for over 30 years, ever since the "first specimen" was exhumed from its resting place, encouraged and fostered as it has been by the National and State Government and pointed to with pride by all classes throughout the nation, should cover the miners' business with something like the sanctity of law, and give them some rights that the public were bound to respect.

In answer to "A Citizen of Marysville's" "law of the case," I would remind him of the inherent right of every government to condemn private property for the public good, and should the State or National Government consider the mining interest of sufficient public importance to condemn the farming land injured thereby and levy a tax to pay for its value or for the damage done to it, they have an undoubted right to do so, but to ask the miner to abandon his property to save the farmer is asking a little too much. There has been neither fraud or deception practiced by the miners in the premises; the farmers have settled in the valleys with their eyes wide open, knowing the danger, if not knowing it was from inability or neglect to read a lesson spread in an open book before them.

To his bravado and plea for sympathy in his Grange programme, I would say that his remarks apply with equal force to the miners; both classes belong to the same race, and though the miners may crawl into more "holes" than the farmers, their experience there does not tend to make them more "submissive." Their wives, children and homes are as dear to them as are those of any other class to them, and they are in full as much danger of becoming reckless as would be a Granger if dealt with in a manner deemed unjust. But enough of this; palsied be the hand or the tongue that would stir up discord and dissension between the two parties whose interests are so interwoven together; far better be taxed to promote peace and good will than be hired to stir up contention and strife.

Hoping that all parties in interest will take counsel of reason and act together for their real interest instead of being led by the nose at the beck of brawling politicians, or giving their ear to scheming, impecunious lawyers, I remain by the grace of God and the Continental Congress,

A Hydraulic Miner.

Inter-Mercurial Planets.—No. 3.

A Probable Transit October 12 or 13, 1881.

Editor Press:—Lest some of your readers should suppose, after reading my letter No. 2 in your issue of July 16th, that the best interpretation I can give to Leverrier's 33.0225-day sidereal period hypothesis, and its relation to W. G. Wright's observance of transit, Oct. 24, 1876, and the ratio of displacement of node, makes the forthcoming transit fall due at 5 P. M., October 12th, at San Bernardino, I should like it to be clearly understood that the data gives a margin up to nearly 6 P. M., Oct. 13th. For example: 5 P. M., Oct. 12, 1881, was obtained by taking 50 apparent periods of 36.2825 days from Oct. 24, 2h., 0 P. M., 1876, assuming that as the middle of Wright's transit. The periods were obtained by dividing 6,422 even days from Lescarbault, March 26, 1859, to Wright, Oct. 24, 1876, by 177 periods. That was necessarily only approximate, therefore, that the main relation of Leverrier's hypothesis and Wright's observation should not not be lost sight of in the minutiæ of detail; but as the time approaches for instructing intending observers in various localities, where, if the transit is not clouded, it may be viewed with more or less advantage, it becomes necessary to explain the features that bear upon the inquiry more in detail. Of course, the Lescarbault-Wright interval was really days and fractions, not even days. For instance: Lescarbault's observance was probably about 35m. before the middle of his transit, which was only a small arc of the sun, 9′ 17″, instead of the full diameter, 32′, and took about 1½h. to make the arc. Lescarbault's first observation being at 4 P. M., when it had already commenced, the middle was, therefore, about 4:35 P. M., near Paris. Wright's observation was at 3 P. M., but the middle probably occurred about 1:30 P. M. in longitude 117½° west from Greenwich, or about 120° west from Paris, making 8 hours difference in time, which added to 1:30 P. M. makes 9:30 P. M. Paris mean time, so that there was 4h. 55m. fraction of a day in the interval more than 6,422 days. The interval, therefore, was about 6,422.2045455 days, which divided by 177 apparent periods, gives *exactly* 36.2836415 days each. Then taking 50 more such periods, it gives us Oct. 12th, 5h. 52m. 11s., in longitude 117½°, or say 6 P. M. in longitude 116°. But while the last known periods, up to Wright's observation, Oct. 24th, 1:30 P. M., 1876, may be indicative of present periods, approximately, we should probably be more correct in using Leverrier's principle of taking the mean of several periods, embracing a long interval. Although owing to inequalities in the revolutions, Leverrier's computation missed the exact date of Wright's observed transit, and consequently failed on March 22, 1877. In order to be successful, therefore, we must make all possible allowance for our margin, after seeing what the data itself gives.

We find that Leverrier—see *Nature*, October 26, 1876—based his computation on the whole interval from Jan. 1, 1750 (or 1750.0 as expressed), to Lescarbault, March 26, 1859, which we have considered must have been about 4h. 35m., P. M., Paris mean time. That interval was therefore 39,897 days, and .1909722 fractional, and required 1,099 periods of 36.3031765 each, and Leverrier probably took 176 such periods, or 6,389.36 days, to Sept. 21, 1876, when he made the conjunction one, and then five more to March 22, 1877, for the transit he thought due. The transit occurred, as we have shown, on Oct. 24, 1876, so that the Leverrier periods were too long for the Lescarbault interval; but if it was in reality the same planet, we should be justified in looking for a return to the mean periods of 1750–1859, at an early date, and perhaps during the present interval from Wright, Oct. 24, 1876. That presumption would make 50 periods of 36.3031765 days each, fall on Oct. 13, 5h., 18m. 43s. P. M. at San Bernardino, or in longitude 117½° W., which in round numbers, is 23½ hours later than the Lescarbault-Wright interval would denote the present periods would make. Both results are not very favorable for California, as the sun will have set, or nearly set before the middle of transit at San Bernardino. But if we examine the interval from De Cuppis to Lescarbault, or from Oct. 2, 1839, which was taken at noon, and therefore makes 7,115.1909722 days, we find that that gives 196 apparent periods of about 36.302 days each, and makes the time about 2h. earlier, or Oct. 13, 3h. 54m. P. M., in longitude 117½°. That would afford much better chances of the middle of the transit being observed on the Pacific coast; and give over 1½ hours before sunset at San Bernardino in long. 117½° W. lat. 34½° N. At New Orleans the middle would occur about 5h. 44m. P. M.. Chicago would miss the middle, for, being in latitude 41½°, sunset would occur half an hour before the middle, At San Francisco it would be due about 3h. 35m. P. M., or 1h. 50m. before sunset. The probabilities are certainly in favor of the return to approximate mean periods. So, while we may be justified in commencing observations even from sunrise, October 12, so as to leave no chances to see the commencement of the transit, it is quite possible it will not commence before 10 to 11 A. M., October 13th. In the event of the re-discovery it will at once confirm the Leverrier hypothesis and Wright's observations, Oct. 24, 1876, and, of course, be peculiarly gratifying to myself, having devoted considerable time to the inquiry. In either case the Pacific ocean, Honolulu, and even farther west, affords the only chances for seeing the whole of the transit, if of long duration. Sydney and Hong Kong and Japan are still better. I am glad to add that Charles F. Crocker, Esq., Vice-President of the Occidental and Oriental Steamship Co., has given instructions to his officers, to take such observations as are practicable on the ocean, according to my recommendations; and I trust that the Pacific Mail Steamship Co. will do likewise. The Royal Mail Steamship Co. may also render some service, as their ships will have the advantage of later sunsets than San Francisco or San Bernardino, as regards latitude. The Navies of all nations which have received instructions about the transit of Mercury, Nov. 7, 1881, might also render good service October 12th and 13th, regarding Vulcan. I have written and expect shortly to hear from Washington.

Very Respectfully,

A. F. Goddard.

Sacramento, August 6, 1881.

Mexican Duty on Machinery.

The Tucson *Daily Star* of July 29th, has the following very applicable remarks on the subject: "It has several times been announced that an effort is being made to have the Mexican Congress pass a law imposing a duty on American mining machinery. This agitation has its source with the large foreign element throughout the Mexican Republic, and is designed to discourage not only American emigration but American machinery. Mexico could not pass a law which would produce more suicidal results to her fast advancing prosperity, and at the same time cementing that friendly feeling between the two republics which should be fostered at any cost.

Mexico has her mines of gold, silver and copper, the United States has the capital and the mechanics to manufacture the machinery necessary to develop her great wealth. There should be a reciprocity of trade as well as reciprocity of friendship between the two republics on this American continent, and in everything there should be co-operation. No foreign power will ever be allowed to molest or interfere with our sister republic as long as the Government of Washington is perpetuated on our soil. Then why should our neighbor take counsel with foreigners whose form of government is diametrically opposed to theirs? Why then listen to words which tend to sow bad feeling between governments which are republican in form and spirit? We would like to see free trade in the broadest sense of the term between the United States and Mexico as fully as now exists between the several States of the American Union. Such a system would bring about the grandest results in the development of the prolific wealth of both countries. The advantages would be mutual to both people. We look forward to the day when free trade will be declared by both governments. It is to be hoped that our Mexican neighbors will set their hearts against the attempted foreign interference with that which is the very bone and sinew of the monetary success of the Mexican Republic.

Wood River's First Smelter.—The Wood River Smelting Company started up their furnace, near this city, at 11 o'clock last Monday night. At 3 o'clock Tuesday morning it was charged; three hours afterward the first bar of bullion was made, and by 7 o'clock last night, 43 bars were stacked up outside the works. Since then the output has averaged five bars per hour. The bullion is of a much higher grade than that of the first run. The ores run through are from the Star mine, two miles south of this city, the Fearnaught, about a mile west of here, the Carrie Leonard, in the Smokey district, and the Elkhorn, near Ketchum. About 350 tons are on hand at the smelter, and a supply sufficient to keep the smelter going is contracted for. The same is the case with the fluxes and charcoal. Of the latter alone over 100,000 bushels are contracted for. A car load of new bullion will be shipped to-morrow or Friday, and other car loads will follow in quick succession.—*Wood River Times.*

MECHANICAL PROGRESS.

New Applications of Electricity.

There can be no mistaking the evidences which are everywhere multiplying, that electricity is soon to become a most important factor in nearly all industrial enterprises. The latest announcement of the practicability of storing electric energy in large quantities, for any length of time, and carrying it to any distance opens quite a new and wide field of research, which will doubtless be worked with all the energy and skill which is so characteristic of the present time, and the present generation of thinking workers.

It is now stated that the electric railway, which was recently opened with much ceremony and *eclat* at Berlin, has proved so satisfactory that a second is projected for another portion of that city. The cost of construction is comparatively small, it is only about $60,000 per mile, which is not considered large considering the advantages it possesses over horses or steam for suburban travel.

And now we have the announcement of the practical application of this agent for brake service upon railroads. The Cincinnati *Commercial* of a late date, says that an electro-magnetic brake has been successfully applied to a train of cars on one of the railroads leading out of that city. The invention is by a Cincinnati man, and consists in an iron drum about 18 inches long and 9 inches wide, placed on one axle of each car. Inside of this drum is an iron spool wound with wire, and connections made through the train by wire, all of which is carefully insulated. Electricity is generated in a dynamo machine placed on the locomotive, and is carried back by the wires to the spools on the axles, which, becoming magnetic, attracts bars of iron to it in such a way as to cause the iron drum to revolve with the axle. This winds the chain of the brake around the drum, and sets the brake on the wheel. The amount of electricity for each drum is carefully regulated to about correspond with the power of an ordinary brakesman, the idea being simply to supply a magnetic brakeman, as one might say, instead of man power. The initial power is increased as many times as may be required by means of a peculiarly constructed differential wheel, the increase of power depending solely on the diameter of this wheel. A train, consisting of a locomotive tender and three freight cars, running at the rate of 18 to 20 miles an hour, was stopped repeatedly without difficulty by the application of the brake, without using any brake on the locomotive or tender.

The English *Journal of the Society of Arts*, as well as many other journals and writers seem to be impressed with the idea that we shall soon be able to practically convey power to a distance by electricity, and give it forth again when and where required, at a very small loss of the power originally employed. When that time comes, if it ever does come, we shall have the means of utilizing at convenient points, the almost endless powers of nature which are now utterly wasted in distant and desert places. All around England the sea ebbs and flows an average of about 15 ft., with a power which, under the proposed employment of electricity, might furnish as much power, and at a vastly cheaper cost, than is energized by all the hundreds of thousands of stationary steam engines in constant daily use in that busy hive of industry.

We have already been accustomed to calculations as to the enormous amount of power which might thus be turned to profitable account at a single point in our own country—at Niagara falls. With such possibilities in the early future, what may we not expect from a proper utilization of the vast reservoirs of snow and water which are annually deposited along the extended ridges of the Sierra Nevadas. If wires can be so trained as to bring down to the ocean at moderate cost, the mighty powers developed by our mountain rivers, who can depict the wealth that would flow into San Francisco through a utilization of that power for manufacturing industries? We have already, in these columns, shown the decided advance which has recently been made in the substitution of electricity for gas in the production of light.

Again, the *Journal of Arts*, already quoted, speaks, of the substitution of electricity for coal in another direction. That Journal says: "We by no means despair of hearing that it (coal) is no longer needed directly, even for these operations, (metallurgical), for it is beginning to appear that electricity is able to do that in the way of melting refractory materials which has hitherto been done by the expenditure of fuel.

It has been stated on good authority that a copper wire of only half an inch in diameter would suffice to transmit 26,000 horse-power, as developed by a water-wheel, losing only 20% in a distance of 300 miles. The prime cost of the conductor would not exceed $15 per horse-power, for the power actually delivered at the distant station. This is on the authority of Sir William Thompson, of Scotland, the most distinguished electrician in the world.

PROF. BAUSCHINGER has lately tested some iron taken from a chain bridge built in 1829, and found that after 50 years of service its strength and elasticity had not altered perceptibly from what they were reported to be at the time they were put into service.

ELECTRIC TRANSMISSION OF POWER.—When examined before the Select Committee of the House of Commons on Electric lighting, in May, 1879, Sir Wm. Thompson gave an estimate of the quantity of copper conductor that would be suitable for the economical transmission of power by electricity to any stated distance; and, taking Niagara as example, he pointed out that, under practically realizable conditions of intensity, a copper wire of half an inch diameter would suffice to take 26,250 horse-power from water-wheels driven by the fall and (losing only 20% on the way) to yield 21,000 horse-power at a distance of 300 British statute miles; the prime cost of the copper amounting to $300,000, or less than $15 per horse-power actually yielded at the distant station. This reference to Niagara as the natural and proper chief motor for the whole of the North American continent has caused the idea to be erroneously attributed to Sir William Thompson, who now himself hastens to correct this impression. He says that he values the allusion too much to let it pass without pointing out that the credit of originating the idea and teaching how it is to be practically realized by the electric transmission of energy is due to Mr. C. W. Siemens, who spoke first on the subject in his presidential address to the Iron and Steel Institute, in March, 1877. Sir William spoke on the subject in support of Mr. Siemens' views at the Institution of Civil Engineers a year later.

SUN POWER.—The *Echo* states it is not impossible that before our coal fields are exhausted, we shall have discovered some means of doing many things without that, at present, invaluable fuel—at least, in regions where the sun shines. We have previously given an account of M. Mouchot's solar engine, but that extraordinary method of utilizing the heat of the sun has been eclipsed by an improvement devised by M. Pifre. It is stated that the latter has gone so far as to utilize 80% of the available heat of the sun's rays at Paris, and has actually constructed an apparatus with which he pumped water to a hight of 10 ft. at the rate of over 20 gallons a minute. As in Monchot's solar engine, a reflector receives the light and concentrates it upon a boiler, in this case containing nearly 90 gallons of water, which, under a clear Paris sky, begins to boil in about 40 minutes, and in a few minutes longer has sufficient pressure to drive the engine working the pump. In the not distant future, then, tropical countries will be the places where motive power can be had for next to nothing.—*Journal of Applied Science.*

FRICTION.—A large portion of the friction of engines is the result of tight cylinder packing. In setting out packing it should be only tight enough to keep the steam from passing. It is best to do this job by degrees, setting out the rings a little, and then blocking the crosshead, and testing by allowing steam in the crank end of the cylinder. When no steam passes, the rings are tight enough. In cylinders that have run for some time it is impossible to make a piston tight without re-boring. Care should also be exercised in making a complete revolution of the engine by hand after setting out the rings, to see that the packing does not stick in any of the smaller portions of the cylinder. An engine that requires constant lubrications in the cylinder to prevent "squeaking" needs attention, as generally the rings will be found too tight, or the cylinder out of line.

SALT AS A LUBRICATOR.—When a wire rod of iron or of steel is immersed in a hot solution of common salt, allowed to remain long enough to bring the metal to the temperature of the brine and withdrawn, the surface of the rod is irregularly covered with deposits of crystals of salt. These crystals adhere to the rod with great firmness, in consequence, doubtless, of a thin film of ferric hydrate which is formed between them and the rod as the water dries off. The rod can now be reduced by successive passes through a die or draw-plate, without any abrasion of the die. The economical advantage of this novel lubrication of wire is at once apparent, and the principle involved in it is interesting.

NICKEL PLATING BY BOILING.—Dr. R Kaiser, of Germany, prepares a bath of pure granulated tin tartar and water, which he heats to the boiling point, and adds a small quantity of pure red-hot nickel oxide. A portion of the nickel is soon dissolved, as is shown by the green color assumed by the liquid which stands upon the grains of tin. If articles of copper or brass are plunged into the bath they become covered in a few minutes with a beautiful white, silvery metallic coating, which consists almost entirely of pure nickel. If a little carbonate of tartrate of cobalt is added to the bath, a bluish shade, either light or dark, may be given to the coating, which becomes very brilliant when it is properly polished with chalk or with dry sawdust.

LARGE STEAM ENGINES.—Monster steam engines seem to be one of the features of the day. The Centennial engine, in Machinery hall, Philadelphia, was considered a monster in size and power. It is rated at 500-horse power. They are now putting up a 2,000-horse power engine for the Providence Water Works. These are very large for stationary engines. But engines of much larger power have long been in use in ocean steamers. There are now several trans-Atlantic steamers which develop from 4,000 to 5,000-horse power; but the Mail Cunard steamer service will develop 10,000-horse power.

SCIENTIFIC PROGRESS.

A Phosphorus Microphone.

In his photophonic experiments, Prof. James Blyth, of Edinburgh, was led to construct a useful form of selenium cell by dovetailing two brass combs, having alternate teeth knocked out, and filling up the spaces between the interlocking teeth with the seleninm. A modification of this pattern is made by fastening a brass disk on wood, and sawing it across until it consists of radial sectors, which are afterward connected by selenium. While trying to use amorphous phosphorus in place of the latter substance, he found the phosphorus evolved a current which varied with the pressure on the phosphorus, and the idea occurred to him that a microphone could be made from it which would not generate its own electricity. He therefore took a shallow wooden box, having a brass bottom, and spread a layer of phosphorus upon it, a thin flexible brass lid covering the box and touching the phosphorus. Wires from a telephone were then connected to the metal top and bottom of the box, and on speaking into a mouthpiece directed to the thin brass cover, the words were distinctly reproduced. The varying pressure of the sound waves on the phosphorus established an undulating current, which, passing though the telephone, caused it to give out the original words. When a battery was included in the circuit, the sounds were remarkably clear and loud, and free from the grating which disturbs the carbon microphone. Prof. Blyth also finds that the cell, which is really a form of loose contact, operates as a receiver as well as a transmitter, and will of itself emit articulate sounds under the influence of the vocal current.—*Scientific American.*

DISCOVERY OF ANOTHER COMET.—Mr. J. M. Schaeberle, of Ann Arbor, Michigan, discovered, July 13th, a new comet, the third of 1881. In the telescope it showed a bright center and a clear though faint tail. It appeared in the northeast, in the constellation Auriga, not far from the point of appearance of the comet now passing out of sight. The new comet is rapidly increasing in brightness, and will continue to do so until about August 21st, when it promises to be quite conspicuous, certainly as a telescopic object. It will be nearest the earth about August 20th, a day or two after its perihelion passage, when it will be about 40,000,000 miles away. So far "the orbit presents no special resemblance to that of any known comet," the Harvard astronomers say, though Prof. Stone, of Cincinnati, thinks he finds in it a close resemblance to that of the great comet of 1337. It seems to be moving in a northerly direction. This comet will not go so far north as the recent one. We will be able to see it early in the evening in the west, and early in the morning in the east. It has something of a tail, which will grow more distinct. The comet is labeled "C," being the third comet discovered this year. The comet so recently visible near the polar star is comet "B."

"THE CRY OF TIN."—A faint sound is emitted by tin when it is bent. It has always been believed that this "cry of tin," as it has been called after the German, is peculiar to that metal. Mr. J. C. Douglas, however, finds that it is not really singular, and, being due to the crystalline structure of the tin, can be imitated with other metals of a crystalline formation. The reason why it is not generally observed with cast zinc or cast iron is that these metals break off short before they can be bent sufficiently to yield the sounds, while rolled zinc has its crystalline structure so far destroyed by the mill that it is not capable of uttering the cry when bent. If, however, a piece of rolled zinc be heated for a few minutes to a temperature somewhat below its melting point, the metal becomes much less tough, and its fracture decidedly crystalline. In this condition, it emits, on being bent, a cry like tin, but fainter. Cast zinc cannot be bent so readily; but if it be pinched between the teeth or with pliers, it emits the sound distinctly. The practical deduction from these experiments of Mr. Douglas is that if, as appears to be proved, the peculiar "cry" in question is due to the crystalline character of the metal, it may either alone, or in conjunction with the microphone, become an indicator of the crystalline texture of metal beams and of their fitness for a certain class of work.

CURIOUS PHENOMENA OF FLAMES.—Herr Holtz describes some curious phenomena of flames. For instance, two slender flames formed by unmixed gas issuing from fine apertures, unite fully if the burners are brought near each other and inclined a little; but on separating the burners, and again inclining the flames so as to meet, they only mix if the point of the one be brought to the foot of the other. The two bright luminous parts behave as if mutually repellent. When the flames are pressed together, so as to broaden, there is always a well-defined dark space between. The phenomena are perhaps (the author thinks) electric. Again, when two thin flames are crossed at a certain angle (25° to 30°), and about the middle, a peculiar red-glowing tube forms at the lower part of the oblique flame disk, being composed of carbon particles whirling circularly and spirally. The particles on one side whirl in an opposite direction to those on the other.

NO LIFE IN METEORITES.—An account is going the rounds of the papers to the effect that traces of organic life have been found in meteorites, and that hence the other members of the solar system are inhabited by living beings. It appears that Dr. Hahn has published an elaborate work, in which he claims to have recently completed a series of investigations upon some of the huge meteoric stones that fell from the skies in Hungary during the summer of 1866. Thin laminæ of these mysterious bodies, subjected to examination under a powerful microscope, have been found to contain coraline and spongeous formations, and to reveal unmistakable traces of the lower forms of vegetation. All the organisms, animal and vegetable, discovered by Dr. Hahn in the delicate stone shavings he has thus dealt with, indicate the condition of their parent world to be one of what is technically termed "primary formation." But the presence of water in that world is proven by the fact that the tiny petrified creatures revealed by the magic of the lens, one and all, belong to the so-called subaqueous classes of animals. They could not, therefore, have possibly existed in comets, at least if the assumption be correct that these are in a state of active combustion. The fact is, that this supposed discovery, about which such a pother has been raised, is no discovery at all, and the work of Dr. Hahn merely shows how utterly he has misconceived the character of the material which he has studied. The plates of his volume are beautiful, but they only serve to illustrate the mineralogical nature of the material. What he has supposed to represent coraline and spongiform organisms are in fact only concretionary forms which the common minerals of meteorites often take. These forms are well understood by mineralogists, have long since been described, and are to be seen in nearly all the stony meteorites. While we know that there are other worlds than ours, and while it is possible that they may support life in some form or other, there is, we believe, as yet no tangible evidence whatever that this is the case.

SUBSTITUTE FOR PLASTER OF PARIS.—German physicians and builders, after a series of practical tests, speak very highly of the properties of "tripolith," a substance manufactured to replace plaster of Paris for surgical operations, and for stucco plaster and other work in the building trades. It is manufactured by Messrs. Gebruder von Schenk, of Heidelberg, and is remarkable for the rapidity with which it sets, its lightness, strength and polish. It is said to resist the action of water very well. It is made of impure gypsum, three parts of which are ground together with one part of silicats of lime, niac parts of the mixture being ground together with ons part of coke. The material is then heated and stirred, without the addition of water, at a temperature of 248° F. As soon as the water of crystallization of the gypsum has been expelled, the temperature is raised to 500° F., the product being a gray powder. The color of the dry mass is silver gray, and besides setting in a pure state in four to five minutes, it can be made to harden after five to six hours by the addition of water in which some glue has been dissolved. By comparative test, it was found that after setting it took plaster of Paris 147 hours longer to dry than tripelith. The latter is also 14% to 16% lighter, an important advantage for surgical operations and for use in stucco work. After it has been given a coat of oil, it holds color very well. As it grows older, set tripolith becomes firmer. Tripolith is said to be 30% cheaper than plaster of Paris.

EFFECTS OF OPTICAL SLITS.—M. Treve has lately described some curious effects. Looking through a fine slit at a vertical object (a post or a mast, for instance), he finds the perception much more distinct when the slit is horizontal than when it is vertical. On the other hand, to distinguish horizontal lines more clearly, the slit must be held vertically. But if, in general, one look at a house or a landscape through a fine slit, it is found that the maximum of brightness of the horizon is when the slit is horizontal. This effect, it is said, is also produced with the solar and lunar disks; they are seen much more distinctly with the horizontal slit. M. Treve has reproduced the effect by photography, and the negatives taken with the horizontal slit were more distinct. The light appears to be propagated with more intensity through the latter than the former, the vertical bands of solar photographs showing well the interferences and passage of light through a vertical slit. Again, if a crose-slitted disk be held between the sun and white screen, the horizontal part of the cross on the screen is brighter than the vertical. The practical application of these experiments of M. Trevo to photography would appear to be the relation which they bear to the shape of the apertures of diaphragms and to instantaneous shutters. Is it a fact with regard to the latter, that the uncovering of the lens horizontally admits more light, and therefore produces a picture more quickly than a shutter which opens vertically? There may be no difference, but the point, at any rate, is worth deciding.—*Photographic News.*

WATER IN AN AMETHYST.—An Atlanta paper reports the recent finding, in Rabun county, Ga., of an amethyst bearing a drop of water or similar liquid in a cavity near the center of the stone. It is not an uncommon occurrence to find such water-filled cavities in crystals of quartz and other minerals, but this cavity in amethyst is said to be unique.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 21		Week Ending July 28		Week Ending Aug. 4.		Week Ending Aug. 11	
Alpha	3⅜	2½	3.35	3.60	3.90	3½	4.05	3⅜
Alta	4.20	3.85	4.65	4.10	4.15	3.90	4.05	3.90
Andes	1.55	1.30	1.55	1.40	1.45	1.30	1.45	1
Ablion	4.05	3.10	3.45	1.65	1½	1.40	2.10	1.55
Argenta	10c	5c	10c	....	5c	....	15c	....
Addenda	15c	10c	15c	10c	10c	5c	10c	5c
Belcher	3.15	2.70	3.15	2.80	3.10	2.80	3.10	2.85
Belmont	....	....	50c	....	....	....	....	....
Best & Belcher	10½	9	11½	....	9½	11½	9½	10½
Bullion	95c	60c	60c	50c	60c	45c	60c	45c
Bechtel	1.80	1½	1.80	1.70	1.45	1.20	1.45	1.30
Bel Isle	....	....	....	....	25c	....	20c	15c
Bodie	7	6½	7	6⅝	6⅝	6½	7½	7
Benton	1.05	75c	1.15	1	1	90c	95c	90c
Bulwer	3	2.80	2.60	2.70	2¾	2½	2½	....
Bostou	....	....	40c	....	40c	25c	30c	....
Black Hawk	15c	10c	10c	....	5c	....	10c	5c
Belvidere	....	....	....	....	....	....	45c	....
Booker	....	....	....	....	....	....	....	....
Caledonia	15c	....	20c	10c	15c	10c	40c	10c
California	80c	70c	60c	70c	90c	70c	1	90c
Challengo	90c	....	....	....	75c	....	95c	75c
Chollar	2.30	2.05	2½	2.15	2.20	2.10	2½	2.10
Confidence	3.85	3.30	3.95	3.60	3.70	....	4	3⅞
Con Imperial	15c	10c	15c	10c	15c	10c	15c	10c
Con Virginia	2.10	1.05	2.20	1.95	2.15	1½	2	1.85
Crown Point	2.15	1.95	2.15	2	2.05	1.80	2½	1.90
Columbus	....	....	....	....	....	....	....	....
Champion	25c	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	75c	50c
Concordia (Va)	25c	....	....	....	....	....	....	....
Con Pacific	60c	40c	30c	25c	25c	20c	40c	20c
Derbec	....	....	....	....	....	....	....	....
Day	2.40	1.90	2.45	2.15	22	2½	2.85	2½
E. Mt. Diablo	15c	....	15c	10c	15c	10c	16c	15c
Eureka Con	....	30½	31½	26½	28	25	25	27
Exchequer	1.15	95c	1.40	1.10	1.15	1.05	1.15	1.10
Endowment	....	....	....	....	....	....	....	....
Grand Prize	40c	35c	30c	25c	25c	15c	20c	15c
Golden Gate	2.80	2½	2.60	2½	....	....	2½	....
Goodshaw	35c	....	75c	40c	50c	40c	45c	40c
Gould & Curry	4.80	4.30	5½	4.80	5½	4½	5½	4.80
Hale & Norcross	3.45	3	3.45	3.15	3.20	2.95	3.10	2.95
Head Center	90c	....	85c	80c	95c	90c	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	10c	....	....	....	5c	....	....	....
Julia	45c	35c	40c	35c	40c	35c	30c	....
Justice	95c	85c	....	70c	85c	75c	85c	70c
Jackson	....	....	50c	....	50c	....	75c	50c
Jupiter	....	....	....	....	....	....	10c	....
Kentuck	2.65	2½	2½	....	2½	....	3	2½
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	25c	15c	25c	15c	20c	....	25c	15c
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2.70	....	2½	....	2	....	2	....
Martin White	30c	....	....	....	....	....	25c	....
McClinton	....	....	....	....	....	....	....	....
Mono	3½	3	3.05	3	2.70	2½	2½	2.30
Mexican	7⅝	6⅞	7½	7⅜	8¼	7½	6½	7⅝
Mt. Diablo	8¼	7½	7	5½	5½	....	....	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	70c	55c	70c	55c	1	75c	1	90c
New York	15c	....	5c	....	10c	5c	10c	5c
Northern Belle	18	17½	17	16½	15¾	12½	15	14
North Noonday	30c	20c	25c	10c	55c	50c	55c	50c
Navajo	80c	75c	1	80c	75c	....	75c	70c
Occidental	1.30	1.20	1.35	1.30	1.40	1.35	1.35	1.20
Ophir	5½	5½	5½	5½	5½	5	5½	5
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.35	1.05	1.40	1.15	1.30	1.05	1.20	1.10
Oro	80c	65c	80c	70c	85c	45c	65c	50c
Paris	....	....	15c	....	....	....	....	....
Potosi	2.70	2.35	2.90	2.60	2.80	2.45	2.65	2.45
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	3.05	2.40	2.85	2.55	2.80	2½	2½	2.40
Seg Belcher	8¾	....	7	....	....	....	5½	5
Sierra Nevada	9¾	8¼	9¾	9	9½	8¾	9¼	8¾
Silver Hill	20c	15c	20c	15c	15c	....	15c	10c
Silver King	21½	20	21½	21½	20½	20	20¾	20½
Succor	....	....	....	....	....	....	....	....
Summit	25c	....	....	....	30c	25c	25c	....
Scorpion	1.20	1.10	1.15	1.10	1.35	1.05	1.40	1¼
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	5c	....	5c	....	5c	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	40c	25c	40c	30c	40c	....	50c	40c
Tioga Con	40c	....	40c	35c	35c	....	25c	....
Tiptop	4.90	4.80	5½	4.95	5½	5½	5½	5½
Tuscarora	....	....	....	....	....	....	....	....
Union Con	10½	8¾	10½	9¼	9½	6½	10	9¾
Utah	8¾	8	7	8¼	8¾	7¾	8¾	8¼
Ward	....	....	....	....	....	....	2.40	....
Wales	1¼	1	1.05	1	1.10	1	1.10	50c
Yellow Jacket	4.65	4.15	4.70	4.30	4.55	4.05	5¼	4.40

Sales at S. F. Stock Exchange.

Thursday A.M., Aug. 11.

560	Alta	4@4.05	
245	Andes	1@1.05	
150	Sutro	1@1.05	
40	B & Belcher	10¾@10½	
100	Bullion	50c	
200	Benton	90@95c	
100	Belcher	2.95	
190	California	95@1	
335	Con Virginia	1.95@2	
40	Chollar	2.20	
350	Crown Point	2.05	
100	Con Imperial	15c	
200	Caledonia	35c	
300	Challenge	90c	
110	Confidence	4	
10	Exchequer	1.10	
320	Gould & Curry	5	
50	Golden Gate	2½	
440	Hale & Nor	3	
300	Justice	80c	
175	Julia	30c	
50	Lady Wash	25c	
75	Mexican	8½	
100	New York	5c	
133	Ophir	5½	
190	Overman	1.10@1.15	
45	Occidental	1.30	
40	Potosi	2.80	
215	Savage	2.45@2	
45	Sierra Nevada	8¾	
5	Seg Belcher	5	
50	Scorpion	1.35	
100	Sutro	15c	
80	Union	9¾@9¾	
20	Utah	8¾	
220	Yellow Jacket	4.90@4.95	

AFTERNOON SESSION.

150	Addenda	15c	
765	Alhion	2.35@2.40	
50	Boston	20c	
100	Bodie Tunnel	3½	
250	Bodie	7⅝@7¾	
500	Belding	10c	
250	Belle Isle	15c	
200	Black Hawk	5c	
90	C Pacific	60c	
1900	Columbus	10c	
300	Holmes	65@50c	
50	Manhattan	1¾	
60	Mt Diablo	6	
250	N Belle Is	45c	
10	Northern Belle	14¾	
600	Navajo	60c	
50	Noonday	90c	
100	Overman	20½	
250	Syndicate	50@45c	
340	Tioga Con	25c	
300	Tuscarora	25c	
1050	Wales	50c	

BAULKY ENGINES.—The engine of the elevated railway has a perfect right to take the "studs," and refuse to perform its little part in the fair programme, when its huge rivals of the outdoor world set the example. Last Sunday, the passenger engine on the S. F. and N. P. road run out of the Cloverdale depot to wood and water, preparatory to the return trip to the city. When this little chore was completed, she refused to return to the depot to take up the train. In vain did the engineer turn on the steam, swear and coax with words and crowbar hy turns; the monster only said cheeoocheeoo, and stirred not an inch. Another engine was then fired up, the refractory one pulled out of the way, and the excursion train started an hour and a half late, and arrived in this city an honr late. This road will either have to sell out to Villard, huy new engines, or hire oxen soon.

THE gross receipts for the fiscal year ending June 30, 1881, at the port of Wilmington, amounted to $31,500.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Aurora M Co	California	3	10	July 5	Aug 6	Aug 31	P Conklin	535 Market st
Addenda M Co	California	5	10	July 11	Aug 17	Sept 6	T H Dixon	238 Montgomery st
Alpha Con M Co	California	14	1 00	June 20	July 25	Aug 15	W Willis	309 Montgomery st
Argenta M Co	Nevada	8	10	July 7	Aug 11	Sept 2	E M Hall	327 Pine st
Bullion M Co	Nevada	20	60	July 21	Aug 25	Sept 15	J M Brazell	328 Montgomery st
Belmont M Co	Nevada	29	15	July 27	Aug 30	Sept 26	J W Pew	310 Pine st
Best & Belcher M Co	Nevada	21	50	July 12	Aug 16	Sept 7	W Willis	309 Montgomery st
Caledonia M Co	Nevada	36	25	July 7	Aug 11	Aug 31	R Wegener	414 California st
California M Co	Washoe	1	30	June 30	Aug 6	Aug 25	C P Gordon	309 Montgomery st
Con Pacific M Co	California	3	40	July 9	Aug 1	Sept 1	F E Luty	330 Pine st
Grand Prize M Co	Nevada	6	25	July 30	Sept 3	Sept 23	E M Hall	327 Pine st
Gould & Curry S M Co	Nevada	40	50	July 15	Aug 19	Sept 8	H K Durbrow	309 Montgomery st
Gila S M Co	Nevada	8	25	July 22	Aug 23	Sept 6	J T McGeoghegan	318 Pine st
Hale & Norcross S M Co	Nevada	70	50	July 12	Aug 18	Sept 7	J F Lightner	309 Montgomery st
Leeds M Co	Utah	5	25	June 17	July 23	Aug 22	D B Chisholm	327 Pine st
Mexican G & S M Co	Nevada	16	1 00	June 28	Aug 2	Aug 22	C L McCoy	309 Montgomery st
Maybelle Con M Co	California	2	20	June 22	July 29	Aug 22	W J Taylor	310 Pine st
Martin White M Co	Nevada	10	25	June 18	July 30	Aug 25	H L Scoville	309 Montgomery st
Murchie M Co	California	6	15	June 10	July 11	Aug 10	S D Rogers	328 Montgomery st
Mariposa L & M Co	California	21	1 00	June 8	Aug 10	Sept 7	L Leavitt	309 Montgomery st
Northern King M Co	Arizona	6	25	July 8	Aug 13	Sept 5	E A Holmes	318 Pine st
North Bloomfield Gr M Co	California	44	1 00	June 23	July 23	Aug 17	H Pichoir	320 Sansome st
Oneida M Co	California	15	3 00	July 21	Aug 29	Sept 20	F P Bush	431 California st
Overman M Co	Nevada	50	50	July 20	Aug 24	Sept 14	G T Edwards	414 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Andes M Co	Nevada	17	50	Aug 8	Sept 14	Oct 4	B Burris	309 Montgomery st
Arizona Mexican M Co	Arizona	1	50	June 7	July 15	Aug 8	G R Adams	320 Sansome st
Black Hawk M Co	California	12	10	July 15	Aug 19	Sept 9	H A Charles	419 California st
Con El Dorado M Co	Nevada	2	10	June 27	Aug 12	Aug 18	J M Buffington	339 California st
Eintracht Gravel M Co	California	7	5	June 14	July 21	Aug 9	H Kunz	200 Sansome st
East Noonday M Co	California	2	05	Aug 3	Sept 8	Sept 24	C V Hubbard	310 Pine st
Holmes M Co	Nevada	2	10	June 22	July 25	Aug 15	E A Holmes	318 Pine st
Iowa M Co	Nevada	14	05	July 27	Sept 12	Oct 3	C S Leavitt	411½ California st
Lodi M Co	Nevada	3	05	July 19	Aug 22	Sept 12	A B Paul	328 Montgomery st
Mono M Co	California	13	50	Aug 8	Sept 12	Oct 3	W H Lent	309 Montgomery st
May Flower G M Co	California	12	10	July 19	Aug 23	Sept 13	J Morizo	328 Montgomery st
Morgan Con Co	California	7	50	July 8	Aug 16	Sept 13	J Raphael	533 Kearny st
Mount Potosi M Co	Nevada	—	10	June 9	July 29	Aug 22	J H Sayre	330 Pine st
New York M Co	Nevada	26	10	July 16	Aug 18	Sept 6	D L Throuss	327 Pine st
Noonday M Co	California	3	50	June 28	Aug 3	Aug 26	Wm J Traylor	310 Pine st
North Noonday M Co	California	3	50	June 28	Aug 5	Aug 29	Wm J Traylor	310 Pine st
North Gould & Curry M Co	Nevada	1	25	July 15	Aug 15	Sept 6	N C Southard	331 Montgomery st
Oakland M Co	California	15	05	July 30	Aug 31	Sept 19	R D Hopkins	436 Montgomery st
Paris M Co	California	2	25	June 22	July 27	Aug 17	W J Taylor	310 Pine st
Paris M Co	California	2	25	June 22	July 27	Aug 17	Wm J Traylor	310 Pine st
Rocky Point M Co	California	8	05	June 21	July 25	Aug 15	W G Hughes	330 Pine st
Red Cloud Con M Co	California	10	20	June 22	July 27	Aug 17	W J Taylor	310 Pine st
Sierra M Co	Nevada	69	1 00	July 15	Aug 18	Sept 6	E L Parker	309 Montgomery st
Steep Hollow G M Co	California	6	1 50	June 21	July 26	Aug 18	J W Pew	310 Pine st
Spaulding G & S M Co	California	2	10	June 28	Aug 23	Sept 15	J W Pew	310 Pine st
Union Con M Co	Nevada	17	1 00	July 1	Aug 4	Aug 24	J M Buffington	339 California st
Union Con M Co	Nevada	17	1 00	July 1	Aug 4	Aug 24	J M Buffington	309 California st
Union Gravel M Co	California	17	50	June 28	Aug 4	Aug 25	H Pichoir	320 Sansome st
Utah S M Co	Nevada	35	2 00	June 28	Aug 5	Aug 23	G C Pratt	309 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alta M Co	Nevada	W H Watson	302 Montgomery st	Annual	Aug 18
Caledonia M Co	Nevada	R Waggoner	414 California st	Annual	Aug 17
Golden Fleece G M Co	California	F R Schermeier	735 Folsom st	Annual	Aug 13
Independence M Co	Nevada	E M Hall	327 Pine st	Annual	Aug 18
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	Annual	Aug 18
Noonday M Co	California	W J Taylor	310 Pine st	Annual	Aug 25
Rocky Point M Co	California	W G Pughs	320 Pine st	Annual	Aug 15
South Comstock Con M Co	Nevada	J M Burlington	309 California st	Annual	Aug 15
Shamrouth M Co	California	F Logan	328 Montgomery st	Annual	Aug 18
South Bodie M Co	California	H Dean	309 Montgomery st	Annual	Aug 16

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	July 20
Father De Smet M Co	Dakota	H Dean	New York	50	June 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Aug 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Aug 15
Silver King M Co	Arizona	J Nash	315 California st	25	Aug 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Aug 12
Western M Co	California	C S Curtiss	309 Montgomery st	75	May 12

The Mining Share Market.

The dullness in the stock market still continues, and one reason may he found in the fact that 33 assessments will become delinquent this month. These have been levied on account of 19 Nevada mines, 12 California and two Arizona mines. The two Arizona mines are the Northern King Mill, in Pinal county, and the San Pedro, in Cachise county. The *Bulletin* says:

As an illustration of the power of the Comstock mines to absorh money, we annex the following table, showing how much of the money collected for account of Nevada mines this year has gone into a single county in that State:

	Storey County Mines.	Total Nevada Mines.
January	$ 393,600	$ 563,600
February	583,400	633,400
March	159,900	204,900
April	755,450	885,450
May	345,800	517,800
June	357,000	440,810
July	80,000	227,500
August	870,800	918,300
Totals	$3,545,950	$4,391,760

It passes as a saying that Paris is France, and San Francisco is California. It is equally true that Storey county is Nevada in the matter of mining assessments, as over 80% of the money collected for that State is absorhed in that section. But it is probahly equally true that the same county has contrihuted over 80% of the bullion product of that State. The assessment money delinquent this month will be apportioned as follows:

Nevada—		
Storey county	$ 70,800	
Nye	32,500	
Elko	10,000	
Esmeralda	5,000	$ 918,300
California—		
Mono county	149,000	
Calaveras	10,000	
Nevada	10,000	
Placer	8,000	
Inyo	85,000	
Amador	3,000	265,000
Arizona—		
Cachise county	10,000	
Pinal	26,000	35,000
Totals	$1,218,300	$1,218,300

During the month of August, 1880, the amount delinquent was $1,233,200 on 33 mines, of which $856,200 was for account of Nevada, including $696,200 in Storey county, $207,000 for California, $100,000 for Arizona, $50,000 for Dakota and $20,000 for Mexico. The delinquent assessment roll for the first eight months of the year comparcs as follows:

	Mines.	Amount.
January	30	$ 780,500
February	20	880,400
March	29	417,400
April	39	1,068,450
May	28	678,800
June	29	754,810
July	30	579,900
August	33	1,218,300
Totals	247	$6,375,560
In 1880	319	9,191,700
In 1879	316	10,200,900

We are this year collecting only a little over two-thirds of the amount collected during the same period last year.

Bullion Shipments.

We quote shipments since onr last, and shall he pleased to receive further reports:

Ontario, Aug. 1st, $21,467; Barhee & Walker, 1st, $43,753; Hanauer, 2d, $24,450; Ontario, 2d, $5,314; Barbee & Walker, 9th, $2,075; Ontario, 4th, $45,225; Hananer, 4th, $2,500; Great Basin, 4th, $6,200; Ontario, 5th, $5,154; Stormont, 5th, $3,800; Germania, 5th, $6,300; Mayflower, 5th, $5,600; Horn Silver, 5th, $7,500; Ontario, 6th, $5,334: Hanauer, 5th, $2,350; Germania, 6th, $2,250; Great Basin, 5th, $1,600; Kesler, 5th, $1,400; Bodie Consolidated, 8th, $7,567; Syndicate, 3d, $6,866.50; Navajo, 8th, $4,000; Northern Belle, 3d, $5,779.38; Day, 3d. $2,550; Eureka Consolidated, 3d and 4th, $8,548.16; Northern Bslle, 6th, $8,143.88; Mount Diablo, 5th, $11,318.16; Independeuce, 8th, $3,400; Christy, 6th, $1,897.

A YEAR ago Humholdt lako waa so dry that horsemen could ride over its bottom without getting their horses' hoofs muddy It was then demonstrated, as it was supposed, heyond all question, that the lake had no suhteranean ontlet, and that it was dried up hy evaporation. Now the lake has spread out to its old size, and is larger than at any previous time in six years. Its waves heat against the railroad embankment at Brown's station, and its waters extend across the valley to the hills on the eastern side.

THE Metallurgical works at 318 Pine St., corner of Lsidesdorf, formerly owned hy Kustel & Riotte, now helong to G. Kustel & Co., Mr. Riotte no longer heing a member of the firm. Mr. Kustel's son still remains with him. At these works they have the experience and all the appliances for assaying ores and minerals, and testing ores in any desired way, by any process.

Mining Summary.

The following is mostly condensed from journals puhlished in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

AT WORK.—Monitor *Argus*, Aug. 6: Mr. Lewis Chalmers has a force of carpenters at work at the Exchequer mill, preparing leaching works for the reduction of the Morning Star ore, and will in a short time, we understand, have a force of miners in the mine getting out ore.

AMADOR.

SULPHURETS WORKS.—Amador *Ledger*, Aug. 6: Both the sulphurets works at Sutter creek are idle at present. The Lincoln Works, however, have suspended temporarily for the purpose of doing some necessary repairing. The Phoenix Works at Drytown are idle, and are not expected to start up before fall. The Bunker Hill and Zeile Chlorination Works are the only ones in full operation in the county at the present time.

BUNKER HILL.—The new shaft is making satisfactory headway, and the work of running drift keeps time with the deepening of the shaft. At the 400 level a drift has been run north a distauce of 250 ft. A few days ago this drift encountered a new ore body, 18 ft wide, and of great richness. It is estimated that this vast ledge will yield an average of $10 per ton. At the mill everything is running smoothly. The full 40 stamps are kept in motion with one of Knight's wheels, using 110 inches of water. Crandall's wheel, that was first tried, required 220 inches, and proved greatly inferior in every respect to the Knight wheel. The 3 processes of saving sulphurets—Hendy, Frue and Blatchley—have been practically tested at this mill, and the superiority of the Frue method satisfactorily demonstrated. The Blatchley machinery was stopped last week, and will be cast aside as a total failure. It does not answer as well even as the old method. The sulphurets works, operated in accordance with the new Mier's process, are giving excellent results. The sulphurets are worked by this process up to 97% of the assay value By the processes heretofore in vogue, 90% of the assay value is considered an unusually good yield. The mill turns out from 2½ to 3 tons of sulphurets per day, and the chlorination works are run only in the day time.

MEDIAN.—This property lies east of the Keystone. A few weeks ago it was bonded by O. C. Hewitt, Thomas Fleming and J. S. Hill for the sum of $5,000. They started in to develop the property, and worked on it for about a month. The shaft is 90 ft deep. There are 2 ledges, one 3 and the other 2 ft wide The quartz is of good quality, and will undoubtedly pay well. Last week, Messrs. Hewitt, Hill and Fleming sold their hond to a San Francisco company for $3,000. This sale was effected before the second ledge was developed. All the indications point to the development of a valuable mine on this property. Three men are employed crosscutting.

CALAVERAS.

RICH ROCK.—Calaveras *Chronicle*, Aug. 6: We are informed that several men with riding horses and 2 pack animals are traveling over the country prospecting quartz, and supposed to be in the interest of French capitalists. These parties found some rich rock near the head of the Esperanza creek, near the wagon road between Railroad Flat and El Dorado. They sunk a shaft some 6 or 8 ft in depth, and struck a vein of quartz about 3 ft in width, and rich with gold. The parties are busy at work, and think they have a good mine.

EMPIRE CITY MINE.—We hear very flattering reports of the prospects in the Empire City gravel mine in Old Woman's gulch. Some very fine gravel has been struck, which pans out well. There is every indication that this mine is going to turn out to he a very handsome paying property. The gravel just found, it is estimated, will pay $3 to the carload—a carload containing about 60 pansful of gravel. The hottom of the channel is not yet reached, and it is reasonable to expect richer dirt farther down.

A GRAVEL MILL.—A 5-stamp gravel mill—with means for donbling the number of stamps if necessary—is in course of construction on the Corral Flat mine. Work is progressing to that extent that it will not be long before the mill is completed and will he put in operation. The work of putting up the mill is under the direction of Mr. John Steele, a first-class millwright, and that the work will be properly done is a certainty. The mine is looking fine, as work is being rapidly pushed ahead. When the mill is set to running, we have no doubt at all but that the Corral Flat mine will give a good account of itself, for we are told that the gravel prospects splendidly, and there is lots of it. It is well known that a heavy hed of gravel underlies the whole flat. A great amount of gold has been taken out of it in former years. In fact, it has the reputation of having been one of the richest gravel beds in this vicinity. And as the gravel which has been taken out is but a mere fraction of what is known to remain, it is reasonahle to suppose that a vast amount of auriferous matter still lies imbedded in this deposit.

GLENCOE ITEMS.—The big mill in Valentine gulch is progressing finely. The building is covered, and carpenters are working on the batteries. The company is taking out ors to have it ready for crushing when the mill is completed. The Longly mill will soon be repaired, and will probably be started to crushing as soon as it is ready. Lewis & Fairchild are busy every day taking out rock that would make even an editor envious—could he see it.

EL DORADO.

COLOMA.—Cor. Georgetown *Gazette*, Aug. 3: The Chinamen are showing considerable enterprise; on this side of the river they have put in a wheel and pump, and are working the channel near the bank, and have struck some very good looking gravel—new ground—while on the north side they are building an extensive race for working the present river channel.

THE GOPHER-BOWLDER MINE.—*Mountain Democrat*, Aug. 6: The new mill at the Gopher-Bowlder mine is about completed, and 10 stamps will be set in motion next Monday. The underground work has fully kept pace with the building operations. The tunnel running west from the mill toward the main Bowlder ledge reached the banging wall at a distance of 70 ft, and has tapped a body of fine ore. At this point it is fully 70 ft across the ledge from the hanging to the foot wall. The other tunnel, which is being run northwesterly from the mill to connect with the "Slip incline," has been driven over 200 ft, and is making rapid progress. The distance to the incline is about 1,300 ft, at which point the new tunnel will tap the ledge about 75 to 80 ft below the old workings, which have been cleaned out and timbered, and the ore found to be of high grade, of which there is not less than 5,000 to 10,000 tons in sight. New track has been laid in all the tunnels. Over 4,000 ft of pipe has been laid to connect the mill with the source of water supply, and on the whole there has been a tremendous expenditure of energy and a vast amount of systematic work done on that property within the last 3 months. And next Monday the mill will begin to "chaw quartz."

STARTED UP AGAIN.—Crushing was again commenced last Tuesday in the Placerville gold quartz mining company's mill, and we understand that they are crushing better ore than has ever before passed through that mill.

BIG CONTRACT.—The fore part of this week, L Landecker closed a contract for the delivery of 100,000 lbs of supplies at the Mount Pleasant mine, Grizzly flat, where preparations are in progress for a big season's work.

INYO.

PANAMINT.—Inyo *Independent*, Aug 5: A letter states that G. M. Pinney is out from New York completing a consolidation of all the important Panamint interests. The Pheby & Anthony lease of the mill has expired, but we believe they intend making another run. The last shipment of bullion amounted to some $11,000, instead of $0,000 as stated. The canyon road, which cost the Surprise Valley company some $6,500 to build, was covered by the water spout with rocks from 4 to 10 ft deep, and it

will cost some $5,000 to restore the road in as good shape again.

A New Discovery.—A fine vein of silver ore has been discovered in the Beveridge district. Two assays of the ore, made by Mr. Woodhull, show respectively $457.08 and $494.82 per ton in silver.

Lookout.—Frank Fitzgerald has a force of men extracting ore from No. 4 tunnel and the long tunnel of the Modock mine. He expects shortly to fire up the furnace, working the ore taken out, rich flue dust and slag.

Returned.—Gomer Jones, the well-known miner and prospector, has returned to Panamint from a trip to Mexico. He gives a bad report of that country generally, as to its mines and all kinds of business. Mr. Jones is about making his fourteenth trip to the Death valley country, still in search of the "Breyfogle."

Taking a View.—S. H. Moore has been making an examination of the Beveridge gold mines, and is now at Cerro Gordo looking over that district.

At Darwin.—The Defiance furnace was to have started up for a short run on the 1st inst.

Mine Bonded.—Mr. G. Gray, who has spent some time in examining the prospect around Bishop creek, has bonded the Ross & Page mine—time and terms not stated. The Ross & Page is a very promising looking ledge, the croppings showing a width of 30 ft, with stringers of fine silver ore running through it.

MARIPOSA.

Diltz Mine.—Mariposa *Gazette*, Aug. 6: In a shaft recently sunk about 20 ft deep, near the old works where the mine was opened when it was first discovered, a rich body of ore has been struck, and free gold can be seen letting out all through without the aid of a glass. We had the pleasure of seeing about 20 lbs. of the rock, taken from the bottom of the shaft, and it appears as we have stated.

MONO.

Up from Benton.—Bodie *Free Press*, Aug. 7: John F. Keating arrived in Bodie from the Benton country on Wednesday morning. He has been engaged in sinking a fine double-compartment shaft for the Tower mine, located about 8 miles from the town of Benton. At a depth of 150 ft water was struck, and sinking must be suspended until machinery is got in place, which will be done at once. The shaft is being substantially timbered, and the work is of a permanent character. The Tower is a rich mine, and ought certainly to do as well if not better than its neighbor, the Indian Queen.

The Fating Pan Mines.—Bridgeport *Chronicle*, Aug. 6: The interest in the new Mono mines, in the Sweetwater district, is steadily increasing, and scarcely a day passes that parties do not pass through Bridgeport on their way to those promising mines. This interest has been greatly enhanced by the cutting of a 2-ft vein of exceedingly rich ore in the tunnel of the Summers' claim. We have been unable to obtain the full particulars for this issue, but we are assured it is a rich strike.

NEVADA.

To be Worked.—*Foothill Tidings*, Aug. 6: It is stated, on what we call good authority, that the old Allison Ranch mine will soon be worked again. Eastern parties are about to take hold of the property. When the Allison Ranch shut down the last time (it has done so twice), there was very rich ore in the Carlton ledge, which is a tributary over the main ledge. There are undoubtedly millions of dollars in that mine, notwithstanding millions have been taken out of it. It is also probable that the North Star, which unit with plenty of pay quartz in the ground belonging to the property, will resume operations before many months. The contractors in the Ford & Mullen mine did very well with their work. After 60 days' work the contractors were enabled to distribute to each man of them the sum of $1,003, or $10 17½ per day. The trustees of the Idaho mine met last night, and with the same regularity that characterizes the rising of the sun, declared the 144th dividend to the shareholders of the company. This dividend is $7.50 per share. The production of the mine for the past month was, in round numbers, $42,500.

A Good Little Mine.—*Transcript*, Aug. 9: The Omega quartz mine, comprising 1,500 ft along a ledge in Willow valley, and supposed to be the eastern extension of the Deadwood, is making a good record. It is owned by Messrs. Johnson & Gagen. The former gentleman recently leased his interest to Mr. Toward, who, with Mr. Gagen, has during the past 4 weeks taken out 21 tons of ore above water level. They had it crushed at the Deadwood mill, and yesterday morning brought in the clean-up, which amounted to a little more than $20 a ton. The work on the claim has thus far been done by means of a whim. With machinery to enable operations below the water level it is believed still better profits could be obtained.

PLACER.

Poole.—Placer *Argus*, Aug. 6: The Poole M. Co. are meeting with flattering success in the work of prospecting their quartz claim at Humbug canyon. About 12 men are employed there now, and for some time past. They work day and night shifts. One tunnel is now in about 100 ft, another, lower down, about 70 ft. The mine is about 7 miles distant from Alta, and it is located on the south side of the South Fork of the North Fork of the American river. The company are interested in 3 other claims situated near the Poole mine. One of these is a ledge farther up the river. It is operated by the Dorer Bros., Richard and Leopold, and from them it takes its name, the Dorer ledge. There are 2 tunnels also in this mine, each of which is from 50 to 60 ft in length. One hundred and fifty tons of good rock has lately been crushed from this mine, also with good results.

PLUMAS.

Monte Christo.—Oroville *Mercury*, Aug. 6: William Allstrom, the manager of the Monte Christo mine, passed through this city Monday on his way to the mine. Mr. Allstrom is probably the most extensive mining operator in Plumas county. He has expended over $200,000 in developing the Monte Christo, and the amount of work accomplished is something remarkable. The methods adopted by him in operating this valuable property are complete in every detail. While in Oroville he purchased a steam sawmill. Mr. Allstrom is also manager of the Big Bend mine.

SHASTA.

Wilbourn Con.—*Mountain Messenger*, Aug. 6: Work on the mine has been suspended for the present. The shaft is down 204 ft from the surface, in fine quartz gravel and sand, interspersed with large bowlders. Operations will be resumed as soon as the stockholders determine on the best course to pursue.

Black Jack.—We learn that no work is being done on the Black Jack mine at present. The Supt. left some time ago, and no one has yet offered to take his place.

Prospecting.—A company from Oakland, superintended by Dr. Draper of that place, is prospecting for an extension of the Rainbow ledge between the Golden Star claim and Cold spring, on the north side of Kanaka creek.

Coonyear Bar.—The mines hereabouts generally pay well for these times, and occasionally a rich strike reminds one of the pans of gold of the never-to-be-forgotten days of '49.

SISKIYOU.

Dams.—Siskiyou *Journal*, Aug. 6: The French company, below Oak Bar, have got their dams in, and are now down some 10 ft, and are at present taking out lots of "filthy lucre." The rest of the claims below have all good prospects for a good season's run, as the river is reported as going down fast.

TRINITY.

Looking at the Mine.—Trinity *Journal*, Aug. 6: Mr. Thos. R Watson, of the well-known New York broker firm of Watson & Gibson, and Mr. I. M. Taylor, mining engineer, of San Francisco, passed through here last week on their return from a visit to the Taylor Flat mine, in which they are interested. Both gentlemen speak enthusiastically of the appearance and prospects of the mine. They were accompanied by Geo. R. Gibson, Esq., who goes to San Francisco on a brief visit.

Contract Let.—Jos. Falan has taken a contract to extend the Bullychoop and Occidental tunnel 100 ft, unless the lode is struck in a shorter distance. A survey indicates that it will take 70 ft to strike the ledge, providing it goes down perpendicularly. Otherwise "you never can tell." Mr Falan has gone to Bullychoop and will commence work at once.

Flume Robbery.—Some industrious person or persons went into Holman & Co.'s flume one night this week and cleaned up 12 boxes thereof. As Holman & Co. had themselves cleaned up the flume only a few days previously and had not run any since, it is probable the would-be robbers did not realize very handsomely. Our informant says this robbery of a flume which has already been cleaned up may be regarded as a sure sign of a hard winter.

NEVADA.

WASHOE DISTRICT.

Sierra Nevada.—*Enterprise*, Aug. 9: A station is being cut out at the 2700 level of the joint east Union cut, winze. Have completed repairing east crosscut No. 1 on the 2500 level, and have extended east crosscut No. 2 30 ft. Are easing timbers in the main north lateral drift. On the 2700 level the joint Union Con. east drift 1 ole No. 1 from the station has been extended 90 ft, and drill hole No. 2 has been advanced 10 ft. Are taking out the main pumps and cleaning out the shaft.

Ophir.—The station at the 2900 level of the joint Mexican east winze has been completed. The joint California east winze has been sunk and timbered 14 ft. Are repairing steam pipes.

Utah.—During the past week the incline has been sunk and timbered 12 ft. The ground in the bottom is very hard. A crosscut west has been started from the north drift on the 400 level.

Alta.—During the past week we have sunk and timbered the shaft 10 ft; total depth, 2,158½ ft. Have put in the 2150 station set and are now sinking for the sump. A broken gallows-frame sheave delayed us 24 hours.

Mexican.—The joint Con. east winze has been sunk and timbered 8 ft. The station at the 2900 level of the joint Ophir winze has been completed. The main north lateral drift on the 2700 level has been extented 15 ft.

Union Con.—Are cutting out a station at the 2700 level of the joint Sierra Nevada winze. The joint Mexican east winze has been sunk and timbered 8 ft. On the 2700 level east drill hole No. 1 has been extended 90 ft, and east drill hole No. 2 has been advanced 10 ft.

California.—During the past week 64 tons and 1,000 lbs of ore, assaying $——per ton, have been extracted. On the 2500 level the joint Ophir winze has been sunk and timbered 14 ft. Also, have completed the station and commenced sinking the joint Con. Virginia winze. The south drift from the bottom of the C. & C. shaft (for a sump) has been completed.

Yellow Jacket.—The east drift on the 3000 level has been run 34 ft since last report, making the face of the same 315 ft from the shaft. We are making preparations to resume sinking the same to the 3000 level, or about 140 ft on a slope of 45 degrees. During the week we have been employed cleaning the sump and placing a second 14-inch pump and column at the 300 station, which, when completed, will give us a double line of 14-inch pumps from the sump to the Sutro tunnel level.

CANDELARIA DISTRICT.

Northern Belle.—*True Fissure*, Aug. 6: The shaft levels are looking well throughout, particularly the intermediate between the 1st and 2d levels. In running a crosscut in new ground on the 1st level, a body of ore has been opened which is 20 inches in width and looks quite promising. The 10th and 11th levels are showing very well. The ore vein on the latter widened on Sunday, and the outlook there is quite encouraging. All the levels above the ones mentioned present about the same appearance, and are yielding as usual. There are being extracted and sent to the mills about 85 tons of ore per day. The shipment of bullion for the week ending Aug. 3d was $30,896.79, and the total on August account was $37,964.88.

Mount Diablo.—A 2 months' run upon ore from this mine was finished yesterday at the mill of the Northern Belle company. No ore is being extracted now except such as is necessary in the work of prospecting. The winze at the bottom of the mine looks well. Bullion amounting to $8,001.78 was shipped on July 29th, and $10,032.66 on Aug. 2d.

Gen. Jackson.—The work of development is progressing slowly but steadily on this mine. Only 4 men are working. The force will be increased very greatly as soon as the mine is put in condition to work to advantage. A little ore is being taken out all the time.

Holmes.—The main tunnel has been advanced during the week 18 ft. A station has been cut, and a winze started and sunk 8 ft. The formation in the winze is good working ground, and rapid beadway may be looked for.

CRABB DISTRICT.

Rich Strikes.—Esmeralda *Herald*, Aug. 6: For some time of late a few persons have been at work on claims in Crabb mining district, situated about 5 miles from the crossing of East Walker, toward Walker lake, on the old Wellington and Reese River road. Last week some of the richest quartz we have seen for some time was sent us from several ledges in the new district, the quartz being literally covered with coarse gold. The ledges vary in thickness from 18 inches to 6 ft. The quertz very much resembles that of Mill creek, and is fully as rich. For the emount of work done the claims show very good indeed. The district is about 2 miles from the East Walker river, which would afford a splendid opportunity for milling the ores at a very low figure. There are only about a dozen claims located as yet, but inside of a month there may be a live mining camp of several hundred men.

DESERT DISTRICT.

At Work.—*Silver State*, Aug. 8: We are informed that there are from 25 to 30 men at work in Desert district, about 6 miles from the Desert Crystal Salt Works at White Plains. The Churchill mill and mining company are running their 6-stamp mill steadily on ores from several mines which they own in the district, and the yield is said to be satisfactory.

ESMERALDA DISTRICT.

Cortez.—Esmerald *Herald*, Aug. 6: Owing to the death of Henry O. Clark, who represented the company of New York capitalists, the Cortez mine has been shut down for a few days, consequently the progress for the past two weeks falls off a little, compared with the same period of time prior to his death. The other mines in the district are looking as well as usual. There are several new districts in the county from which are flattering reports, and never in the history of Esmeralda county have mining matters had such a prosperous outlook.

The Centennial.—The incline of the Centennial has been driven down 230 ft. The ledge in the bottom of the incline is showing much better than at any other point in the mine.

The Humboldt West.—Drifting still continues, and every stroke of the pick shows the Humboldt West to be one of the largest and most regular ledges in the State. A 20-stamp mill on this property would turn out bullion that would pay a handsome interest on the money invested. The smaller mines at work are looking about as usual—good prospects.

EUREKA DISTRICT.

Strike.—*Sentinel*, Aug. 8: The *Sentinel* is informed that an important strike was made in the Kit Carson mine a few days since. About 3 ft of solid galena ore was encountered, giving assays as high as $200 per ton. The development was made in the deepest workings.

MARIETTA DISTRICT.

New Ledges.—Esmeralda *Herald*, Aug. 6: There have been two ledges found about 4½ miles west of Marietta. The one owned by W. N. Cook and J. C. Melring has been very well tested. They report having shipped 10 tons to the Lyon Mill Co., at Dayton, and the returns showed nearly $500 per ton. About 1 mile from this mine is another one of the same character, owned by Schofield & Co. Cook & Melring are at work on their mine. Geo. W. Grayson is talking of starting up the old Endowment mill if not sold very soon.

ARIZONA.

Carrie Copper Mine.—*Arizona Journal*, Aug. 5: Messrs. Erland & Stargis, who came out from New York about the first of the year to assume control of the Carrie copper mine, in Globe district, have pushed work with great energy and spirit. A shaft has been put down 135 ft, all in ore. Tunnel No 1 has been run into the hill 265 ft on ore. Tunnel No. 2 is in 165 ft. There is now 200 ft of stoping ground. The smelter is all ready to start up. Hauling of ore from the mine to the smelter was commenced July 28th, and in a short time the Carrie will be recorded as one of the bullion-producing mines of the Territory.

Copper Shipments.—The Copper Queen mine shipped during the month of July 150 tons of bullion. This is less than the usual monthly shipment—the heavy rains having made the roads almost impassable. There has been a material falling off in the price of copper bullion in the market. It is said the shipment from Arizona will be materially diminished unless the price of copper advances. The Clifton Copper Co. have determined to stop shipments, owing to the low prices prevailing. The Copper Queen will doubtless do the same until prices enhance. The copper companies prefer to hold their bullion rather than sell at the present prices.

Hermosa Mill Running.—The recent heavy rains caused very material damage to the town of Harshaw. The flood from the watershed of the Patagonia mountains came down like a torrent, flooding stores and doing material damage in all directions. The Hermosa mill is now running at full capacity, having an abundance of water and ore. This mill has been running only at half capacity for some time previous to the recent rains, on account of the scarcity of water. Mr. Corrington Johnson, the efficient superintendent, has largely increased the number of employees, thereby giving new life to things about town. Our informant states that everything is looking brighter at Harshaw.

Shut Down.—Tombstone *Epitaph*, Aug. 5: The Girard shut down this morning, pending the test for water in the Sulphuret and the uncertainty of where the mill will be built—at the mine or on the river. The extraction of ore is not a money-saving operation under the present conditions. If the mill is to be built at the mine it will stand higher up than the ore dump now is and will all have to be hauled up the hill. If the mill goes to the river then a regular dump will have to be built, with automatic spouts to empty into the ore wagons. The suspension will only be temporary, hinging entirely on the water supply from the Sulphuret mine, which will be thoroughly tested as soon as the pump gets out of the mud between here and Benson.

Connection Made.—*Silver Belt* (Globe), Aug. 3: The connection has been made between the central and southern shafts on the South Pioneer, at the 70 level. The ore taken out in the drift is a sulphuret, with wire silver all through it. The last average assay from the ore breast, just before the connection was made, was $370.75. The Pinal mountains are seamed with veins of quertz carrying gold. Following the line of the road to Bremen's mill innumerable quertz veins cross it. On one of these locations have been made. The Hawkins mine, just beside the road has a shaft on it 60 ft deep, with a well defined ledge the whole depth, with free gold showing in it. This property is owned by Eaton & Slauchman, and, if it keeps its present showing, will become of great value, owing to its close proximity to wood and water. M. Whelen has some locations on the same ledge that show well, and from which free gold has been taken. On the south slope of the mountains the ores generally are silver. Work is progressing rapidly on the Old Dominion Co.'s mines. We are informed that there is an abundance of ore in all the openings. We continue to receive favorable reports of the Nugget. There is a steady improvement in the north drift. Mr. Lennon leaves within a fortnight for New York. Night and day shifts are at work on the Globe copper mine—an extension of the Old Dominion—and the developments are satisfactory.

Tombstone Bullion.—*Epitaph*, Aug. 7: Much to the regret of everyone, the severity of the storms during the greater portion of the last half of July so obstructed the delivery of ore to the mills, besides carrying away the dams and injuring the ditches along the San Pedro, that much valuable time was lost by the mills, which necessarily shortened the bullion output by about $75,000 what it was for June. Had it not been for these unfavorable incidents the yield would have overrun that of June by nearly an equel amount. Our estimates to-day will be only approximate, as full returns have not been received—the final clean-up at the mills not having yet come in. However, the final reports will not vary above or below but a few thousand dollars, which will not materially affect the general result. The following are the productive mines: Tombstone M. & M. Co. (no clean-up), $143,268.50; Contention, July 26th (official), $92,403.33; Contention (estimated) balance month, $16,000; Grand Central (estimated), $100,000; Head Center, July 24th (official), $10,121. Head Center (estimated) balance month, $6,000; Vizina, $50,000; total, $432,832.83. For June the same mines yielded as follows: Contention, $130,000; Grand Central, $125,000; Head Center, $28,353; Tombstone M. & M. Co., $157,553; Vizina Con., $36,500; total, $479,406; add product for July, $432,832.83; difference $44,573.17; add product Boston mill for June, $54,000; shortage for July, $98,576.17. From this apparent shortage we have to credit the Boston mill with several thousand dollars, or enough to reduce the falling off to $75,000 or less. The gain between this and the first of January next will be sufficient to make the year's product fully $6,000,000, or an average of a half million per month.

COLORADO.

Yield.—*Register-Call*, Aug. 5: Mr. G. W. Barrett brought over yesterday from the Rollins stamp mill at Gold Dirt, 44 ounces of gold retort, the yield of 6 cords of ore—an average of 7⅓ ounces per cord. This ore came from the Perico lode.

Hatch & Schaffer, owners of the Star of the Mountains, have purchased the lease recently given by them on that vein to Oahlger & Co., and will hereafter develop it under their own management. A shaft building and California whim is to be placed over the main shaft.

The Bohtail G. M. Co. left at the Rocky Mountain National Bank last evening a gold retort weighing 440 ounces of gold, which, at $17.60 per ounce, would have a currency valuation of $8,762.90. The retort was the result of an eight days' clean-up from 100 stamps. This is one of the largest yields received from any mine in Gilpin for months, for that length of time.

Mining and Milling Items.—Sinking has been resumed in the Prize mine, Nevada district, worked by J. W. Bostwick & Co., and a level west is being driven at a depth of 400 ft. W. J. Lewis & Co. have removed the machinery from the Lewis lode, on quartz hill, to the Manitoba lode in Vermilion district, and have it in running order. The main shaft on the Manitoba has been relieved of accumulated water, and sinkiog was commenced again this week. A quantity of ore from the Gold Anchor lode, in Independent district, is being treated at the New York mill. The amount of smelting ore received at the several sampling works in Black Hawk during the month of July is largely in excess of that of the previous month. There is no prospective abatement in the supply for the present month. A large amount of it comes from Nevada district. The new concentration works and stamp mill of Col. P. R. Smith, in Russell gulch, are in readiness to treat ores. They will be started up as soon as water is let into the Consolidated ditch.

IDAHO.

Wood River Bullion.—*Times*, Aug. 3: The Wood River Smelting Company's furnace has been running all the week, with but slight interruption, and has produced about 25 tons of bullion, averaging 220 ozs. As the men get accustomed to the furnace, everything runs smoother, and in a week or 10 days the bullion output will probably be increased to 30 tons per week. In a few days the company will begin roasting the matte, to recover the iron, gold and silver which it contains. The smelting company has contracted for 30,000 bushels of coal more than will be required to run until Jan. 1st. If the roads are kept open it will run all winter.

A Gold-Bearing Lode.—Jas. Richardson has 3 claims which are situated about a mile and a half northeast of the Rock Creek station, on the Boise road, the ledge in which, at a depth of only 5 ft, is 3½ ft wide, and assays an average of over $200 per ton. The assays show about $10 of gold to $1 of silver—thus going to prove the existence in this section of ore carrying a high percentage of gold. The claims whence the ore came are situated about 12 miles from Hailey.

The Bullion Hoisting Works.—The hoisting works at the Bullion mine will be ready for use in about a week. The mills being unable to supply the heavy timbers required for the foundation and gallows-frame, Col. Wall had some red fir trees hewed to the required size. There being no pig-lead handy, Col. Wall used 400-oz bullion for soldering his anchor bolts.

Teams Getting Scarce.—It is evident that several thousand tons of ore will be snowed up on the dumps this fall. There is already more ore ready to ship than can be hauled by the teams, and as the season advances, the ore will accumulate until it shall become almost impossible for prospectors to get the ore to the railroad.

Kinkirkie District.—Yankee Fork *Herald*, Aug. 3: A great deal of prospecting is being done, and new discoveries are reported right along. The lucky Dan Osgood and Capt. Ring discovered an 18-inch vein of ore in their ledge on the eastern side of Washington basin, averaging from 200 to 300 ozs of silver per ton. The Germania is owned by Fred Winteshog & Co. The ore vein is solid, and contains a streak from 6 to 20 inches wide that averages from 150 to 400 ozs per ton. A force of men are at work running the tunnel on the vein, which is so flat that the ore is easily wheeled up the foot-wall. The tunnel is in 65 ft. There is from 25 to 30 tons of first-class ore on the dump ready for shipment. About 2,000 ft in a northeasterly direction is the Croesus, which shows a good vein of ore for a distance of 900 ft on the surface. At a distance of one mile in a northwesterly direction from the Bibis Back, in Washington basin, is the Washington mine, owned by Fisher, Boorn & Co. It is a mammoth ledge, showing a fine vein of quartz and rich galena. A force of men are busy developing it.

MONTANA.

Moose Creek.—Butte *Miner*, Aug. 5: Striking Moose creek—once famous for coarse gold, the Big Nugget and Nigger's claim—the old placer camp was found quiet, but not tectotally dead. Messrs. McKag & McKee have been working their Stripping claim in the gulch this season, from which they have realized handsomely. Operations in the Highland district are assuming importance. The quartz mines of the district, which have laid idle for some time, are to be opened again and vigorously worked. The Only Chance Co., of which Mr. Phil M. Saunders is the superintendent, has commenced active mining operations. The Nevius mine is being worked, the gold quartz from which is crushed in an arastra. Before fall 75 men will be at work in the Highland district.

NEW MEXICO.

Running Smoothly.—*New Mexican News*, Aug. 3: A Bonanza city man came in last evening and reported that the Duryee furnace is running smoothly. The many difficulties incident upon the starting of the machinery have, it is believed, been overcome for good, and the managers are confident that from this time they will be able to keep the thing going. The ore is running much higher than was expected, and everybody is delighted as may be presumed.

Black Range.—Prof. Mahany has gone East to submit to various mining companies full and detailed reports of the Black Range country and its mines. Prof. Mahany's last trip to the Range, which, by the way, was the occasion of one of the most thorough explorations of the country yet made by a scientific metallurgist, was made for the purpose of collecting the data to be used in the compilation of these reports. The men for whom this information is secured commend much capital.

OREGON.

Sterling.—*Democratic Times*, Aug. 5: The Sterling Co. has purchased the mining property of Kleinhammer, Reynolds & Towne, at a bargain, paying $2,500 therefor. These diggings have always been worked to a good profit, and we have no doubt but what Supt. Ennis will prove their value in quick time. The company owns the most desirable mines in Oregon, taking out immense quantities of gold dust annually.

Items.—Gin Lin is still piping with a fair head of water. Prof. Tiernan is building smelting works at Spokane falls. The Applegate gravel diggings are being worked again by Dan Silva. Orme & Co. are commencing preparations for the prospecting of their quartz ledge on Foots creek. Lence & Co., of Foots creek, are engaged in making extensive preparations for winter. They will in all probability cast aside their little pipe and use a "Giant" hereafter. W. Prefontaiu, of Foots creek, informs us that about all the miners in that section have cleaned up, but the results have not generally been as favorable this year as last. Wimer & Simmons, of Waldo, continue cleaning up. They expect to do better than ever this season, and some who pretend to know estimate that they will take out over $20,000. Jesse Adams took out $3.50 in gold in one day's prospecting on Talbott's place on Wagner creek, and a $5 piece of gold quartz was found on the ground a short time before. Newell De Lamater, of Kerbyville, was in town this week. He informs us that about 25 men are engaged in digging the ditch leading to mines on Cow Flat he is interested in, who will soon complete their contracts. Everything will be in shipshape when water comes, and extensive operations are prospective

UTAH.

North Horn Silver.—Southern Utah *Times*, Aug. 6: Work on this property is steadily progressing night and day. The deep tunnel on the extreme north end is in about 60 ft, with a good showing of ore. The face of the tunnel is only just getting into the mineral-bearing rock, and, as its course is diagonally across the ledge toward the hanging wall, the presumption is that in running to it a body of ore will be cut. About midway on this property is located the Republic mine, on which a shaft is down 60 ft in heavy black iron, deeply stained with copper. This shaft is being sunk near the hanging wall of this vein, a distance of 140 ft from the foot wall. Along the latter wall, at intervals in the out-croppings, there are seams and spots of lead ore that contain from 25 to 50 ounces silver per ton. This ore has a gangue of carbonate of iron—a natural flux.

Our Mining Interest.—This week has brought us some few changes in our mining interest. Mr. Cullen came here for the purpose of commencing work upon the Lulu, and a force of men was started early this week. The owners of this property are all wealthy, and are confident of unveiling a bonanza equal to the Horn Silver. The Grampian mine, situated westerly from the two properties named, has also new life thrown into it by Mr. Donaldson, of Denver, Col. Matters are now adjusted and everyone paid in full, and work has been resumed on the property. With the exception of about one claim, lying between the Horn Silver and the North Horn, we have mining operations in full blast, and with extraordinary prospects along this great vein for a distance of nearly 2 miles, we regard the prospects of our camp as more bright than at any time during the past year. Capital is being invested and work carried on with a will.

The outlook of Plumas, says the *National*, is 50% better at the present time than ever before. The mines never looked half as well, and new ones are being discovered every day.

The High Sierra and its Royal Robe.

[Read before the assembly of the C. L. S. C., at Monterey, July 7, 1881, by J. G. LEMMON, and furnished for publication to the PRESS.

The Sierra Nevada is a rich, lordly, be-jeweled prince among our mountain ranges. Other chains of mountains ribbing the earth are usually high-raised elevations, composed principally of large, rounded mountains swelling their bosoms toward the sky and trailing their thin, tattered garments far out over extensive, abutting foothills to the flanking plains.

The long Rocky Mountain range, the backbone of North America, is of this class. It rises so gently from the plains on each side, that the traveler by the Union Pacific can scarcely discover that he is on a mighty swell of the earth's crust, or detect the exact spot where he passee the broad saddle of the highest point.

But our Sierra Nevada is not so. He is distinguished alike by the geographer or the traveler, for the steepness of his majestic uprise from the plain, the rough-hewn and splintered form of his thousand peaks, the high elevation of their pinnaclee ever bearing their crowns of snow; but most of all, he is pre-eminent for his bounteous and beauteous enrobing forest, his royal, parti-colored garment.

Like an Oriental monarch, he reclines in state upon the bosom of the great treeless plain of Western America, enwrapped from head to foot—600 miles—and from eide to side—140 miles—with a dense forest of evergreens, interspersed with many-colored, deciduous-leaved trees, like insertions of brilliant figuree in a royal emerald robe.

This enrobing forest—tbe noblest in North America—ie perforated along its raised center line, or axis of the Sierra, by a thousand peaks rising tbrough the mantle into the region of perpetual winter, while both slopee are rent by a million valleys depressed through the robe into the middle region of changing seasons. Often these valleys are still filled with water from the melting snows above, forming lakes of matchless purity and beauty.

The snow-crowned pcaks are the sparkling diamonds of this wealthy prince, the valleys and lakes are his resplendent emeralds and pearls. The former flash upon the voyager floating on the far westcrn Pacific or the toiler over the wide eastern desert; but the royal robe, with its decoratione of valley and glen, its geme of tree and shrub, flower and fern, reveal themselves to the miner in the canyons, the farmer herding his flocke in the grassy valleys, or the hunter pursuing his game through the forest.

But, of course, these peculiarities are observed most of all by the lover oi nature, who explores the Sierra with heart attuned aright and perceptions opened by interior appreciations, for it is an old saying:

"'Tis the world within creates the world without."

Such a visitor's first emotions are a mingling of astonishment, awo and delight. If he has explored tropical countries, he will he disappointed by the fewness of species, perhaps, but surprised by the great multitude of individual trees and their large size. If he is familiar with Arctic scenes, he will miss the dwarfed trees and monotonous sameness so foreign to the Sierra.

Vegetation in the Zones.

Two other comparisons are pertinent here, also. In tropical countries, life presses in and holds the ground against fierce-opposing contestants. This is especially observable in the vegetable world. A small epring issuing from a mountain side in Arizona or Mexico will be attacked at its very source, and its watere abeorbed by the eager rootlets of a hundred speciee of plants, a broad-headed hackberry or a tall cottonwood crowning the mace of foliage and striking its roote deepeet under the rock floor of the spring. Streame large enough to feed all the thirsty gourmands by the way, and yet escape to the plains, are marked all through their winding couree by a hroad border of vegetation.

Shade and northern inclination aleo foeter vegetation for obvious reaeone; hence the north slopes of most of the peake, and eepecially of the eteep ranges of Arizona, have a vestiture of foreet, though it is mainly thin and low.

In Arctic climee, the cold, long wintere forbid all but a few eepecially hardy plants from gaining a foothold. Thc entire face of the country heing moist, the plants are not alone found along etreame, but equally diepereed, varying only by conditione of elevation or inclination. The water couree are hordered with meadowe composed ueually of hut one or two speciee of grase or eedge.

So, also, large foreste will be found containing but one or two kinde of treee, and these are emall, dwarfed and snow-hent, at length reduced to prostrate creeping huehee on the ehores of the Arctic eea.

But the Sierra of California occupies a middle position between torrid and frigid regions, a position moet favorable to the producing of large foreste containing many epecies of noble trees and rich valleys of divereified flowere.

Trees of the Sierra.

The enrobing foreet is compoeed mainly of evergreene, not one epeciee of which is identical with any at the East—if we except a little, dwarfed variety of juniper, that barely reaches the Sierra from the east. It ehares, however, eeveral epeciee with the Rocky mountains at the east and the Coaet range on the west.

Chiefeet among theee evergreene ie the chief of all treee—the "great *Sequoia*." So much hae heen written and sung about tbis tree, detailing its immense proportions and eetting forth its history and destiny—I, myself, contributing to the local papers several articlee in times past—that I will not add worde here to this truly marvelous tree, the worthy king of the vegetable world.

Next to the "Big Trees" in size, but far excelling that species in loveliness, are the four species of fir trees inhabiting the high Sierra. These species arrange themselves in pairs as "red-harked" firs and "white-harked" firs; but they train together oddly; that is, each red fir has a white brother in attendance, like Don Quixote with Squire Sancho Panza. One of theso ill-assorted pairs, viz., *Abies magnifica* and *A. concolor*, inhabit the eouthern portion of the Sierra, while the other pair, *Abies nobilis* and *A. grandis*, are met with in the northern regions.

The Fir Family.

The fir family is at once distinguisbed by the eymmetrical shape of the tree, which is conical or fusiform; the limhs radiate horizontally in whorls of three to nine; the branches and twigs, also the leaves on lower limhs, are all disposed in the same way; hence, they resemble large fans, and touching each other at the sides, they form strata of airy basket work, that sit within one another in a diminishing seriee from bottom to top.

The cones of fir trees are borne on the long, uppermost limhs, and stand upright on the terminal, robust twigs. They are composed of numerous close-set scales, wbich fall away at maturity, together with the large, winged seeds, and leave the rachis or naked core of the cone remaining on the tree. Hence you never find fir cones lying ahout under treee as you do of the spruce, pine and cypress.

Chief of the fir trees, both in size and beauty, is the "red-barked fir," a name by which hoth the southern form and the northern is called—and very properly, too, for the hark of both ie a deep madder red when exposed; and they resemble each other in all essential detaile except one. The northern red fir, *nobilis*, has long, exserted bracts protruding from the cones and depending along the sides. The eouthorn red fir, *magnifica*, is generally devoid of these exserted hracts.

This species has been all along mistaken for the *Abies amabilis* of Donglas, and California botanists will probably continue to call it by that lovely name, notwithstanding Dr. Engelmann's recent clearing np of the whole matter, and conferring of the equally appropriate name of *magnifica*.

Travelers aver that no tree known exceeds these species of fir in their grand, symmetrical uprise and tho delicate tracery and airy beauty of their foliage. One has hut to visit a grove of these etately treee—notably around the bsse of Shasta—to receive impressions of grace, beauty, loveliness, majesty and perfection, that will serve for mental enjoyment while memory endures or the soul can comprehend.

Trees of these two red firs—*nobilis* and *magnifica* (or *amabilis*)—form dense groves on high plateaus, 6,000 to 10,000 ft. altitnde. Their color is a dark olive green, and their favorite position is usually just above the thinner forest of pines, with their lighter shades, while just above the fire ie usually found a fringe of the noxt family to be considered.

The Silver Spruce.

Tsuga Pattoniana, extending its beautiful, pyramidal figure, and green and silver foliage far up the canyons, hecoming dwarfed, at last, to bent, prostrate, snow-laden bushee at the foot of the glaciers or snow-clad pinnacles.

One can hardly, without inspection, imagine the heautiful effect prodnced mainly by the differences of tinte displaved by these treee, which are otherwise widely different in aspect. The "eilver epruce" treee, a trne alpine inhabitant of the Sierra, is often, in sheltered localitiee, very large, and with its eoon tapering trnnk and outline, they form an exceedingly graceful tree. The longeet limbe are helow, hecoming diminished until the top ende in a epire. The limbs all start downward from the trunk, then curve outward, lastly upward, hearing the small, purple conee in clueters from the ends of the terminal branches, like wide-epreading fingere.

Aesociated with the silver epruce is often found a variety of the Eaetern juniper epoken of, a low, creeping, prickly-leaved shrnb, covering rocke and knolle, remarkable principally for heing the only conifer tree from the East which reachee California, and it ie eingular, and perhaps fitting, that he ehould *crawl* thus into our Sierra flora.

Aleo, a variety of pine usually keepe close company with these last mentioned alpine treee, hut, like them, muet be dwarfed to low, thick-browed ehruhe, hearing its emall, glohular conee on ite ehort, etout, white limhe. This pine ie the variety *albicaulis*, of the epecies *Pinus flexilis*.

The Pines.

The last paragraph leade ue to the diecussion of the treee which compose the great mase of the Sierra forest, the beneficent pine, the moet ahundant, the easieet manufactured, the tree best adapted to various usee of all the treee on earth. They compoee eight-tenthe of all the treee that clothe the earth, and contribute three-fourths of the material for our housee, mills, bridges, roade, wharves, veesels, etc.

They are principally found in the northern temperate zone, and tho largeet continuoue forest of them ie in the Southern Statee, eoutheaet of the Alleghaniee, and extending from Miseiesippi to North Carolina. But the noblest, largeet, most valuable trees on earth form the chief warp and woof of the royal robe of Prince Sierra.

We cannot, in this paper, enter into statietics of the immense lumher business prosecuted in the Sierra—notably at Truckee—from which so large a part of California and Nevada, as also the greater part of the basin eastward and the desert southward are supplied. Two months ago, we rode into the town of Franklin, opposite the old town of El Paso, on the Rio Grande, with the firet conetruction train that entered the city. Several of the cars were loaded with lumber, compactly piled and bearing a placard marked, "From the Truckee Lumber Co." Two weeks ago, we visited Salt Lake City, and there in the depot of that thriving town workmen were nnloading care laden with lumber hearing the same legend. And last week, I saw, in contracts for huilding mills in Sonora, it ie stipulated by the Mexicans that the timber shall be of Truckee lumber.

The pine family proper ie a large one, comprising, in all the globe, about 68 species. There are, in California, 20 epecies, 9 of which are fonnd in the Sierra. A pine may readily be recognized hy its leaves being acerose or pointed, and persistent; and they are alwaye in hundlee or fascicles, which are sheathed at base, each fascicle containing from one to five lcaves each, alwaye alike in the same species. The difference in the number of leavee in a fasciole eervee tc divide the family into four groups.

The Sierra contains one epecies with single leaves—*Pinus monophylla*—the "nut pine" of the Nevada slope; one epecies with leaves in pairs—*P. contorta*—the so-called "California tamarack;" three epeciee with leaves in threes—*P. ponderosa*, the "yellow pine;" *P. sapiana*, the "foothill" or "gray-leaved pine;" and the *P. tuberculata*, or little "ecrnb pine." Lastly, there are four epecies in the Sierra which have their leaves in fives, and they are also very short. These are *Pinus Lambertiana*, the famone "sugar pine;" *P. monticola*, the "mountain" or "white pine;" *P. Balfouriana*, "Balfour's pine;" and a variety of *P. flexilis*, the "dwarf alpine pine."

Largest of these species is the splendid eugar pine, a noble tree, specimens of whicb are found often 12 to 14 ft. in diameter and over 200 ft. high. It is a peculiarity of this tree snd of the nearly related "mountain pine," that the largest limhs are at the top, from the ends of which the large cones depend, like Chinese lanterns.

The most ahundant pine is tbe yellow or pitch pine, a polymorphous species, which is distrihuted well over the mountains of all the coast and eastward as far as the Rocky mountains. So diverse and apparently distinct are its varieties that half a dozen names are given it by lumhermen, and also soientiste have made threo species out of it. A great deal of examination has been given to the forms of this species lately, and the variety, *Jeffreyi*, found on the high slopes, especially of the eastern eide of the Sierra, has lately heen declared by Dr. Engelmann to he distinct.

Tbis tree normally has but three leaves in a fascicle, hut in '75 I found a tree in the Sierra that hore ite leaves in fascicles of fives, aod it was sent to the Centennial. And thie leads to an important etatement I am about to make.

The Alleged New Pine.

The so-called new species, *Pinus Arizonica*, of Engelmann, we helieve is but a sport of *P. ponderosa*, or "yellow pine." The species is founded on specimens collected and observatione made hy Dr. Rothrock, in 1874. He found growing on the Santa Rita mountaine of Arizona a tree called by the lumber dealers "yellow pine," and which resembled etrongly in its cone, *P. ponderosa*, but which had its leaves in fascicles of fives. Other slight differences were noted also by Dr. Engelmann, to whom the epecimene were enhmitted, and he writes: "This eeeme to be a meager acconnt to fonnd a epeciee npon in a genne so difficult ae *Pinus*, but I find it impossihle to nnite it with either of the allied epecies."

Last Septemher, while the Census Commiseion of Foreetry, including Dr. Engelmann and Prof. Sargent, vieited thie coaet, they went down to Arizona and paid a visit to the Santa Rita mountains. From ahundant epecimens and examination at leisure, they come to conclueione confirming the new species.

Now, we have jnst returned from a botanical tonr through Arizona and New Mexico, and fortunately we were enabled to explore quite thoroughly a neighboring range to the Santa Ritae; that is, the Santa Catalina mountains, about 50 miles north of the former range. Botanically epeaking, the Catalinas are moet interestiog, for their eteep, eplintered peaks, arranged in two eeriee, which inclnde a large park of denee forest hetween them, afforde, perhape, more speciee and varietiee of flora than any region of the south. Here, in thie beautiful, high deer park, we found, secluded from the scorching deeert winde, a dozen epeciee of rohnet treee, including the *Pinus ponderosa* in every variety of growth and appearance. Some treee hore only their leavee in threes; some in fivoe, and eome bore fasciclee varying from two to eeven. The conee also preeented a wide diversity.

To be eure, this forest is not the one in which the original *Arizonica* was found, bnt five-leaved epecimens which I lately sent to Dr. Eogelmann, he reports ae certainly the new epeciee, and I am juet ae *sure* that conneoting forme unite it with unmistakable *ponderosa*.

The Doctor separates the species by very abstruse distinctions based upon a careful microecopical examination of the leavee. Thne: "*Ponderosa* (with other epscies), leavee in threes, sometimes in fours and fives; their sheaths persistent; strengthening cells under the epidermis around tbe resin ducts. *Arizonica* (with other epecies), leaves in fivee. Ducts usually free of strengthening cells."

Of course, auy character, if it is even *microscopic*, which is *permanent*, is therefore *distinctive;* but it will be seen that in *Arizonica* the ducte are only "*usually*" free from strengthening cells. To most botanists, other charactere hased upon differences of frnit, growth, timber, as well as appearance, would be necessary for eetablishing a eeparable form—a distinct species.

The Sierra Pines Again.

Returning from this diecussion, let us look again at the pines of tbe high Sierra in detail, ae they engage the eye of the lover of natnre. Some of the most beautiful effecte are prodnced at eeveral placss in the high Sierra hy helts of trees of different shadee succeeding each other like circular capes, on the slope of high peaks, like the Lyell group, near Yosemite; Mt. Tellac, near Lake Tahoe; Lassen's peak and the peerless Mt. Shasta, at the head of tbe Sierra. When, added to these in tbe autumn season, groves of deciduous trees, as oak, maple, poplar and willow, line the canyons which cut acrose these belts vertically, and thus, by their rainhow tints, deck the circular capes with dashes of yellow, crimson and hrown, the effect is exquisite beyond description.

For keen perception of distinctive characters and artistic descriptions, with a certain lovely, nnique mode of expression, no one exceeds John Ruskin. Happily, he has turned his attention toward the very ohjects mostly treated of in this essay—the pines. Hence, I cannot hetter close than hy quoting a few of his paragraphs, in which I have taken the liherty of changing a few sentences.

It sbould be understood tbat until lately all the cone-bearing trees, including the fire and epruces, were called pines, and some of the trees treated of by Ruskin were no douht epruce.

"The pine, placed nearly always among scenes disordered and desolate, hrings into them all possihle elements of order and precision. Low-land trees (as oak, ash, poplar, and the like) lean to this eide and that, thongh it is but a meadow breeze that bends them, or a bank of cowslips from which their trunke lean aslope. But let storm and avalanche do their worst, and let the pine only find a bit of vertical ledge of rock, or even a cleft in the face of an almost perpendicular rock, it will nevertheless grow straight toward the zenith. Suspend a plumhline along its trunk, the plummet ehall point to the center of the earth as long ae the tree lives.

I wish the reader to fix his attention for a moment on tbese two great characters of the pine—its straightnese and its rounded perfectness—both wonderful and in their issue lovely, though they have hitherto prevented the tree from heing drawn. I say, first, its straightness; hecanse we constantly see it in the wildest scenery, and we are apt to remember only as characteristic, examplee of it those which have heen disturbed hy violent action or disease. Of course euch accidents are frequent. The soil of tbe mountain is subject to continual change; perhaps the rock in which the tree is rooted splits in frost and falls forward, throwing the young stems aslope. But eventually the pine riees heavenward in serene resistance, self-contained and triumphant."

With regard to its other chief character, the perfection of its rounded spire, Ruskin says: "The impression on most people's minds must have been received more from pictures than from real inspection of the tree—so ragged and nnsightly they think the pine; whereas, ite chief character in health is rich greenish and full roundness. It stands compact like ooe of its conee, slightly cnrved on its eides, finished and qnaint like a ehorn tree in a nohleman'e park, and instead of being wild in expression, forme the eofteet of all foreet ecenery, for other treee ehow their twieting etems and boughs; but the pine, growing either in luxuriant mace or in happy isolation, allowe no wood to he eeen. Summit hehiud eummit riee ite pyramidal ranges, or down to the very graee eweep its circlet of boughe. So there is nothing hut green cone and green grass. Nor," he adde, "ie the pioe eofter, but in one eense more cheerful than other foliage. The treee of lowlsnd forests, as the oak, ash, maple, etc., interlace their branchee overhead and checker the earth with darknese, hnt the pine, growing in scattered groupe, leaves the gladee hetween emerald hright. Ite gloom ie all ite own; narrowing into the eky it lets the sunehine etrike down to the dew hetween ite long-pointed ehadowe."

A WELL-DRILLED MAN.—Patrick Mulligan, who has heen in the hospital for ahout three weeks, wae yeeterday eufficiently recovered from hie injuries to appear on the etreet, and ie confident that within a few daye he will he ahle to reeume work in the mine. No other man in Montana can eay that an eight-ponnd two-ft. inch drill ever passed through his hody. Not one man in a million could experience the sensation and live to tell ahout it. Mr. Mulligan eete a great value upon the drill, and proposee to keep it ae a memento. Soon after the accident occurred, and when he first knew there wae a poeihility of eaving hie life, he expreseed the eomewhat eupereti tioue helief that if the drill were polished and preserved he would ultimately recover. To gratify the hnmor, the hoye at the mine have every day devoted a little time to the polishing of the drill, and it ie now as bright and glistering ae a new eilver dollar, and Mulligan is well.—*Butte* (Montana) *Inter-Mountain*.

Gold Park Mines.

A New Mineral Belt.

Every day new districts are being found in Nevada. One of the latest and, probably, the richest of these latter is Gold Park in Nye county, Nevada. A correspondent of the *Bonanza* says, I journeyed for miles from Grantsville along the foothills, passing the dormant town of Ione and sagebrush. After six hours of easy riding I reached the mouth of Gold Park canyon, which is somewhat narrow, with steep mountains on either side heavily timbered with gigantic pines. Following the road through willows, poplars and currant bushes I finally came to a wide and beautiful basin, fresh and green, the whole reminding one of the beautiful scenery of California. My interest was strongly attracted to a lovely spot resembling a park from which it derives its name. My energetic and enterprising friend, Mr. San Pedro, has recently erected a boarding-house close by a couple of springs of the coldest and purest water.

The Mineral Belt

In this district is about seven miles long and three in width, running north and south, and contains porphyry, syonite, some lime and quartzite; but porphyry and syenite predominate, the former showing always on the foot-walls of the mines. The ledges run parallel in groups, generally three in each, from 25 to 50 ft. apart, running northeast and southwest, varying in width from one and a half to eight ft., inclining to the east at an angle of from 40° to 50°. The ore is of a decomposed quartz character, very soft and carrying some lead in a carbonated condition; also some copper and iron and gold and silver. By carefnl averages taken from these mines it is safe to say that the ores in this district will mill $60 per ton without asserting; $45 in gold and $15 to $20 in silver. The ores are free milling and the small percentage of lead being of the oxide of carbonate order will not do any harm to the process of wet crushing and pan amalgamation. The gold is so free that a small lot of this ore worked in San Francisco on plates gave a good result, but pans will be the best. By the latter process ore worked in Grantsville in small lots gave a result of $4.50 tailings, when the pulp assay was $185 in gold and $15 in silver.

The Gold Park Mining Company

Is running two tunnels. The first I visited is the one running for the Arctic group of ledges. This tunnel is being run from the east side of the hill and is now in 191 ft. It has passed through two of the ledges. The first is from two to two and a half ft. in width and averages about $70 per ton, almost all gold only $10 being silver. The second is smaller and carries less pay. They are now about to strike the Arctic. This ledge has an incline 60 ft. in depth and the ledge is four ft. wide. This is the west ledge, and when tapped will be (owing to the steepness of the hill) 175 ft. from the level of the tonnel to the croppings, and I must mention here that the pay ore goes to the surface. The next tunnel is on the

Star of the West

Series, also started from the east side of the hill and is now in 113 ft. having passed through two ledges. The first is about two ft. wide, of decomposed quartz, giving an average of $85 in gold and $12 in silver; there is little or no lead or base of any kind in this ledge. The next one is smaller and as in the other tunnels not quite so rich as the first.

The Star of the West No. 1,

Which lies farther west, has an incline of 50 ft. and averages three ft. from top to bottom. This is the richest of all, averaging $120 in gold and $15 in silver. Directly opposite this mine, on the west side, is the San Francisco group or series, running and pitching the same as the series on the east side.

The San Francisco

Has a 75-ft. incline and in the bottom an eight-ft. ledge of free milling ore, but of a low grade, averaging about $20 in gold and silver.

The Sacramento

A little farther to the north shows large croppings with bunches of rich gold and silver ore; but little work has been done in this mine to determine its real value. My opinion is that this is the same mine they have in the bottom of the San Francisco incline.

The California

Is another of these series or groups, but no work has been done on it. The Gold Park mining company is the owner of several more ledges on this hill but no work has been done on them as yet. The intention in future is to keep ahead with the Star of the West tunnel, and by running 700 ft. will tap the San Francisco series at a depth of 600 ft. They have secured all the best mines with three United States patents, also own the town site and water right. Wood, of which there is an abundance, will, when they are ready to start a mill, not cost over $2 a cord delivered. With these facilities the ores can be worked in this district by wet crushing at a cost not to exceed $5 a ton.

There are several other good prospects in this district farther to the south on the same belt, but as I have not seen them I can say nothing in regard to them.

I left with the favorable impression that the mining district will undoubtedly prove to be one of the most prominent gold and silver producers in Nevada.

Useful Information.

Queer Bread Materials.

Earth bread is made from a white earth in Upper Lusatia, formerly a part of Germany, but now under the rule of Prussia, and the poor of that region use this bread in times of scarcity. The earth is dug from a hill where saltpeter was once manufactured. When laid in the sun until heated, it cracks, and globules like meal exude from it. These are mixed with a little flour and soon ferment, and is then baked. It is supposed that the saltpeter or soda in this earth gives its lightness.

Something similar to it is found in Catalonia, and is also used for bread. It is affirmed that in cases of extreme need, many have lived on this bread for weeks without experiencing any injury. Soft stones were ground and made into bread in the late famine in India, to prolong, if possible, the lives of that stricken people. Fish bread is still used in Iceland, Lapland, Crim-Tartary and other places far north. The fish is first dried, then beaten to a fine powder; and sometimes the inner bark of some of the trees of that region is mixed with it, and then wet and made into bread and cakes. Moss bread is manufactured in Iceland, from the reindeer moss or *lichen rangiferinus*, which, toward the month of September, becomes soft, tender and damp, with a taste like wheat bran. This moss contains a large quantity of starch, and the Icelanders gather it in the latter part of the summer season, thoroughly dry it, then grind into meal; and bread, gruels and pottages are made with it. The want of better grain frequently compels the poor Icelanders to bake a kind of bread from the seeds of the sand-reed; *elymus arenarius*, which on their shores are merely eaten by the birds of passage.

Cheap Tinware.—Now, a word or two about cheap tinware. You needn't expect to get a dish-pan for 20 cents that's worth 60; they don't grow, and if they ever did, the tree is dead and the seed lost. When you buy a pan for 20 cents, depend upon it, it's only worth 20 cents. The iron of which it is made is of an inferior quality, brittle and rotten; it won't stand bending; the tin with which it is covered is nearly all lead, and there's very little of it, anyway; and it will wear off, and the iron rust through in a few weeks, while a 60-cent pan, made of good charcoal iron, and covered with pure tin, and plenty of it, will last you for years. Dealers keeping this cheap trash should always have the good also, and explain the difference to every customer. You'll lose a sale occasionally, because some unscrupulous fellow will swear by everything that's lovely that his "dwenty-cent pan is shoost the best vot ever vas," but you'll gain in the long run; you'll sell more good ware than had, and you will have a name that is better than great riches.—*The Enterprise.*

A New Product from Birch Bark.—A French inventor has recently patented a method of improving India rubber and gutta-percha by the addition of a distillate of birch bark. By distilling the outer layers of the bark he obtains a dense, black, gummy matter which possesses the properties of ordinary gutta-percha with the additional quality of resisting both the action of air and the strongest corrosive acids. He claims also that by adding a small proportion of the birch bark gum to gutta-percha or to India rubber (one-twentieth part will suffice), the durability of the rubber or the gutta-percha will be greatly increased, the new mixture not being acted upon by the air or by acids.

Sharpening old Files.—The edge produced on files by acid does not hold; a recut file differs from a new one in temper, as drawing and replacing the temper injures the steel, the original temper seldom being attained. The only method of sharpening a file and making it as good as new, is by the application of the sand blast. I have been using this in my shop about six months, and can sharpen an old file equal to new (without disturbing the temper) in from one to three minutes. I prefer old files thus treated to any new files, as it makes them keener and smoother cutting, and prevents breakage of teeth.—*Blacksmith and Wheelwright.*

Holes may be bored in porcelain by means of an ordinary machine drill. The drill is kept moist with oil of turpentine, and caused to revolve rapidly by taking one twist of the string of a bow about, and drawing the bow quickly backward and forward, after the manner of using a saw, while the head of the drill is held in position by a loose oiled brace.

Perfumed Camellias.—A gardener at Naples holds out the hope that in the near future the camellia will rival the rose in fragrance as well as in beauty. After years of experience he has succeeded in producing a camellia with a delicate perfume. It is of a pale rose color, and the gardener hopes to obtain before long fragrant white blossoms.

To remove putty from broken windows dip a small brush in nitro-muriatic acid or caustic soda (concentrated lye), and with it anoint or paint over the dry putty that adheres to the broken glass and frames of your windows; after an hour's interval the putty will have become so soft as to be easily removable.

The Grease Tree of China.—Mention has been made in these columns of the value of the grease tree of China as a lubricant. It is said that large forests of this vegetable lubricant are to be found there, and they form the source of a considerable local traffic. This tree not very long ago was imported into India, and it is said that the experiment of cultivating it there has proved quite successful. In the Punjaub and northwestern provinces generally, it grows as rapidly and vigorously as in the native soil, and there are already thousands of trees on the government plantations yielding tons of seeds, admirably adapted to a variety of commercial purposes. Dr. Jameson, a chemist in the Punjaub, has prepared a quantity of grease from this tree, and has forwarded on trial a portion of it to the Punjaub railway to have its qualities tested in a practical manner as lubricating matter for those parts of the machinery constantly exposed to friction. The grease thus obtained forms an excellent tallow, burning with a clear, brilliant and, what is infinitely more to the purpose, a white light, and at the same time emitting not a trace of any unpleasant odor or of the ordinary disagreeable accompaniments of combustion.

To Make a Clear Caoutchouc Solution.—Perhaps the following recipe will be of service to some of our readers: Prepare a capacious linen bag, in which place about an ounce of finely chipped caoutchouc. Suspend this by a thread in a flask containing about a quart of benzine, in such a manner that the linen bag is held near the surface of the liquid. The soluble portion of the gum—about 40% to 60%—will be dissolved out in the course of about a week, and will pass into the benzine, forming a clear, limpid, but viscous liquid, containing about 1¼% of caoutchouc. The linen bag with its contents, now enormously swollen, should then be withdrawn and the clear liquid poured off into a suitable bottle tightly stoppered, and kept in the dark, as it shows a tendency to decompose on exposure to the light. The swelled contents of the bag containing the residue of the gum may be utilized for the preparation of an inferior grade of caoutchouc cement or varnish, by the addition of more benzine.

Good Health.

Unfavorable Effects of Irrigation.

The city of Ismailia was built up upon the banks of the Suez canal immediately after the construction of that work. It was supposed that the new city would immediately come into notice as a place of health resort. No one ever expected that a newly founded city, in what was little more than the open desert, with a fine fresh breeze blowing over it daily, would be otherwise than a sanitarium, but it was soon found to be quite the reverse. Many have tried to find out the reason why Ismailia should be so unhealthy, but the reason generally given is this, that the new city having now a fresh-water canal from the Nile running close by, the sandy soil has got thoroughly saturated with water by filtration, and also from irrigation of gardens at Ismailia (not to speak of decayed vegetable matter lying about here and there), so that the evaporation through the soil is immense, and such an unhealthy atmosphere breathed night and day by the inhabitants, who generally live in houses of only one story, and remember, in almost a tropical climate; all this combined seems to have produced the serious Dengue fever, which has of late raged there and compelled the Court, with many of the former residents, to remove to Mansoura, on the bank of the eastern branch of the Nile. Of course, M. Lesseps is much grieved at such an exodus from his pet city of Ismailia; and the Suez canal employees there, who form the bulk of the inhabitants, have lined the fresh-water canal with cement, to keep the water from saturating the soil as formerly; and the cultivation of cabbages and other vegetables which were grown so freely under a copious artificial irrigation has been discontinued.

Dangers of Anæsthesis.—The Cincinnati *Lancet* considers that the condition of artificial anæsthesis, no matter by what agent produced, is always a condition of danger. The term is somewhat vague, too much so indeed for strict reasoning. We may say that travel on a railroad always constitutes a condition of danger. We agree with the *Lancet*, however, in the general expression. The truth is that anæsthesis is really partial death. It is a suspension of one of the most important functions of life. Although we have witnessed the condition with countless frequency during all the long years since the introduction of ether, yet we must confess that every instance of anæsthesis still brings to mind the idea of death, and produces the impression that the patient is pushed so near to the grave as to suggest the possibility that he will not return.

Hot Water in Anæsthesis.—In a letter to the *Lancet*, Dr. A. Paggi records the following observation: He states that in Paris he saw a case in which, under the inhalation of chloroform, the heart ceased to beat, and artificial respiration for ten minutes to restore circulation, when Dr. Labbe dipped a large cloth in boiling hot water and applied it to the region of the heart, with the result of immediately restoring the action of the heart.

Mortality of Brakemen.—The brakemen on our railroads find it quite difficult to get their lives insured. It is estimated that there are at least ten brakemen killed throughout the country every day while coupling cars and making up trains, or are knocked from the top of the cars by bridges, or slip or fall, or are injured or killed in collisions. Then there must be at least three times as many injured as are killed, of whom the public get no account. If 10 brakemen are killed every day, that would be equivalent to 3,650 during the year, which, added to the number injured in various ways while on duty, would give the sum total of deaths and injuries about 14,600 a year. These are frightful figures of a fatality, a loss of life, or injury to the body. The public has no idea of the number of accidents that occur on the various railroads throughout the country every day. There is no vocation so fraught with danger to life and limb as that of the brakemen on our railroads, particularly on freight trains. Indeed the life of a brakeman is a precarious one. Some insurance agents in some parts of the country do not take risks on employees on freight trains; but conductors and brakemen on passenger trains, where there is less danger, are insured by their paying an extra per cent. Railroad men say that only about 25% of the brakemen of freight trains die a natural death, also, that the average life of the brakeman, after he goes on the road is about 10 years.

The Meaning of Dreams.—Lively dreams are, in general, a sign of excitement of nervous action; soft dreams, a sign of slight irritation of the brain, often, in nervous fevers, announcing the approach of a favorable crisis. Frightful dreams are a sign of determination of blood to the head. Dreams about fire are, in women, signs of impending hemorrhage. Dreams about blood and red objects are signs of inflammatory conditions. Dreams about rain and water are often signs of diseased mucous membrane and dropsy. Dreams in which the patient sees any part of the body especially suffering, indicate disease in that part. Dreams about death often precede apoplexy, which is connected with determination of blood to the head. The nightmare, with great sensitiveness, is a sign of determination of blood to the chest. "To these," says Baron Von Fechterlehen, "we may add that dreams of dogs, after the bite of a mad dog, often precede the appearance of hydrophobia, but may he only the consequence of an excited imagination." Dr. Forbes Winslow quotes several cases in which dreams are said to have been prognostic: Arnaud de Villeneuve dreamed one night a black cat hit him on the arm. The next day an anthrax appeared on the part bitten. A patient of Galen dreamed that one of his limbs was changed to stone. Some days after his leg was paralyzed. Hippocrates remarks that dreams in which one sees black specters are a bad omen.—*Dr. Hammond in Druggists' Circular.*

A singular surgical operation was recently performed upon a well-known St. Louis real estate agent, in which a pound of adipose tissue was taken from the back of his neck. The patient is a very large man, whose weight is 249 lbs. The fat had begun to gather in such heavy folds about the neck as to become a source of constant annoyance, the head having been crowded forward and held in an unbecoming position. The skin was divided at right angles, so that the wound made a sort of cross, from beneath which all the underlying fat was taken. The piece of flesh is said to have weighed exactly one lb. The patient took nothing to sustain him in the trial, and did not appear to suffer much, even when the parts were being cauterized, to prevent a formation of new tissue. The wound being closed up and bandaged, he lighted a cigar, ordered the pound of flesh to be thrown into the sewer, and sat quietly down to read the paper. Only a few drops of blood were lost, and no serious consequences are expected. The patient was not prevented from taking his usual morning walk, and expected to be able to attend to his usual business within a week from the time of the operation.

Fear of Disease.—It is said that while the plague was raging in Buenos Ayres, the gravediggers bore charmed lives. Of the 300 men so employed not one died of the disease. It has often been noticed that during the prevalence of pestilential diseases, physicians, undertakers, nurses and grave-diggers, whose business compelled constant liability to infection, have usually escaped in a far greater ratio than their numbers would warrant. The "charm" of this immunity from the prevailing scourge is very simple. They are not *scared*. They are *positive* to the disease, and repel its attacks. *Fear* is a great ally of death. Whoever is afraid of disease is in a *negative* condition and really invites its approach. And thus it is the world over. The brave die but once, while cowards die many times. Much unnecessary alarm exists in every community in regard to many diseases. We are, it is true, all liable to sickness and death. But if we are all sober, cleanly and brave of heart, we need have no fear of disease of body or mind.—*Golden Rule.*

In cases of sprains, says a medical writer elevate the limb, keep the joint perfectly quiet, apply luke-warm lotions or fomentations. When inflammation has ceased, apply stimulating liniments and bandages; shower the parts with cold and warm water alternately.

MINING AND SCIENTIFIC PRESS

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SAN FRANCISCO:
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Passing Events.

The Mechanics' Institute fair is now in full blast, and is considered a pronounced success in every respect. The building is well filled with interesting objects, and the attendance is large. These annual fairs are of great advantage to the industrial interests of the coast, which are now progressing at a rapid rate. From the mining regions in every direction we hear of rapid progress. In Idaho there is just now more excitement than elsewhere. The Wood River miners now have several smelters to help them out and more are being put up. The Sawtooth mines are also doing well, and new mines are being found every day.

Arizona still continues to show up new mines; but more new ones are being found than old ones developed. Capital is badly needed down there to develop the really valuable resources of a rich country. New Mexico is now attracting from the East, capital toward its mines, and within the next year or two we may expect many new developments.

As to mining dividends, a point is to be noticed in favor of this State. In looking over the dividends for six months, which we published last month, it is found that California still heads the list, somewhat to the surprise of many who supposed that Arizona, Idaho, Montana, Utah, Nevada, and particularly Colorado, were ahead of the "Golden State." We do not advertise our mining resources as much as some others, as it is an old song with us, and we go on steadily about our business. Some of our neighbors, however, with more mines than dividends, make as much talk as if they needed a mint.

POWDER EXPERIMENTS.—The Touite Powder Co. will give an exhibition of their product, at the works to-day (13th). The train will leave from Oakland ferry at 9:30 A. M., returning at 2:27 P. M. We shall give the results of the experiments in the next number of the PRESS.

Boiler Explosion Test.

Steam boilers are always tested before they are set up, to prove that they are capable of withstanding a certain amount of hydraulic pressure, which is much more than the steam pressure to which it is proposed they shall be subjected when in practical use; but we have never, until the present instance, heard of an experiment, wherein a boiler was subjected to a steam pressure up to its bursting point, for a purely experimental or scientific purpose. Many theories have been put forward as to the cause of the bursting of boilers, when all the conditions have been such that, under the eye of the most careful and skillful engineer, there would seem to be no known reason for such a casualty. Yet such explosions frequently occur, and as a general thing they are the most violent and destructive of that class of casualities. The theory which of late has been the one most generally received, ie that which we believe was first suggested some 25 years ago by Tera Colburn, and which is known as the percussive or concussive theory.

The substance of this theory is, that when the water in a boiler is perfectly at rest, that is, when there is no circulation among the tubes or along the heating surfaces, the water in immediate contact with those surfaces receives an undue charge of heat, which it retains in a latent or quiet state as superheated water, and as quietly transmits the same, until nearly the whole body of water is thus overcharged with heat.

As an illustration, we may cite the well-known experiment of gently heating a body of water covered with a coating of oil in an open vessel, until it reaches a temperature considerably above the boiling point, when, by dropping any small object, like a key or a small pistol ball into the same, a large portion of the water will be instantly converted into steam, with an explosive force sufficient to throw nearly, or quite all, the water from the vessel. The oil, in this case, prevents the circulation and consequent escape of steam and heat which would otherwise be set up.

In a steam boiler at rest with all the valves closed, Mr. Colburn held that this condition might be carried to a much greater extent; so far that, when a large valve is suddenly opened, and the pressure thus removed, the water is as suddenly converted into steam, and with quite as much energy as is manifested by the liberation of the gases confined in a mass of gunpowder when a coal of fire is applied to it, and in either case, no practical amount of pressure will withstand the explosive force.

"When water is thus superheated, the engineer opens the cylinder port, and instantly the steam fills the cylinder, creating a vacuum to that extent over the superheated water in the boiler, a portion of which bursts into steam to restore the reduced pressure, instantly striking every square inch of the boiler with a concussive force many-fold greater than the regular pressure of the steam, and consequently the numerous explosions that occur just as the steam is turned into the cylinder at starting, and before its passage from the boiler has become uniform."

It was to prove the correctness of this theory that Mr. D. T. Lawson, of Wellsville, Ohio, recently undertook the experiments alluded to above, by which he exploded a boiler under a pressure much lower than it was capable of resisting by merely allowing the steam to escape from it by suddenly opening a large valve. At the first trial, the valve was opened at a pressure of 365 lbs., when the pressure was suddenly reduced, but no explosion followed. The water had not reached the proper temperature. The next time the pressure was allowed to reach 380 lbs., when, touching the lever, a rush of steam was distinctly heard, which was instantly followed by a terrific explosion, which tore the boiler into almost innumerable fragments—the plates being ripped into shreds from the size of "a dollar bill to that of a saddle girth." The boiler had previously been tested at an hydraulic pressure of 604 lbs. Mr. Lawson and his party were snugly ensconsed in a "bomb-proof" when the valve was opened.

There need be no wonder at such an effect when the reader calls to mind the fact that the transformation of water into steam calls for 1,700 times increase of space. When this is done by creating a vacuum suddenly, as is the case when a large valve is suddenly opened, or a large quantity of cold water quickly thrown into a heated boiler, the impact and pressure of the particles of steam upon the confining walls can no more be resisted than can the impact of the gases resulting from the explosion of gunpowder.

When there is reason to fear that the water in a boiler has thus become superheated, the only safety is to discharge the steam by very slowly opening the valve to the cylinder, and thus allow the pressure to be removed in such a gradual manner that no sudden impact or concussion can be produced upon the interior walls of the boiler. Every one is familiar with the percussive effect of water, and even a very inconsiderable head, when an ordinary faucet is suddenly opened. The action of steam is still more powerful and violent.

Mr. Lawson also has a theory in regard to the prevention of explosions, which provides for an arrangement for preventing the sudden reduction of pressure in the boiler. The arrangement consists in a boiler constructed with a partition between the flues and the top of the boiler, thus creating a steam compartment over the water compartment, the former to be supplied with steam from the latter through valves in the partition, which valves, to insure safety, must have less area in the aggregate than the area of the port or valve through which the cylinder is fed from the steam compartment. By this arrangement, argues Mr. Lawson, the pressure is kept approximately uniform upon the surface of the superheated water, thus preventing the dangerous concussive force which must always follow a sudden reduction of pressure. Mr. Lawson will soon make experiments with such a boiler with the view of demonstrating that it cannot be burst, the result of which will be awaited with much interest.

The Gold Bluffs and Gold Beaches on our Northern Coast.

More than 31 years have now elapsed since the first discovery of gold in the beach sands on this coast. This occurred at Gold Bluff in 1850, and led to the excitement which, the following spring, carried a great many people to that point. Although the most of these adventurers were disappointed in their expectations, the existence of gold in considerable quantities at that locality was not altogether a myth. The precious metal was there, but it existed in a form and under conditions that made it impossible for these people to gather it with profit. So, after a few fruitless attempts at working these deposits, the business was abandoned, the most of these Argonants returning to San Francisco, whence they came, a few having made their way farther up the coast, or crossed the mountains to the mines on Trinity river, then just beginning to be heard of.

The trouble with these beach deposits was this: The gold which the surf threw up and exposed to view at one time, was covered with masses of barren sand or swept wholly away at another, its stay being too brief to permit the waiting crowd, ill-equipped for the purpose, to secure more than an infinitesimal portion of it at any one time. Then, but little of the gold that the sands contained, could, by reason of its fineness and its being coated with some greasy or gaseous substance, be saved. And so Gold Bluff was, for the time being, pretty much deserted, and its name afterward classed with the traditionary humbugs, of which there were all too many at that day.

But there were those who entertained the belief that where there was so much gold, means could be devised for saving at least sufficient to make the collecting of it remunerative. Of these hopeful ones enough remained to form several small companies who pursued here the business of gold gathering with tolerably good results. These parties having stopped at the original Gold Bluff, and secured there some of the best paying portions of the beach.

In course of time, however, the whole of the beach lying in front of this bluff, some eight miles in extent, fell into the hands of two companies, the one composed of two members, Greenhaum & Chapman; and the other of some six or eight persons, all practical miners. These companies adopted the plan of gathering at low tide the richest portions of the sand, and packing it on animals up beyond the reach of high water, and there washing it in sluices. As each of them owned about four miles of the beach, it seldom happened that they failed to find after a heavy surf, with a favorable wind, some rich sand at one point or another along this stretch of beach, and having grown expert at detecting these deposits when present, and being withal well provided with the means for securing and removing them, these companies made the business pay handsomely. But the locality being remote and difficult of approach, vessels of any kind rarely ever touching, and making no regular landings there, only at long intervals have we been able to hear much about the operations of these companies, little exact information on the subject having, in fact, ever reached the public ear.

From Mr. Allen Heald, of Oakland, who is familiar with this class of deposits, and who, not long since, visited Gold Bluff, traversing the beach thence north, we have some recent and reliable information from this isolated but interesting section of our gold fields. Touching the history and operations of the two companies mentioned, it seems that they or their successors are still the only parties extensively engaged in gathering and washing the auriferous sands at or near the old Gold Bluff.

The Greenhaum company still consists of the two members who originally composed it. The shares of the other company having been bought up by Richard Furnald and Solomon Hall, this property was afterward sold to Adson Adams, the real estate millionaire, of Oakland, Mr. Heald having examined the ground and negotiated the sale on behalf of Mr. Adams, who is now its sole owner. Each of these estates yields on an average about $40,000 per year, of which something like 65% consists of net profits. As Mr. Adams paid but $50,000 for his purchase, he naturally considers the bargain a good one. He has since been offered $100,000 for the mine, but declined to sell at any such figure, believing it a good legacy to leave to his children. Not only so—he finds the locality a pleasant summer resort, and is, at this time, sojourning at Gold Bluff with his family.

The manner of conducting the business of gold gathering at this point is as follows: After a heavy surf the Superintendent of the mine rides along the beach as the tide begins to ebb and carefully notes the condition of the sand, watching for evidence of gold having been thrown up by the waves. If he discovers that fresh deposits have been made he signals the muleteers to that effect, who then rush down their animals and pack out as much of the auriferous sand as possible before the tide again comes in and puts a stop to their work, covering up perhaps the rich streak with a heavy layer of barren sand or possibly sweeping it away altogether.

It is a singular circumstance that when the surf comes square on the beach the gold brought up by it is covered under several feet of this barren sand and, that only when the surf strikes the beach at some other angle, is the gold left on the surface where it can be seen and readily gathered. After being so collected, this rich sand is washed in sluices, small streams of water having been brought in for the purpose. For saving the gold only copper silvered plates are used in the sluices, which are usually run with a light head of water.

On the border of a small lagoon on the Greenbaum ground a short distance back from the beach occurs a large body of low-grade sand. This is run out on cars and washed in an old fashioned "Jenny Lind" tom, being a sluice of one box widened out and supplied with a screen at the lower end.

At one time it was thought that this gold was brought up out of the ocean, an opinion that some people still entertain. But this is clearly a mistake. It came from the bluff in the rear, which is made up of alternating strata of clay, gravel and sandstone. The gravel strata, three or four in number, being all more or less auriferous. The action of the waves has broken down this bluff, which varies from 100 to 500 ft. in hight, and released the gold; the latter having afterwards been by the same agency carried seaward at least as far as low water mark. After a very heavy surf breaking down, as sometimes happens, a portion of the bluff, the beach below is sensibly enriched, the gold by this new addition being rendered somewhat coarser than before.

This fact has suggested the utility of employing powder for breaking down and disintegrating these banks, an agent that will, no doubt, some day be used for that purpose. While the sand along this beach must, under such steady and long-continued working, necessarily suffer a gradual impoverishment, this latter has not, as yet, proceeded far enough here to sensibly affect practical results, a fact due, it may be presumed, to the great width of the beach at this point and to the replenishment which the stock of workable material is constantly receiving from the caving down of the banks above. Farther north, where these favorable conditions did not exist, the gold-bearing beaches have been so nearly exhausted, that hardly any work is now being done, where, from 15 to 25 years ago, thousands of men made good wages.

That the sand, which is constantly covered by the sea, is not very rich has been proven by the trials made on it some years ago with steam dredgers, none of which found gold enough in it to warrant a continuance of these operations.

Each of the companies above mentioned employ from 10 to 12 men and about 18 pack-animals the year round. Operations are kept up with but little interruption, the men being engaged a good part of the time, either in gathering sand or washing it. What time they are not so employed is devoted to cultivating a patch of land in the neighborhood, on which the companies raise some fruits, hay and vegetables for their own use.

Adjoining the Adams claim, which covers the upper or northern half of the beach, a small company is washing these sands by the hydraulic method, using a limited amount of water under a pressure of 80 or 90 ft. From this point north, clear into Oregon, a distance of 30 or 40 miles, very little in this line of mining is being done, though this was at one time along miles and miles of the beach in the vicinity of Whisky Run and the Coquille rivers, an active and profitable industry. Here and there a small company is still to be seen re-working the sands that have already been washed, in some instances several times over, and always with remunerative results, the first one or two washings having generally paid very large wages.

From Mr. Heald, who is himself an experienced, successful miner, we learn that the present has been a prosperous year with hydraulic miners along both the Trinity and Klamath rivers, notwithstanding the water season there, as elsewhere throughout California, has been a very short one. Owing to its freedom from the vexatious debris question and to the presence of good conditions generally, that region of country is strongly attracting the attention of capitalists and others inclined to invest in this branch of mining. Besides great quantities of good gravel, the Klamath country is especially well situated as regards water, which is not only abundant but can be brought upon the mines at small cost and under great pressure, the mountains, the sources of the supplying streams, rising to a great hight directly over the mines. That but little trouble is encountered there from high rim-rock or cemented gravel, may be inferred from the fact that no hauk blasting has ever been practiced nor has a single bedrock tunnel of any length ever been driven in Klamath county; and this, notwithstanding hydraulic mining has been carried on there extensively and successfully for many years. For these and other reasons it costs comparatively little to open up and run a mine of this kind anywhere in this northern region.

A New Form of Girder.

(CONTINUED FROM PAGE 97.)

tom, and the greatest hight 10 inches. Two of 2½ inches diameter wrought iron tie rods anstained the tensile strain. Figure C shows the knuckle joint, the round cast on the center piece, and the socket cast on end pieces, and with the strut cast on same piece, thie latter resting on the bottom on the tie rods. Fig. D shows end of girder. At the top of the arch will be seen a space of 1¼ inchee. Whatever may be the deflection, no parts of the arch, excepting the knuckle joint, touch, so that compression is only exerted on the line of the hottom flange. The cross section of arch (see Fig. B), ie of the Hodgkinson form for straight girder and made to snstain a 16-inch brick wall; consequently, from its broad bearing for the wall, it is largely in excess in compressive resistance to the tensile capacity of the rods. The following is the cost of this girder in San Francisco where materiale and labor are higher than in the Eastern cities and in Europe:

Weight of arch casting, 3,080 lbs., 3½c.	$100.10
Weight of tie rods and nets, 902 lbs., 4½c.	40.59
Fitting 4 bolts and lead	5.50
Drayage and painting	3.00
	$149.19

Had thie been made to snstain 186 tons as a safe load, the breaking load, three times greater—the same casting to be nsed, but to have three of 3 inch diameter rods, it would have cost:

3,080 lbs. casting, as before	$100.10
3 3-inch rods, 1818 lbs., 4½c.	87.78
Other expenses	9.50
	$197.38
Difference	$48.19.

In the experiment at the Pacific Rolling Mills, the other day, this girder was loaded with 117 tone and 1,741 lbs. of railroad iron, the length hetween the supports. Under the weight it dcflected at the joints a quarter of an inch below the true arc. The fonndation on which the girder rested settled seven inches, so that loading had to be stopped. I have no doubt it would have oarried 225 tons, or nntil tbe rods broke. At each of the abntting ends a lamina of lead was nsed to fill in between the castinge, which were not nicely fitted, as the strength at this place wae eo much in excess of reqnirements. This was to make up for the irregular snrfaces, the draft of the pattern making it fuller in the middle in each piece. To make up for the closing np part of the lead when the compressive force was exerted, as well as to straighten the tie rods, when loaded, the arch was cambered three-qnarters of an inch at the joints above the trne arc. The same rule applies to each one of these three sections as that of a continnons arch in one piece of its length; that is, they are subject to a hending moment and a thrust force, and both compression and tension are brought into play, as that of a straight girder, but less of tension than compresion, heing of arch form, as mentioned in a previone part of this article. But it mnst he borne in mind that the compressive force exerted on each of these three short arches or sections of the long arch, equivalent to three small girders, each 7 ft. 9 inches long, is equal to the compressive force of the whole length, 23 ft. 3 inches.

While the compreesive and teneile force transversely exerted is only duo to the load on a length of 7 ft. 9 inches, therefore the compressive force to resiet the tie exerted on a single section of 18 ft. 9 inches, consisting of 8 hays, making the entire length of girder 150 ft., ie eight timee that it would be if the girder was only 18 ft. 9 inches, so by a proper nnmher of hays suitable to the length, this may be so regulated as may beet suit any desired end.

Fig. 1, 2, 3, 4 and 5 are a railroad bridge which may be made 500 ft. in length, and of a euitable number of hays. It will he seen that the top of strut is round and the ends of arch are socketed to meet the round of the strut. Provision is made to prevent the girder raieing by being loaded only on one end with a tendency to raise at the other, as that of a railroad train on the one end. This is effected by the bottom edges of casting pressing together. It will be seen that the ends of arch on ontside enclose the strut. Provision against lateral deflection is made for long spans hy widening the ends where they abnt and enclose the strut. To sustain the bridge floor wrought iron rods, or suspenders, may rnn inside or on outside of the cast iron strut, or a wall on top and floor beams laid on it.

Thie construction weighed in all its bearings Mr. Jackson thinke will be found to be much cheaper for equal strength, than any now in use. Girders of long spans for a hridge can be made as it were in a day, and taken to the place of destination and readily put together. By this mode of conetruction Mr. Jackson is convinced he has found a meane to apply for the world's use the heretofore univereally condemned cast iron, when used for long spans and snbject to cross strain, as well as overcoming the inherent fault caused by the unequal distribntion of the metal cauein weakness if not positive rupture unobservahle, made to exist hy contraction of the metal in cooling. The 25-ft. girder is in front of premiscs, 231 First St., where it may be examined. Mr. Jackeon respectfnlly invites discussion of the engineering world respecting the merits of the device described.

THE July retnrns of the British Board of Trade show a decrease in imports of £1,201,000 and increased exports of £159,000, as against last July.

Contributions to the Geology of California

New Series.—No. 5.

Occurrence of Vanadates of Lead at the Castle Dome Mines.

H. G. HANKS, STATE MINERALOGIST: The occurrence of rare mineral *vanadinite* at the Castlo Dome mines is snfficiently interesting to receive a special notice in this series, although the locality ie just beyond the line of the State, acroee the Colorado river, and in the Castle Dome district, Arizona.

During my recent visit to that district I collected a variety of specimens with the intention of preparing a full memoir npon the speeies, and its association with Wulfenite and the otber beantiful ores of the Castle Dome veins, bnt as the box containing the material hae not arrived I must bo content with sending you this preliminary notice.

Vanadinite, whicb occurs in considerable abundance in the claim known as the "Railroad," is a rare mineral, and has not hitherto been found in the United States, if we except eome minute microscopic crystals mixed with Wulfenite found in tho ores of the Wheatley mines, at Phenixville, Pa., and referred to the species Descloizite, also a vanadate of lead.

The vanadinite occure in groups of hexagonal prismatic crystals with curved sides, tapering at each end, and closely reeembling pyromorphite in form and grouping. These crystale are rarely over one-eixteenth of an inch in diameter, being generally half that size and less than three-sixteenths long. They are in confnsed aggregations, forming crnsts and filling cavities in the decomposing ores of lead, and also on fluor-epar. Some of the crystals are cavernons, presenting the appesrance often seen in phosphate of lead. One eide of a crust of crystale is often in distinct hexagonal oryetale, and the other cousists of an aggregation of minute crystals gronped in arborescent forms, and differing in color from the coarser crystals. The larger crystale are generally light brown in color, with a bronzy luster. The emaller crystals are lighter, and are of various sbades of orange yellow, becomiog in places nearly white with a eilvery satin-like lnster, due possibly to a pellicle of some other mineral covering the surface. The yellowish hrown crystals have a wax-like appearance and luster.

The difference in appearance in the crystalline crusts, their difference of aggregation and color, euggest the probability of several species. It is possible that Dechenite, Descloizite and mimetite are represented; also Eusynchite. The behavior with nitric acid is different, some crystals ehowing a distinct separation of red vanadic acid, and others giving but a slight reaction.

The Wulfenite crystals in association are extremely brilliant and light yellow in color, presenting a beautiful appearance upon a hackground of green fluor-epar, or white crystalline carbonate of lead.

There is great need of investigation of the composition of the many varieties of yellow, red and brown crystals from Castle Dome and Silver district, now usually referred to Wulfenite, though it is probahle that several species are represented.

The Castle Dome vanadinite is totally different in appearance from the red crystale of Silver district. At Castle Dome the vanadinm appeare to be present in varying proportions in the cryetale of different appearance, though all hexagonal, and to he associated with arsenic acid in the mineral species mimetite.

Mimetite.

Some of the specimens giving strong arsenical odors on coal and having the external characters of mimetite or arsenate of lead, give also characteristio reactions for vanadic acid, though not to the same degree, or so distinctly as other crystale where the arsenical reactions are weaker. The strongest reactions for arsenic, so far obtained, are from the crusts of small aggregated crystals of a light brown or straw-yellow color and wax-like luster. The deportment with nitric acid varies, but all the varieties diesolve and give finally yellow solutions, which become green and blue where deoxidized hy organic acide or alcohol. The occurrence of vanadic acid in mimetite is not unknown, Domeyko having fonnd it in mimetite from Mina Grande, Chile.

In all of the specimens so far examined, whether the light yellow, barrel-shaped crystals, or the long, taperiog, hexagonal prieme, or the dendritic aggregatee, reactions for chlorine are obtained, and the yellow nitric solutions hecome green by heating with alcohol.

It is intereetiug to note here that recent researches by M. Bertrand go to show that the hexagonal crystals of mimetite are compound crystals, mado np by twinning of orthorombic crystals. This has been shown by the study of the optical characters. While pyromorphite is truly hexagonal, ehowing only one axis of symmetrical polarization, mimetite was found to have two optic axes. It is poseible that we may find crystals large enough from Castle Dome or Silver district to examine with the polariscope, and ascertain whether they are in reality compounded or siugle.

Vanadinite at Silver District.

Vanadinite also occnrs in beautiful crimson-red crystals in the Hamburg mine at Silver district. Theee cryetals are small, but are beautifnlly distinct hexagonal prisms or "berylloide," being similarly shaped, and are terminated by a flat plane at rigbt angles with the planes of tbe prism. The terminal edges are replaced hy a minnte brilliant plane, and in one or two of the crystals a plane replacing one of the solid angles has been observed. The material at hand is insufficient to give me the best specimens for examination by the goniomoter, so as to accnrately measure the inclination of theee terminal planes to the base or sides. I have, however, mounted one of the minute crystals in hand, and find the angles of the prism apparently equal, so there is little dooht of its truly hexagonal form. The seemingly partial termination or modification of the terminal edges in some crystals raised the question whether, though apparently hexagonal, the trne form might not be rhombic.

The streak or powder of this mineral is salmon-colored or orange red.

It dissolves completely in dilnto nitric acid, bnt in strong nitric acid if added in small quantities, there is a separation of a red powder, which floats of in the acid and is then diesolved, giving a yellow solution, which, after standing some hours, becomes green. It is also tnrned green in a few momente by the addition of a small quantity of alcohol, and this green solution, on boiling, turns blue. These reactions are characteristic of vaoadic acid.

With microcosmic salt in the outer blowpipe flame, we obtain a yellowish green glass, which in the reducing flame is changed to ao emerald green when cold.

Witb borax in the outer flame an olive brown bead results. Strong reactions for chlorine are obtsined by the silver test.

Some of the crystals are light amber colored and are traneparent and some of them aro much darker in color near the terminal plane than at the foot of the prism where it adheres to the gangue.

Vanadic Molybdates.

In the Red Cloud mine at Silver district and likewise at the Silver Glance mine numerous fine specimens of tabular crystals of Wulfenite have been procured from time to time for the past two years. These crystals are often half an inch across, and are from one-sixteenth to one-eighth of an inch thick. The chief peculiarity is their fine red color, very different from that of ordinary molybdate of lead and contrasting strongly with the yellow Wulfenite crystals from the same localities, and from thoee also of Castle Dome. These red crystals I provisionally refer to the ranadiferous variety of Wulfenite. A oomplete analysis is, however, needed to show the compoeition of this and other allied varieties found in other claims at Silver district, notably at the mines opened hy Bamber & Sons—"The Oakland Boys' claim."

The firet red cryetals of Wulfenite observed in the United States were extremely small, being almost microscopic, and were implanted on the ores from the Wheatley mine, at Phœnixville, Pa. They were found by the writer, and the red color wss at firet supposed to be due to chromic acid, but when the mineral was procured in quantity sufficient for analysis, Prof. J. Lawrence Smith showed that the red color wae due to the presence of vanadic acid. The Silver district epecimens now afford sufficient material to permit of a quantitative determination of the constituents.

Octahedral Cryetals.

Beantiful octahedral crystale, of a reddish-brown color, are obtained at the Oakland Boye' claim. I regard these as another vanadic mineral, poseibly a vanadic vsriety of Wulfenite, though the form and the color are so different from the form and color of nndoubted Wulfenite in the same district. I am inclined to regard it as a distinct species, or, at least, a well characterized variety. I regret that tho epecimens I expected have not arrived, thue preventing my making tests and giviog a epecific description.

I am indebted to Mr. Wm. P. Miller, the general euperintendent of the Castle Dome mines and the emelting works at Melrose, for assistance in procuring eome of the specimcne which I have been describing. Some were obtained by me at the minee, April, 1880, and others at the time of my last visit to the mines this past spring. WM. P. BLAKE.

Mill Rock, New Haven, July 29, 1881.

FRESNO MINES.—A subscriber sends ue the following: The mining interest in this district appears to be looking up. The Fresno Enterprise is busily engaged in putting their new mill in order. The Gambetta, on Gruh gulch, ie extracting and sacking a large amount of very rich ore. It is a very rich mine. The Surprise has changed hands. The McDonald Bros. have hought the original locatore out and are pushing the developments with energy. They are down 125 ft., and have a splendid ledge 9 ft. wide. The walls are slate, and are as perfect as they can be, and the ore (which is sulphurets) ie of a very high grade. Tho assays run from $1,100 to $3,100 to a ton of eulphurete. Tho eulphurets average 3%. This mine promises to be one of tho best in the State.

SAYS the *Territorial Enterprise:* Parties proepecting in the lake and deeerted regione for salt, soda, horax, nitrate of eoda, etc., would find a horing machine of great use. It is well known that euch deposits are almost invariably covered with several feet of sand and alkaline soil. To dig through such depoeits in many places is a tedious business, hut with a suitahle horing machine scores of holes might be cheaply sunk.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacifo Coast Inventors.

From Official Reports for tho "Mining and Scientific Press," U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING AUGUST 2D, 1881.

244,977.—ORE CRUSHER AND PULVERIZER—G. F. E. Brinckmann, S. F.
245,129.—VEHICLE SPRING—G. G. Buckland, Tulare Cal.
245,131.—THILL COUPLING—A. Cadwell, Petaluma Cal.
244,991.—HAND RAKE—J. Fox, Alameda, Cal.
245,153.—FOLDING SEAT—Geo. H Fuller, S. F.
245,195.—REFRIGERATOR FOR BEER BARRELS—Messenburg & Wesch r, S. F.
245,229.—FEED WATER HEATER—I. M. SCOTT, S. F.
245,030.—ORE STAMP MILL—Jas M. Thompson, S. F.
245,031.—MACHINE FOR MAKING BLASTING CHARGES—Geo. Trench, S. F.
245,033.—HARROW—VAN GELDER & BATCHELOR—Sacramento, Cal.
245,032.—GRAPPLING OR BALE HOOK—J. M. Vance, Eureka, Cal.
245,038.—MINE DRAINING APPARATUS—Wilcox & Farquharson, S. F.
245,039.—CLOTHES PIN—Jos. Williams, Menlo Park, Cal,
245,251.—REVOLVING DIP NET—T. F. Williams, Lower Cascades, Oregon.
245,041.—CAN FOR EFFERVESCING LIQUIDS—Sam'l. Wood, S. F.
245,255.—STOCK CAR—L. Woodruff, Ellensburg, Gregon.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest poesible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

ORE CRUSHER AND PULVERIZER.—G. F. E. Briockmann, Oakland. Dated August 2, 1881. No. 244,977. This patent covers improvemeots on a previous invention hy Mr. Brinckmaon. These improvemeots coosist in providing a cyliodrical muller, and the oecessary coostruction of the mortar or die in which it is contaioed, to allow of its perfect operatioo. Further, in providing adjustahle roller hearings or pressure wheels, tightened hy set screws and pressing upon the top of the muller for the purpose of preventiog it from rising, whereby he dispenses with the use of the muller or supplementary rollers used io the former pateot, and also does away with the flanges aod plate oecessary to hold the rollers in place. It further consists of a peculiar constructioo of the mortar or die, whereby they may he essily aod readily fitted with shoes; and finally, io a peculiar device for feediog the ore on hoth sides of the machine aud evenly over the exteot of the rollers.

MACHINE FOR MAKING BLASTING CARTRIDGES.—George Frcoch, S. F. This inveotion relates to an improvement in the maoufacture of hlasting charges, and refers more particularly to the mechaoical method of making the charge of the desired form and compactness, and to the machinery for accomplishing this result. In the manufacturing blasting charges which consist of crushed or pulped gun cotton, mixed with any of the nitrates, it is oecessary to suhmit each charge to a heavy pressure aod form it into cylinders of high density, aod some of said cylinders must he perforated to receive the safety fuse aod detonator, hy which the charge is exploded. This treatment is necessary in order to produce the best results in miniog, and the invention is intended to provide a machine hy which the charges are properly compacted and perforated. This iovention has been assigned to the Tonite Powder Compaoy.

CAN FOR EFFERVESCING LIQUIDS.—Samuel Wood, S. F. Dated August 2, 1881. No. 245,041. This iovention relates to a can for holdiog liquids in au effervescent state, whereby their condition is preserved for a considershle time. The object of the iovention is to provide a receptacle smaller and more coovenient than that in which the liquid first comes, ioto which a desired quantity can he drawo, and where it will retain its effervescent quality as fully as if retained in the origioal keg, harrel, or other receptacle. In other words. Mr. Wood wishes to obtain the advantages of an ordinary can or pail, as far as convenience is concerned, and at the same time retain the nse and henefit of the larger vessel as to its capacity to keep the liquid in effervescent condition.

FEED WATER HEATERS. Irving M. Scott, S. F. Dated August 2, 1881. No. 245,229. This iovention relates to that class of heaters which are used to furnish water to steam hoilers, aod are koowu as "feed water heaters." It coosists in a novel srraogemeot of pipes and chambers, through which the water is forced, heing at the time exposed to the heat of the waste steam which surrounds the said pipes. The device has been thoroughly tested and works very satisfactorily.

THILL COUPLING. Alexander Cadwell, Petaluma. Dated August 2, 1881. No. 245,131. This invention consists in certain details of construction in thill couplings. The object is to secure the holt tightly, whereby all rattling is prevented and the danger of loss and accideot averted.

An Inventor.

The Trouble He Causes His Wife by His Various Devices.

"It is all very well to talk about working for the heathen," said one, as the ladies of the circle put aside their sewing, "but I'd like to have some one tell me what I'm to do with my husband."

"What's the matter with him?" asked a sympathetic old lady.

"William is a good man," continued the first, waving her glasses in an argumentative way, "but William will invent. He goes inventing around from morning till night, and I have no peace or comfort. I didn't object when he invented a fire-escape, but I did remonstrate when he wanted me to crawl out of the window one night last winter to see if it worked well. Then he originated a lock for the door, that wouldn't open from midnight until morning, so as to keep burglars out. The first time he tried it he caught his coat-tail in it, and I had to walk around him with a pan of hot coals all night to keep him from freezing."

"Why didn't he take his coat off?"

"I wanted him to, but he stood around til the thing opened itself trying to invent some way of unfastening it. That's William's trouble. He will invent. A little while ago he got up a cabinet bedstead that would shut and open without handling. It went by clockwork. William got into it and up it went. Bless your heart, he stayed in there from Saturday afternoon till Sunday evening, when it flew open and disclosed William with the plans and specifications of a patent wash-bowl that would tip over when it got just so full. The result of that was I lost all my rings and a breastpin down the waste-pipe. Then he got up a crutch for a man that could also be used as an opera-glass. Whenever the man leaned on it up it shut, and when he put it to his eyes to find William, it flew out into a crutch and almost broke the top of his head off."

"Don't any of his inventions amount to anything?"

"He says they do. Once he invented a rope-ladder to be worn as a guard-chain and lengthened out with a spring. He put it around his neck, but the spring got loose and turned it into a ladder, and almost choked him to death. Then he invented a patent footbeel to crack nuts with, and gave it up. His coal-scuttle has made more trouble than anything else. It was rivetted to the grate, and, when the fire got low, it would turn over and pour on coal. The rivets got rusty so he couldn't get it off, and I just sit up in bed and listen to that scuttle all night. Then he arranged a corn-popper so it would wiggle itself, and now he can't stop it. You can hear that popper going around in the closet, and he won't let me throw it away, because he wants to invent something to hold it still. Why, he has got a washtub full of inventions. One of them is a prayer-hook that always opens at the right place. We tried it on one morning at church, but the wheels and springs made such a row that the sexton took William out by the collar and told him to leave his fire-engines at home when he came to worship. The other day I saw him going up the street with the model of a grain elevator sticking out of his hip-pocket, and he is fixing up an improved shot-tower in our bed-room."

"Does he make any money out of his inventions?"

"He doesn't appear to. The other night a man came down and wanted William to get up a patent umbrella fastening. Since then he has wrecked all the umbrellas and parasols in the house. We haven't a thing to use if it should rain. Now he is at work on a combined cat-and-rat-trap. The cats and rats go in at different ends and eat each other up—at least, he says they will; and after that he is going at a pair of pantaloons, in which a man can fall down without spraining his leg. William means well, but he has got the mania for inventing, and I don't know where it will end." And the old woman sighed as she started for home to see what new inconvenience her ingenious husband was preparing to perpetrate.

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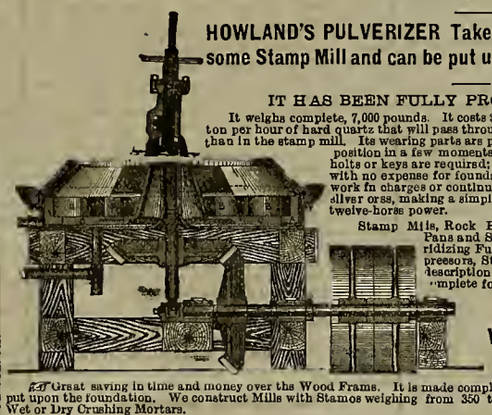

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Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill supplies Iron Work complete for Wood Frames, also
SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.
Great saving in time and money over the Wood Frames. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
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LEFFEL'S IMPROVED WATER WHEEL.

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PATENTS REISSUED 1868.
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THE MOST PERFECT TURBINE NOW IN USE.
Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
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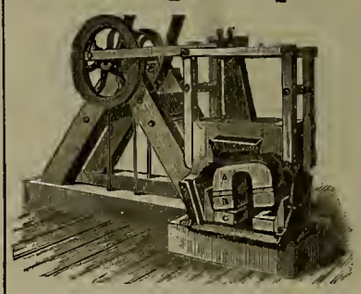

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Oration at Opening of Mechanics' Fair.

We gave last week a report of the opening exercises of the Mechanics Institute fair, but held over for want of space the able speech of W. W. Morrow. This we give herewith with the exception of the remarks on cable roads in San Francisco, which we keep for a future occasion:

Mr. President, Ladies and Gentlemen: A distinguished English visitor, after six weeks of travel in the United States, recently arrived in San Francisco.

He was of course duly welcomed, and asked the usual question as to his opinion of the country and its institutions. His reply was a candid confession that he did not feel competent to pass judgment on the affairs of a country, based upon observations made from the window of a railroad car.

The embarrassment of our English friend can be fully appreciated by any one who will attempt to gather and arrange statistics concerning our present progress in the mechanical arts and mechanical and agricultural productions. We are speeding along so rapidly through depressions and over altitudes that broad fields of facts, on either side of us, drift away before we can note their character or determine even their location.

The careful and conscientious student desiring to determine accurately the value of these vast industrial fields, must stop and proceed patiently and systematically to investigate details, before he can render a judgment that shall comprehend all the elements that go to make up the material wealth and prosperity af a country.

Happily no profound discussion of any question in which you, as friends of the Institute, are interested, is called for on this occasion. I shall therefore content myself with a few obvious comparisons and illustrations to prove what everybody already knows, that we are in the midst of progress, and the future is full of promise.

The Mechanics' Institute.

I learn from the reports of the officers of the Mechanics' Institute that it was founded on the 6th day of March, 1855, and that the first exhibition held under its auspices was inaugurated on the 7th day of September, 1857.

In the announcement made by the Managers of the Institute some time previous to the first exhibition, the influence of the proposed enterprise was expressed in strong and hopeful language. It was said: "The advantages of fairs must appear obvious to every reflecting mind; and in no quarter of this globe do they promise more than in California, where so much may be accomplished by the dissemination of correct information relative to her natural and artificial resources. Besides exciting emulation, extending practical knowledge, suggesting ideas to ingenious minds, affording tangible evidence of superiority, stimulating talent, exhibiting the progress of the arts, promoting extensive intercourse among producers and their patrons, they cannot fail to excite a world-wide interest in regard to our State, and extend reliable information respecting its resources, which will tend to encourage immigration and permanently establish beneath our genial skies an industrious, enlightened, prosperous and happy population."

It is pleasant now to note the sanguine expectations of the originators of these splendid exhibitions, and know that they have been more than realized. And the occasion of the opening of this, the Sixteenth Industrial Exhibition, seems a fitting opportunity to consider the progress that has been made in California, and particularly in San Francisco, in the last 24 years in those departments of industry with which this Institute is intimately connected.

Progress of the State.

In 1857, the excitement caused by the discovery of rich placer mines nine years before in the lower ranges of the Sierras, had about run its course with the exhaustion of the surface deposits.

The more restless of the adventurous miners had either departed for their Eastern homes or were searching for new El Dorados.

The Comstock was yet unknown.

It was a period when the future of the State seemed uncertain, but there was a large number of energetic and enterprising young men who determined not to abandon, without further trial, a country which, in their eyes, gave promise of a great future.

A few farmers scattered here and there over the State had demonstrated that its broad sunny valleys were capable of producing large crops of grain of all kinds, while fruits and vegetables of every description grew in abundance.

During the year ending July 1, 1857, a larger crop of wheat, barley and oats had been grown than was necessary for home consumption, and a surplus of less than 40,000 bushels of wheat, 140,000 bushels of barley, and about 26,000 bushels of oats was exported. The wheat found a ready and profitable market abroad. The fact was suggestive, and gave encouragement that while the glory of our mineral wealth might suffer as the product decreased, there was wealth in the soil that would give the State a more enduring and a far brighter fame.

An agricultural community meant an abiding and industrious population requiring manufactures to supply its various and constantly increasing wants. This was the theme of the first Industrial Exhibition held in San Francisco.

What has the harvest been? The wheat and flour exports from California since then have reached the enormous figures of one hundred and thirty millions of rentals, or the equivalent of more than two hundred and sixteen millions of bushels. The export of wheat last year alone amounted to more than fifteen million centals, or twenty-five millions of bushels, while the total production probably exceeded thirty millions of centals, or fifty millions of bushels.

The barley crop has been estimated to exceed 5,000,000 of centals; the wool crop at 46,000,000 of pounds, and the wine product at 12,000,000 gallons.

It would weary you to go through the whole list of productions, but enough has been stated to show how generously the soil and climate have responded to the predictions made 24 years ago.

Now, what has the patient, hard-working mechanic been doing all these years? There are no statistics at hand showing the extent of the manufactures in San Francisco in 1857, for this kind of industry was then in its infancy. The Assessor of this city and county reports that the total value of manufactures in San Francisco during the year 1880 was $72,364,680, and that the number of men, women and boys employed was 28,232. This is an increase over the year previous of $2,869,800 in the value of articles manufactured, and 2,671 in the number of men, women and boys employed.

Is it a ny wonder that the pavilion used for the first exhibition, covering less than a half an acre and giving floor space of only 20,000 square feet, has given place to the present magnificent structure covering more than four acres of ground, and furnishing floor space of 175,000 square feet? We are not surprised either when we are told that the present building must give away to still another, and that before the time comes around for the next exhibition, a permanent building is to be erected of such grand proportions and architecture as to be at once the pride of the city and the glory of the State.

All honor to the public-spirited gentlemen who founded the Mechanics' Institute. All honor to their successors, who have supported and carried it forward to the important position it now occupies, as a substantial power in developing the mechanical industries of the city and State.

"Mind acting through the useful arts," says Mr. Everett, "is the vital principal of modern civilized society."

"The mechanician, not the magician, is now the master of life. He kindles the fires of his steam engine, and the rivers, the lakes, the ocean are covered with flying vessels; mighty chain-pumps descend, clanking and groaning, to the deepest abysses of the coal mines, and rid them of their deluge of waters; and spindles and looms ply their task as if instinct with life. It is the necromancy of the creative machinist." This was said forty-four years ago, and it makes one curious to know what graceful thought would have been suggested to the eloquent orator by the wonderful machinery that now lifts the water from the profound depths of the Comstock lode. How much more, too, would he have been impressed with the great and all-pervading power of mechanic arts as they have since been developed in all departments of industry!

If we examine the discoveries of the past centuries and compare them with the inventions of our own times, we feel a pride in pointing out where the genius of man has triumphed here and there in solving some great mechanical difficulty, and we are often surprised, when the problem is solved, to find it had not been done before.

The expansive power of steam was known long before Watt put it into the form that has developed into the modern steam engine.

The electric current was known and recognized by the ancients, but who among them ever dreamed of applying it to the uses of to-day—the telegraph, the telephone, the phonograph, or the commercial light?

The principles involved in the power and pressure of water have been more or less understood and utilized for centuries, but it was the modern inventor that adapted those principles to the hydraulic lift, the hydrostatic engine, and the hydraulic nozzle.

And so with innumerable things in innumerable ways, genius, necessity and opportunity separately and jointly have supplied, improved and invented.

Inventive Genius in California.

In points of mechanical invention and adaptation California has no need to feel ashamed of her record, and when we consider that the predominating influences here have not been favorable to deep thought and careful study, except as exigencies have arisen which momentarily commanded concentration of mind, the many evidences of genius among our mechanics and thinking men invoke admiration and satisfaction.

In some of the modern inventions California, perhaps, furnishes some of the best examples that can be found of improvements in the use and economy of forces. This is entirely natural and reasonable, when we remember that our population was not the result of growth upon the soil. We were all Topsys—"Never was born; never had no father, nor mother, nor nothin'. I was raised by a speculator, with lots of others." Our raising seems to have shaped our character. Nature appeared to us strangely accoutered, and to subdue it quickly and effectively, we have sought for the best weapons we could find.

A friendly critic said of us a few years ago that we appeared like a bran-new people with a bran-new country. He saw no evidences of a former generation. No old people, no ancient places, no antique things, no relics. It was as though in the school of events it had been determined to try the experiment of placing a perfectly clean slate (not a political one) in the hands of a new generation of men, and requiring them, without rule, direction or copy, to work out the sum of all their capacities. With such a people there was no prejudice against new appliances.

The farmer commenced work without old tools and of course he was anxious to get the best of the new. The miner was obliged to invent new machinery to enable him to search for the hidden treasure or he must abandon the pursuit. The prize was a glittering one, and he began to think. When a full-grown man, accustomed to toil and struggle, is urged by a powerful incentive to think, he generally goes direct to the point. He may grasp his subject awkwardly, and even fail to comprehend it; but the chances are that he will break through some mystery by force and reach a truth, the road to which will afterward be explained by the scholar on strictly scientific principles.

The Miners.

The California miners have done wonders in increasing the power of man's agencies in the search for the precious metals.

In 1852 it occurred to a Placer county miner that the pressure of water might be used in working a gravel claim. He accordingly placed a barrel in some convenient place high above the ground he desired to work. Into the barrel he led a small stream of water and made a reservoir. From the barrel to his claim he stretched a hose made of common rawhide, and ending in a four-foot tin tube, the nozzle of which was one inch in diameter. This cheap and simple contrivance proved to be equal to the labor of several men in removing the earth and washing out the gold, and was the origin of what is now known all over the world as hydraulic mining.

The need of a large quantity of water under heavy pressure for this kind of mining has required its conveyance for long distances around mountains and across deep gorges. Here the inventive genius of the miner has enabled him to overcome difficulties which at first seemed insurmountable. The old heavy metal pipe could not well be secured and supported at a great hight; but by successive improvements a thin sheet-iron pipe takes its place, and may now he seen suspended across gorges nearly 2,000 ft. in depth.

At the mine where the water is used it is now discharged from an ingeniously contrived nozzle, under a pressure that makes the stream as rigid as a bar of steel. It plays with huge bowlders as a child would play with marbles, and yet it is as easily controlled as the water faucet in your chamber basin.

What a marvel of power and convenience has been developed since that first experiment in 1852. But here I am assailed by a distressing douht. Has all this power and mechanism been entirely beneficial? I fear that it has not. The miner has been expeditious and successful in scouring the hills for gold, but what has become of the mountains of earth he has washed down? This is dangerous ground. It has been said that rivers have been filled up and large tracts of agricultural land destroyed hy it. It is said also that under the aggressive name of *debris* it has found its way into the halls of legislation and produced fearful havoc in the political and financial affairs of the State.

If all this is true we must find either an engineer or politician—if he has not been found already—who will have the genius to follow up the inventions and improvements in this branch of industry with some new and effective device that will make the hydraulic miner an unqualified blessing, or abolish him altogether.

The quartz miner has also done much in improving the methods and machincry long used for extracting and crushing ores.

For three or four hundred years the ponderous looking stamps used in the quartz mills of mining countries and brought here when quartz mining first commensed, were bobbing up and down in a most ridiculously ineffective manner. The stamp used was square and had a square wooden sbaft, and the whole was lifted by a cam (usually also of wood), working in a long cut in the square stamp-head. Some bright fellow in the mountains, having no reverence for this aged contrivance, gave it new youth and vigor by substituting iron for wood, and a cylindrical shaft and stamp-head for the square apparatus.

He thus simplified the construction of the several parts of the stamp, and by then giving it a rotary motion made the shoes which crush the rock wear uniformly, and that is your quartz mill of to-day.

This was an exceedingly simple but valuable improvement, and the great wonder is that it was not made before.

As early as 1854 the hydraulic jack was employed hy an ingenious mechanic in this city for raising massive buildings. Since then the same method has been used in Chicago and other large cities for a like purpose.

A small stream of water conducted through small pipes to numerous hydraulic jacks has quickly, steadily and silently done the work which would otherwise have required the employment of a large force of men in a slow and dangerous operation.

The feature of the day, and that which strikes an observer most forcibly, is the application of well-known scientific principles in simple, easy ways for the performance of work about the foundry, the machine shop, the mill or the factory. Turn where you will and you will find some simple device which solves a problem, the solution of which has cost hours of thought and patient application. So simple and obvious are many of these modern scientific improvements to machinery that one can hut wonder at the delay in applying in practice a knowledge of principles which have been understood so long. Only the other day I saw in an engine room of one of the large mills in this city a contrivance which was represented to be simple, and it so appeared.

It was certainly very useful, and the explanation I had of it was so interesting I determined to make a note of its operation.

Within a huge steam cylinder, under a pressure of from 80 to 100 pounds to the square inch, a piston traverses from end to end, according to the speed of the engine, perhaps fifty, sixty or seventy times every minute. Each square inch of the circumference of the piston bears closely enough upon the interior surface of the cylinder during its rapid movements, to prevent the passage of the subtle steam even under the tremendous pressure which is required to furnish the power for all the motion in this large establishment.

To maintain this great speed with economy of power and safety, the constant and regular introduction of some lubricant is necessary, but the place in which it is required seems inaccessible.

The problem of how to do this in the most satisfactory manner was solved by a San Francisco mechanic, and the whole principle involved was the simple one of specific gravity.

The whole world has always known that oil was lighter than water; hut it was only recently that this knowledge was made use of to introduce oil into a cylinder against a pressure of 100 pounds to the square inch.

Do you ask how it was done?

The inventive mechanic tapped the feed-pipe of the cylinder and led a small pipe from this point by a circuit of a few feet to a point in the same feed-pipe nearer the cylinder. Midway in this second pipe he interposed an oil cup. The oil, subject to a pressure each way equal to the cylinder pressure, be it what it may, is in a state of equilibrium. But the effect of conducting the steam to the cup in the small pipe is to give it an extra exposure to the air and produce a slight condensation of steam into water. Each drop of water as it trickles from the pipe and settles into the oil cup, displaces a drop of oil, which immediately rises and is carried through the circuit and into the cylinder with the steam, where it performs its intended office. So simple, so perfect, so successful and economical was this device that it did not seem capable of improvement. And yet some bright, ingenious mechanic saw that the thing was not complete; that in the hands of a shiftless man even this device might be used wastefully. To him occurred the idea that a glass tube filled with water might be interposed, forming a part of the return pipe, from the cup to the cylinder, and thus, each drop of oil as it proceeds on its errand might be compelled to reveal itself to the engineer.

Need I say that it was exceedingly interesting to stand by that cylinder, feel its mighty throb, realize the enormous power it exerted, and observe through the simple glass tube just described, the drops of oil hastening on with accuracy and dispatch to perform their appointed duty?

Our Material Resources.

If it now appears that we have an abundance of mechanical genius in this State, the next question of interest is, have we the material in the soil on which to found a large and comprehensive industry? Has nature provided large sources of water-power and stored up heat in forests of timber and fields of coal? The question is answered in a word.

The water-power of the western slope of the Sierra has been estimated to exceed that of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey and Delaware.

This tremendous force is now employed in only a limited way hy the hydraulic miner, while in the winter season it spends itself extravagantly in flooding the valleys below.

The time will soon come when the hundreds of miles of ditches, canals and flumes that now line the mountain sides for mining purposes will be utilized, and their capacity increased to supply power for manufactories.

The immense forests of timber found in the Coast Range and Sierras should be a source of untold and lasting wealth to the State in supplying lumber for building purposes, material for all kinds of woodwork and fuel for mills and factories, but, unfortunately, the lumberman, although enterprising and liberal, is plying an exceedingly wasteful trade. He plants his greedy sawmill in the forest beside the river, and immediately enters into a conspiracy with steel and water to carry on a work of destruction. The splendid groves that nature required a thousand years to rear in their sublime grandeur are prostrated in a few days. The choice portions of these great trees are soon converted into lumber, but the remainder is too often burned or allowed to rot upon the ground.

There should be more economy exercised in supplying our present wants from these ancient woods, for the time may come when every stick of wood a foot long will have a commercial value.

The present very able and energetic President of this society can tell you more about the coal fields of this State and coast than I can, and I have no doubt hut that I would express his knowledge on the subject in a business-like way by saying that they are well nigh inexhaustible.

It is proper to say, however, that it was at one time supposed that the lack of large deposits of good coal was one of the few things wanting to found in this State a great mechanical industry.

The discovery of tertiary coal fields—a more recent formation than the anthracite or bituminous coal—and sometimes improperly called lignite, was considered as an indication that the older and better series would not be found on this coast. I remember the charming excuse that was made some years ago that Nature had been so busy making gold and silver she had not had the time to complete her manufacture of coal and we had surprised her in the act. This is proven to be only partially true, for the quality of our coal improves with each new discovery, until now, for smith purposes as well as for fuel, our home product promises soon to supply all our home demands.

Prospectors also report discoveries of coal of a quality that will yield excellent coke and hard coal suitable for the forge. The consumer is thus assured that all his wants in this respect will soon be fully supplied in both quantity and quality by home production.

At this point the pleasant duty devolves upon me to make the announcement of an event of more importance to the people of this coast than the result of an election or the birth of a prince. And yet it is indeed the birth of a king that I am called upon to proclaim to you. A king wielding an influence more potent than gold, and hearing in his hands the scepter of an absolute power.

In order that the advent of this new dynasty may be properly recorded in the annals of the State, let us notice with some particularity that at 4 o'clock on Sunday morning, April 24, 1881, the first iron ever made in California was run from the furnace. The event took place in Placer county, and the locality is named Hotaling, in honor of the well known San Francisco merchant, who, with Irving M. Scott (a former President of this Institute), and Egbert Judson were the founders of this enterprise.

The establishment is under the superintendence of James M. White. It produces 25 tons of iron per day, and as it has now been in operation just 100 days its production has been 2,500 tons. As the supply of ore, fuel, and other materials required is practically inexhaustible, the manufacture of pig iron may now he considered a permanent business in this State. The King has been installed. Long live the King! But you may ask why is this an exceptionally important event in California? The question is easily answered. It is because iron enters so largely and generally into the Mechanic Arts that they can scarcely be said to exist without it. And the lessons of all the years since 1849 have been that we must make use of the original materials that have been so generously supplied by nature, work them into what is called raw materials, and in the manipulation of the latter become manufacturers, or we will lose through competition all the advantages we gain in other departments.

Foreign burlaps and machinery deprive our farmers of a considerable profit on their grain crop, and so it is in many other branches of business.

Any community that obtains its raw materials from abroad is at best hut a vassal of some other section, while every addition made to its products is a link severed from the chain of dependence that binds it, however unwillingly, to a distant and perhaps an unfriendly interest.

The manufacture at home of a good quality of pig iron liherates us at once from the domination of the foreign metal markets, and makes possible the manufacture of many things of vast importance to the people of this coast. Iron plates suitable for shipbuilding ought to be made here. This would enable the Pacific coast to build and own a fleet of ships that could control the coast and foreign trade in the interest of home capital and enterprise.

Then would arise a demand for skilled as well as unskilled labor, and by cheapening construction extend the area to be supplied, build up commercial trade, protect our merchants, and add another solid block to the foundation upon which our future greatness will rest.

The Mechanic.

The next, and by far the most important factor to be considered in any estimate of our future success in the manufacturing enterprises, is the mechanic himself, for without him all these calculations are idle and useless.

The question is, does this State furnish an inviting field in which the mechanic can work out the problem of a comfortable existence?

This has been a serious question in the presence of a constantly increasing foreign horde, rapidly monopolizing all departments of labor; but the recent ratification, by both parties, of a treaty between the United States and China, under which the United States is permitted to restrict this non-assimilating immigration, gives us hope to believe that this vexed question will soon be settled in favor of the Caucasian race.

Let Congress act promptly and effectively under the treaty stipulation, and put a stop to this invasion. The immense number of arrivals by every steamer warn us that action cannot be had too soon, and we look to our Representatives in both Houses of Congress for a determined effort in that behalf. With this question settled, the mechanics, and, in fact, all classes, will feel more contented. Agitation will necessarily cease when the cause for it is removed, and capital will return to its accustomed channels. Our young and active boys will be encouraged to learn some useful trade when they know they will not be driven from their employment by a race with whom they cannot compete on any narrow ground in a contest for existence.

There does not seem to be any just reason why this State should not be the best place in the world for the mechanic, and I believe it will be so demonstrated very soon; but there must be an effort made to attain excellence in workmanship before there can be any successful competition with the manufacturers of the East and Europe.

And here it is that the influence of this Institute should he made aggressive and effective. The society is to be congratulated for the splendid work it has already accomplished. Its library of over 30,000 volumes of choice literature, including the best collection of scientific works on the coast, is a matter of just pride. The courses of lectures it has furnished to its friends and patrons have been exceedingly beneficial, and the whole State has eagerly watched the improvements, encouraged and developed by the periodical exhibitions given under its auspices. But something more should be done in the direction of education. Our young men and boys need counsel and instruction, and I am glad to know that I but reiterate the opinion of the present officers of this society and their predecessors when I say that there should be some further means employed for imparting instruction in the mechanical or technical arts.

We have arrived at a point in the development of the resources of this State where the best appliances must be used and the most skillful workmen employed, if we expect to keep pace with the world at large.

The fruits that grew near at hand have all been gathered, and we must now reach and climb for that which is beyond our immediate grasp.

The first miners found gold near the surface, and generally separated it from the earth without the assistance of much machinery, or if any was used it was of the most simple character. But now we find the miner, as he pursues the receding metal into the mountain, assisted by the most complicated and powerful machinery on the globe, while he himself has developed a genius in the pursuit and a skill in controlling and directing his mechanical agents. And so it is in nearly all departments of industry. What the State wants now is men specially trained and skilled in their respective callings. Here again we have the raw material in abundance.

Our boys require just this training to make them safe citizens and capable of becoming a power in the great forces of the world. It is the men who labor in some legitimate industrial pursuit that furnish the muscle and the muscular brain—if I may be permitted to use the expression—to blaze pathways into the mysterious depths of nature and nature's forces.

News in Brief.

DIPHTHERIA prevails at Sawyer's Bar, Siskiyou.

JOHN CLARK, once Surveyor-General of Utah and New Mexico, is dead.

THE ship *Trafalgar*, 123 days from Antwerp, loaded with railroad iron for the California Southern railroad, arrived at San Diego Saturday.

THE postoffice at Mammoth city has been abolished, and thus has the last vestige of that once thriving mining town passed away.

HEAVY fires are raging in the foreste near San Bernardino mountain, and extending over into Bear valley. A large amount of damage to timber is reported.

THE Carson *Appeal* says: "The trout fishers now find plenty of game in the deep pools of Carson. Since the water has begun to run low the fish have left the riffles and gone into the still pools."

THE Reno *Journal* says the asylum and the new railroad will be the means of dishursing over $100,000 at that place within the next three months.

BARON ADOLPHE DE ROTHSCHILD, brother of the partnere in the Parie house, has bequeathed to the Louvre his collection of art works, with $200,000 for their maintenance.

Our Agents.

OUR FRIENDS can do much in ald of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. F. OSBORNE—San Francisco.
G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—Napa, Nevada and Placer counties.
ORO H. HOPKINS—Amador county.
A. LEONARD MEYER—Utah and Idaho Ter.
C. E. WETMORE—Alameda county.
J. M. WOLFE—California.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

THE State Mining Bureau, No. 313 Pine street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

COPP'S "U. S. MINERAL LANDS, LAWS, FORMS, INSTRUCTIONS AND DECISIONS."—1881. 570 pp. In full law binding, $4.50; half law binding, $3, at this office.

Metals.

[WHOLESALE.
WEDNESDAY, August 10, 1881.

IRON.—	
American, Pig, soft, ton	— @30 00
Scotch, Pig, ton	— @25 00
American White Pig, ton	— @— —
Oregon Pig, ton	— @26 00
Clipper Gap, White	— @26 00
Clipper Gap Car Wheel	— @35 00
Refined Bar	4½@ 8
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	— @ 9½
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	16 @ 18
Black Diamond, ordinary sizes	13 @ 15
Drill	15 @ 18
Flat Bar	— @ 16
Plow Steel	15 @ 16
COPPER.—	
Ingots	— @ 52
Sheet	— @ 20
Sheating, Tinned 14x18	— @ 42
Nails	— @ —
Bolts	38 @ 42
Old	— @ 18
Bar	— @ 22
Cement, 100 fine	— @ 15½
LEAD.—	
Pig	— @ 4½
Bar	— @ 8
Pipe	— @ 8
Sheet	— @ 9
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES.—	
10x14 I C Charcoal	— @ 7 50
10x14 I O Coke	6 00 @ 6 25
Banca Tin	— @25 00
Australian	— @22 00
I. C. Charcoal Roofing 14x20	— @ 7 25
" " " 20x28	20 00 @21 00
ZINC.—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS.—	
Assorted Sizes	3 50 @ 3 75

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending August 9, 1881.

HIGHEST AND LOWEST BAROMETER.

Aug 3	Aug. 4	Aug. 5	Aug. 6	Aug. 7	Aug. 8	Aug. 9
29.890	29.942	29.981	29.938	30.021	29.975	29.903
29.776	29.854	29.888	29.853	29.886	29.860	29.828

MAXIMUM AND MINIMUM THERMOMETER.

61	66	67	67	67	64	65
52	53	54	54	54	55	54

MEAN DAILY HUMIDITY.

81	75.7	74.7	7.77	79.7	81.7	78

PREVAILING WIND.

SW	W	W	W	W	W	W

WIND—MILES TRAVELED.

352	303	306	325	379	219	345

STATE OF WEATHER.

Foggy.	Fair.	Clear.	Clear.	Clear.	Fair.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1881, —— inches.

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, August 3, 3 P. M.

SILVER, ¾.

GOLD BARS, 890@910. SILVER BARS, 10@18 ℘ cent. discount.

EXCHANGE on New York, par; London, 49½@49¾; Paris, 5.20 francs ℘ dollar; Mexican dollars, 90@91.

NEW YORK (4 per cent), 115¾.

Mining and Other Companies.

Persone interested in incorporated shares will do well to recommend the publication of the official noticee of their companies in this paper, as the cheapest appropriate medium for the same.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company,

SAN FRANCISCO, AUGUST 9, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend, number twenty (20), of twenty-five (25) Cents per share was declared, payable on Monday, August fifteenth (15), 1881, at the office of the Company, Room 10, No. 328 Montgomery street, San Francisco, California. Transfer books closed on August tenth (10), 1881, at 3 P. M.

JOSEPH NASH, Sec'y.

REGULAR DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

SAN FRANCISCO, AUGUST 10, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, a Dividend (No. 50), of Fifty (50) Cents per share was declared, payable on Monday, August fifteenth (15), 1881. Transfer books closed on Thursday, August eleventh (11), 1881, at 3 o'clock P. M.

WM. WILLIS, Sec'y.

Office—Room No. 20, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

SAN FRANCISCO, AUGUST 10, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, an Extra Dividend (No. 51), of Twenty-five (25) Cents per share was declared, payable on Monday, August fifteenth (15), 1881. Transfer books closed on Thursday, August eleventh (11), 1881, at 3 o'clock P. M.

WM. WILLIS, Sec'y.

Office—Room No. 20, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Co.,

SAN FRANCISCO, August 2, 1881.

At a meeting of the Board of Directors of the above-named company, held this day, Dividend No. 31, of Seventy-five Cents (75c.) per share, was declared payable on FRIDAY, August 12, 1881, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Secretary.

Office—Room No. 20, Nevada Block, No. 309 Montgomery St, San Francisco, Cal.

ASSESSMENT NOTICE.

Consolidated Pacific Mining Company.

ASSESSMENT, NO. 3.

Amount.....Forty Cents per Share
Levied.....July 9, 1881
Delinquent.....August 12, 1881
Day of Sale.....September 1, 1881

F. E. LUTY, Secretary.

Office—Room 5, No. 330 Pine St., San Francisco, Cal.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending this date, the Board of Directors of The German Savings and Loan Society has declared a dividend on Term Deposits at the rate of five and one-tenth (5 1-10) per cent per annum, and on ordinary Deposits at the rate of four and one-fourth (4¼) per cent. per annum, free from Federal Taxes, and payable on and after the 11th day July, 1881. By order.

GEO. LETTE, Secretary.

San Francisco, June 30, 1881.

Steep Hollow Gold Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Liberty Hill Mining District, Nevada County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 6) levied on the 21st day of June, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. shares.	Amt.
Jos. Clark	3	50	$75 00
E. A. Richardson, Trustee	25	100	150 00
E. A. Richardson, Trustee	26	100	150 00
E. A. Richardson, Trustee	27	50	75 00
E. E. Dewey, Trustee	50	500	750 00
J. W. Pew, Trustee	55	2250	3375 00

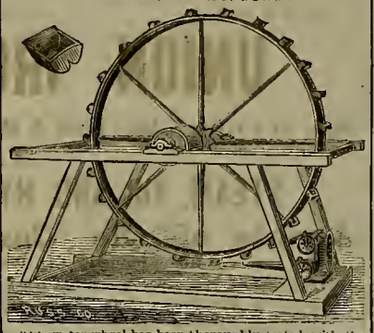
And in accordance with law, and an order of the Board of Directors, made on the 21st day of June, 1881, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the auction rooms of Jno. Middleton & Son, No. 116 Montgomery street, San Francisco, California, on Thursday, the 18th day of August, 1881, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

J. W. PEW, Secretary.

Office, 310 Pine street, room 15, San Francisco, Cal.

THE PELTON
WATER WHEEL.

(Patented, Oct. 26, 1880.)



The water wheel has been thoroughly tested with the Dynamometer, and utilizes 78% of the theoretical power; and underheads of water of 75 to 800 ft is guaranteed to give better satisfaction than any Turbine or other wheel ever offered to the public. The above per cent. is due to the peculiar shape of the buckets used. They do not reduce the water to a spray, but divide and deflect it outward and backward, in such a manner that a part of the impact and the whole reactionary force are utilized, without any part of the water coming in contact with the bucket following. Furthermore, the per cent. of efficiency remains constant through great variations in the amount of water used. These buckets can be taken off in transportation, and can be replaced by new ones when worn out by sand in the water; also can be applied to wooden wheels when desired.

☞SEND FOR CIRCULAR.☜

Orders can be filled at short notice by addressing the undersigned,

L. A. PELTON,
Camptonville, Yuba Co., Cal.

The Undersigned are Agents for, and are Prepared to Furnish Prices and all Particulars for

THE BALDWIN LOCOMOTIVES, every style and for any service.

THE BALDWIN STEAM MOTOR for use on City and Suburban Roads.

FREIGHT CARS,
PASSENGER CARS.
STREET CARS,
} From BILLEMEYER & SMALL CO., and J. M. JONES & CO.

CAR WHEELS. from A. Whitney & Sons.

RAILROAD IRON,
SPIKES, BOLTS, Etc.
} FROM BEST EASTERN MAKERS.

WILLIAMS, DIMOND & CO.
202 Market Street, San Francisco

Certificate of Partnership.

We certify that we constitute a partnership transacting business as manufacturers and dealers in patent water closets and other sanitary goods, in the State of California. Its principal place of business is San Francisco, California; its name is Milne & Gantz; the full names and respective places of residence of all its members are signed hereto.

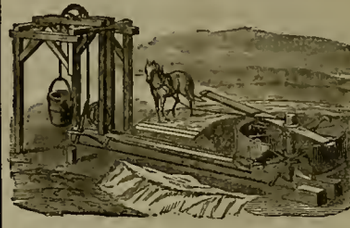
Dated, San Francisco, July 9th, 1881.

GEO. MILNE, residing at San Francisco Cal.
WM. H. GANTZ, residing at Oakland, Alameda County, California.

Duly acknowledged, July 9th, 1881, before W. H. Barton, Notary Public, in and for the City and County of San Francisco, and filed in the County Clerk's office of the City and County of San Francisco, July 9th, 1881. Endorsed: Filed July 9th, 1881. WILLIAM A. STUART, Clerk,
By JOHN H. MOTT, Deputy Clerk.

INGERSOLL
ECLIPSE ROCK DRILLS.

The Most Economical Air Compressors in the Market.



MINERS' HORSE-POWER.

One Horse can easily hoist over 1,000 pounds at a depth of 500 feet. The Power is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing

REYNOLDS & RIX,
49 Fremont St., S. F.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

SIEGLER SPRINGS HOTEL,

Lake County, California.

JOHN SPAULDING - - Proprietor.

GOOD HUNTING AND FISHING

Right at hand for the accommodation of invalids. Baths of any desired temperature.

The Scigler Springs stage will connect with the stage from Calistoga at Lower Lake on Monday, Wednesday and Friday; at Glenbrook on Tuesday, Thursday and Saturday. Time from San Francisco, 12 hours.

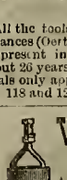
These Springs have no equal in the State for speedily and permanently curing Rheumatism, Gout, Stiff Joints, Dropsy, Scrofula, Skin Diseases, Gravel, Diabetes, Female Diseases, Dyspepsia, Catarrh, Chronic Dysentery, Chills and Fever, Lead Poisoning, Painters' Colic, Constipation of the Bowels, and all Diseases of the Stomach and Liver, Bright's Disease of the Kidneys, and Impurities of the Blood.

The Hotel will be kept open summer and winter, the water proving equally efficacious the year round.

Address all communications to "Siegler Springs," Lake County, Cal. W. T. CARRATT, Manager.

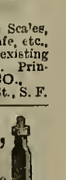
A Rare Chance For ASSAYERS OR MINING COMPANIES!

All the tools and Utensils, including Bullion Scales, Balances (Oertlings best), Furnaces, Crucibles, Safe, etc., at present in one of the oldest assay offices, (existing about 26 years in this city), for sale at a bargain. Principals only apply to JOHN TAYLOR & CO.,
118 and 120 Market and 15 and 17 California St., S. F.



WELL AUGERS, ROCK DRILLS

And the BEST MACHINERY in the WORLD for BORING and DRILLING WELLS by Horse or Steam Power.
BOOK FREE. Address
LOOMIS & NYMAN, TIFFIN, OHIO.



MINES WANTED.

Wanted for foreign account, two or three GOOD MINING PROPERTIES, in either Arizona, New Mexico or California. Also one California Dividend Paying Mine for New York account. Favorable report of expert essential.

E. L. OGDEN, Room 33, No. 18 Wall St., New York City.

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UNION IRON WORKS,
SACRAMENTO, CAL.
ROOT, NEILSON & CO.,
MANUFACTURERS OF
STEAM ENGINES, BOILERS AND ALL
Kinds of Machinery for Mining Purposes.
Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.
Front Street, Between N and O Streets,
SACRAMENTO, CAL.

Golden State & Miners Iron Works,
Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.
STEVENSON'S PATENT
Mold-Board AMALGAMATORS,
Golden State Pressure Blowers.
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California Brass Foundry,
No. 125 First Street, Opposite Minna.
SAN FRANCISCO, CAL.
All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. PRICES MODERATE.
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119 Beale Street, San Francisco.
General Mechanical Engineer and Machinist. Steam Engines, Flour, Quartz and Mining Machinery. Sole manufacturer of Brodie's Patent Rock Crushers and Steel-Faced Tappits. Agent and Manufacturer of F. A. Youse's Patent Steam Packing Rings for Steam Pistons. The best ever invented; can be applied to any Engine Piston and give entire satisfaction to those using. Steam, Hydraulic and Sidewalk Elevators. Repairing promptly attended to.

STEAM ENGINES AND BOILERS
Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by
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THOMPSON BROTHERS,
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129 and 131 Beale St., between Mission and Howard, S. F.
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42 years' practical experience; 14 on Pacific Coast.
ASSAYING TAUGHT.
No. 1 WALL ST. N.Y.
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EXAMINER OF MINES AND ASSAYER
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Practical, Civil, Mechanical and Mining Engineering,
SURVEYING, DRAWING AND ASSAYING,
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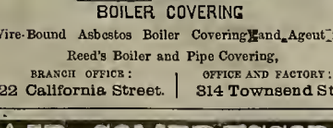
Send for Circular.

E. BUETTNER, C. E.
Mining Engineer.
MINING PROPERTIES EXAMINED AND REPORTED ON
FRISCO, BEAVER COUNTY, UTAH.

WIRE BOUND


BOILER COVERING
Wire-Bound Asbestos Boiler Covering and Agent for Reed's Boiler and Pipe Covering,
BRANCH OFFICE: 22 California Street. | OFFICE AND FACTORY: 314 Townsend St.

AIR COMPRESSORS
PRICES REDUCED. SEND FOR NEW CATALOGUE.
CLAYTON STEAM PUMP WORKS
14 AND 16 WATER STREET, BROOKLYN, N. Y.

COKE. PATENT. COKE.

This COKE is exclusively used by Prof. Thomas Price, in his assay office, by the Selby Smelting and Lead Co., Prescott, Scott & Co, Risdon Iron and Locomotive Works and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Copper Queen Mining Co., Longfellow Copper Mining Co. and other consumers in Arizona.

The undersigned are in receipt of regular supplies from Cardiff, Wales, and offer the COKE for sale in quantities to suit purchasers.

BALFOUR, GUTHRIE & CO.,
316 California St., San Francisco.

VULCAN BLASTING POWDER.

—THE MOST ECONOMICAL AND BEST—
Nitro-Glycerine Explosive in the Market.

In the suit of the Giant Powder Co. against the Vulcan Powder Co. for *alleged* infringement of Patent, it was held that the Giant Powder Patent was INVALID.

Nos. 1, 2 and 3 Vulcan,
Each grade superior to like numbers of any other Nitro-Glycerine Powder in the market.

VULCAN B. B.,
Superior to Black, Judson or any low grade Powder for Bank Blasts, Railroad work, or any work where Black Powder has been heretofore employed.
TRIPLE FORCE CAPS AND ALL GRADES OF FUSE.
The CONSUMER'S COMPANY sell the best Powder at the lowest rates.
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STEAM, AIR AND HYDRAULIC MACHINERY.
Agents of the Cameron Steam Pump.
Home Industry.—All Work Tested and Guaranteed.

VERTICAL ENGINES,	BABY HOISTS,	STAMPS,
HORIZONTAL ENGINES,	VENTILATING FANS,	PANS,
AUTOMATIC CUT-OFF ENGINES,	ROCK BREAKERS,	SETTLERS,
COMPOUND CONDENSING ENGINES,	SELF-FEEDERS,	RETORTS,
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TRY OUR MAKE, CHEAPEST AND BEST IN USE.
Send for Late Circulars. PRESCOTT, SCOTT & CO.

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RANKIN, BRAYTON & CO.
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Builders of Engines, Boilers, all Classes of Machinery.
PLANTS FOR GOLD AND SILVER MILLS,
Embracing the latest and most Improved Machinery and Processes for Base and Free Ores.
WATER JACKET SMELTING FURNACES,
For both Galena and Copper Ores of the Most Improved Construction.
Having Built nearly every successful working Furnace on the Coast, we are prepared to guarantee the best results attainable in all classes of Ores.
HOISTING AND PUMPING MACHINERY,
Embracing all Known Improvements.
WHEELOCK'S AUTOMATIC CUT-OFF ENGINE,
Beyond Question the most economical and perfect working Engine now made.
WALKER'S COMPOUND STEAM PUMPS,
The best in use. W work with thirty per cent. less steam than any other Pump in the market.
Sole Agents for HOWELL'S IMPROVED WHITE FURNACE.
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(SUCCESSOR TO HAWKINS & CANTRELL).
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IN ALL ITS BRANCHES,
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STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.
ORDINARY ENGINES compounded when advisable.
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STEAM BOILERS. Particular attention given the quality of the material and workmanship, and none but first-class work produced.
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SHIP WORK. Ship and Steam Capstans, Steam Winches, Air and Circulating Pumps, made after the most approved plans.
PUMPS. Direct Acting Pumps, for Irrigation or City Water Works purposes, built with the celebrated Davy Valve Motion, superior to any other Pump.

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Owners of the Brush System of Electric Lighting for the Pacific Coast.
Apparatus for sale for Mines, Mills, Manufactories, etc.
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Electric Light furnished on all the principal streets of the city.

Office—No. 119 O'Farrell Street,
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NEW ALMADEN MINE,
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THE QUICKSILVER MINING COMPANY,
J. B. RANDOL, Manager,
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Over Wells, Fargo & Co.'s Express Office.

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J. W. QUICK, MANUFACTURER,

Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT CUT and SLOT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates. Orders solicited and promptly attended to.
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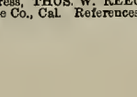
All others are Counterfeit.


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CYLINDER AND COMPOUND CUPS.
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Lubricating and Lard Oils.

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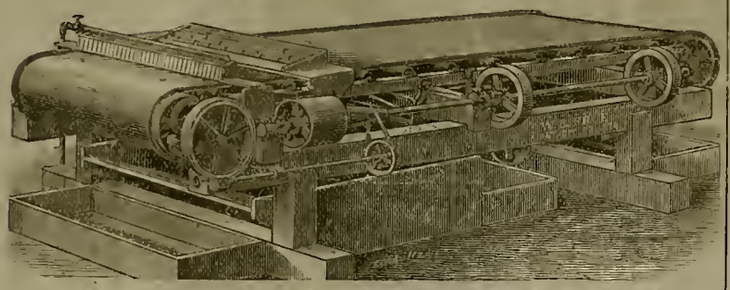

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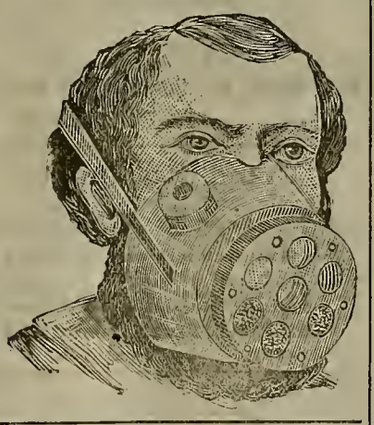

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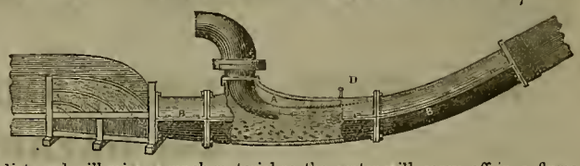

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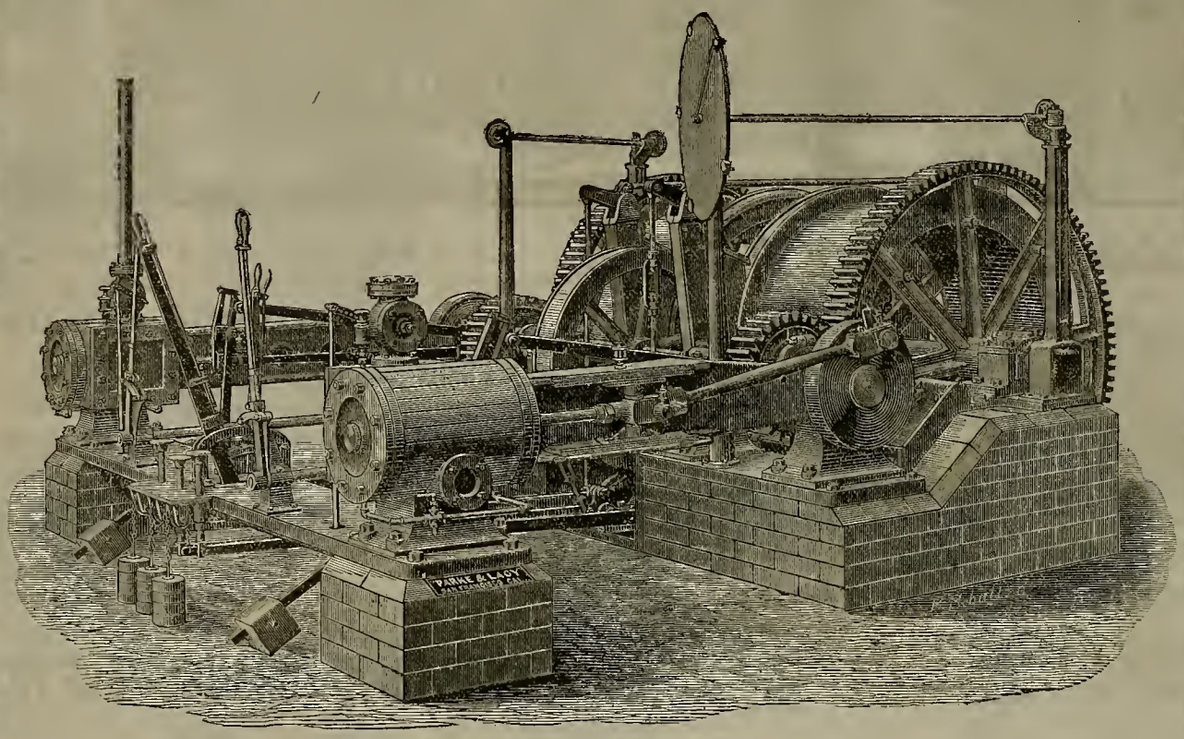

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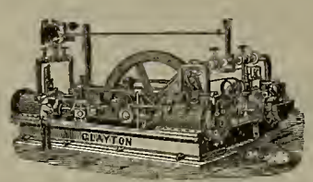

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SAN FRANCISCO, SATURDAY, AUGUST 20, 1881.

VOLUME XLIII Number 8

The Milling of Gold Quartz.

The following paper was recently read before the California State Geological Society, hy Melville Attwood, F. G. S., "On the Milling of Gold Quartz.—Amalgamation:"

When last I had the pleasure of addressing yon, the snhject was on the petrology, or jointed strnctnre of the rock masses of the Bodie mining district. This evening I wish to call your attention to a mnch more important snhject, namely the milling of "Gold Quartz." At the present time the mining commnnity of this State are nsing strennons efforts to make the working of low-grade ores a profitshle husiness, and if any snggestion of mine will in the least assist the matter I shall feel amply repaid.

I hope however, other miners more capahle than myself will communicate the resnlts of their experienco on this subject.

If we search tho records of past times, we shall find that a great deal has been done years ago, which might he applied with great advantage even at the present time, in proof of which examine the drawings and descriptions of them, which I have hrought for yonr inspection. The first or No. 1, (see engraving) I copied from Sir John Pettns' hook on the "Lsws of Metals, &c," pnhlished in 1683, nearly 200 years ago. You will see how much hetter it is calculated to wash gold allnvia than our modern rooker.

An explanation of the engraving, taken from the hook referred to, is as follows:

1. The man that worketh with the rattar.
2. The middle floor whereon that which goeth through the rattar doth fall.
3. The lower floor whereon that which cometh from the middle floor doth fall.
4. The plain receiver of that which falls npon hoth.
5. The person that stands on a hoard and ont of a wheelharrow throws the matter or oar, into the tunnel which guides it into the rattar.
6. The channel in which water doth rnn into the rattar.

"Then some of the gold washers nse npon their hearths the strong timode hlaok and rnsset woolen cloth, over which they do drive their works, hecause the woolen cloth is rough and hairy, so that the small and round grains of gold will remain, and not run forth (as it will from the timode), whereby the gold npon the hlaok cloth may apparently he known, though it be small and little. Others nse instead of the timode or hlack woolen cloths, linsy-woolsy (half linen and half woolen; wrought in the manner as the timodo is), npon which the gold doth stick hetter, and such cloths do last longer, hecanse of the linen that is among the woolen, which doth strengthen it; therefore it is hetter for this work."

For the concentration of sulphurets look at the drawing, No. 2 (see page 121), "Brunton's ore-dressing frame," which I rememher seeing in successfnl operation in the year 1847. The drawings I have copied, were pnhlished in the London *Mining Journal*, 1847. It is very similar to the Frne concentrator now heing so snccessfully introdnced at our different qnartz mills.

A is a piece of prepared oanvas, 30 ft. long, joined at the ends—thus forming an endless hand, with slips of wood fastened transversely on the inside, and making, when stretched on frame and rollers, a snrface of 12 ft. loug and 4 ft. wide, the inclination of whioh is altered to snit the material to he operated on hy the screws, *G G*. *B* is an inclined plane, divided into several channels, in connection with the trough, *C*, into which is placed the ore to he dressed, from which it is washed and distrihuted over the channel, *B*. *D* is a shoot, over which clear water runs; *E* a cistern, or receptacle, where the cleaned or dressed ore is deposited; and *F* another, into which the dirt and waste falls. By the action of the water-wheel, the endless helt is maóe to move oontinnously upwarda against the stream; and as the work is washed on the tahle overhead, *B*, where the atream is increased hy the clean water, which two streama oombined are snfficient to wash the waste over the end of frame into cistern, *F*, while the ore, hy its anperior gravity, resists the force of the stream and is carried npward, heing, while passing hetween the heads, *B* and *D*, snhject to the aotion of the stream of clean water. When the ore thus separated from the waste is carried np past the head, *D*, it is free from all action of water, and adheres to the canvas nntil it tonches the water in cistern, *E*, when it directly falls off, and is deposited in the hottom of the cistern, *E*. Thus, there is a continuons stream of material to he dressed passing over the inclined plane, *B* —a continuons steam of waste going over the end of frame into cistern, *F*—and a continuous stream of clean or dressed ore heing deposited

FIG. 1—MACHINE FOR WASHING GOLD ALLUVIA 200 YEARS AGO.

in cover, *E;* and it is fonnd that no other method yet adopted can either produce the same effect, hoth as regards the high produce of the cleaned ore or the impoverished state of the waste, in which psrticular point the great saving is—as, let the person attending it he ever so negligent, no ore is heing wasted, so long as the water-wheel is at work, while in the old method there is a great qnantity of ore which finds ita way to the tail of the frame through the negligence of the party using it.

The plan of a "trnnking hnddle," No. 3 (see page 121), or a machine for washing the alimea or tailings collected in dama or catch-pits, was an invention of my own, hy which, in 1842, I recovered many thousand ponnds worth of copper ore. It was puhlished in the London *Mining Journal* of that year, and models of it placed in the Mnseum of Practical Geology. It might ho nsed to advantage as a rapid means of treating the tailings that have aconmnlated at tho Comstock, Bodie, and other mining districts.

In this engraving, *A* represents the holes hy which water is admitted; *B*, knives to cut the tough slime and divide the stream of water; *C* is a drnm with wings to work the slime np well; *D*, grates; *E*, hesoms to sweep the grates; *F*, vanes to keep stirring np the slime as it psses into the trunks; *G*, trunks; *H*, stops to regnlate the water in the trnnks; *I*, a hox into which the hesoms sweep the small pieces of wood and stuff too large to psss through the grates.

Fig. 4 (page 121) is the modern rooker or cradle, which is shown simply that it may he compared with the ancient appliance shown in Fig. 1.

The principal ohject in my now addressiug yon, however, is to snggest and recommend the extracting of the

Gold from the Sulphurete

By amalgamation in *wooden barrels*, the same that has heen successfully employed at the St. John del Rey mine, Brazil, for nearly a half a century, in place of the chlorination process now so mnch nsed in this State. I feel assnred hy the former process more gold will he saved, and at a oonsiderahle less cost.

The St. John del Rey mine is owned hy an English Co., and has heen profitahly worked for npwsrds of 45 years. Last year, 1880, in their fiftieth annual report it appears they stamped 63,540 tons of veinstone, and state the cost of milling the same was 3s.11½d. per ton, ahout $1; and that the net profit for that year's workings wss $315,000.

The veinstone of the St. John del Rey mine is a mixture of magnetic, arsenical and common pyrites desseminated in a quartzose gangne, and is composed of ahont 40% of silica, and 60% of pyritic matter—the arsenicsl pyrites carrying the most gold. The smallest grain of gold is rarely seen hefore concentration.

Their Procese of Amalgamation

Is nearly perfect, hut the stamping and concentration very defective, the stamps doing hut little duty, only 1¼ tons per head during the 24 hours. Their plan of concentration heing principally what is called "straking," consisting of a numher of fixed inclined trays 30 ft. in length, and 18 ioches wide, with a fall of one inch to the foot, the trays are covered for the first 16 ft. with hullock's skins tanned with the hair on them, and in lengths of two ft. two inches; helow these are a series of hlankets or haize cloths of the same length. The deposit of sulphurets on the first three skins contains nearly all the gold, and amonnts to ahout 0.42 of a cuhic ft. per ton of veinstone. Stamped, it contains ahout 30 ounces of gold per ton, all of which with the exception of one ounce is in a free state—the ounce of gold heing mechanically mixed with the coarser grains of pyrites.

It is estimated that in stamping and straking, 10% of the total amount of the gold is carried off in suspension hy the water.

Their loss in amalgamation is comparatively trifling, as far as I can gather from their nnmerous reports, and will average less than 4%—the loss of mercury is 0.45 ounces per cuhic foot of sulphurets amalgamated. The apparatus employed for amalgamation of the sulphurets, consists of wooden barrels, four ft. in length, and two ft. five inches in diameter, having a capacity of 20 cubic ft. The charge of sulphurets for each harrel is one ton and a half *free from decomposition*, and 60 lbs. of mercury. There is also a sufficient amount of clean water at the same time introduced to give the slimes the necessary degree of fluidity to enahle the glohules of quicksilver formed to hecome properly incorporated, without allowing them to hecome sufficiently mobile to admit of the settling of the mercury and amalgam at the bottom. The harrels when charged are allowed to rotate from 20 to 30 hours, making 18 revolutions per minute in accordance with the state of the atmosphere.

The contents of the harrels are afterwards washed in an apparatus called a "ssxe," which is used to separate the gold amalgam from the refuse. In this country it might he perhaps hetter to employ separators the same as those used in the different pan mills.

In thcir report of 1880 the resnlts of their trials of

The Cometock Pan Syetem

Was anything hut satisfactory, indeed in the milling for gold that system appears to he too costly for low-grade ores, and not fit for the rich. It is hetter calculated for the treatment of veinstone which contains in the ton from five to ten onnces of silver, and that in a snitshle mineralized condition as chlorides etc.

The attempts to grind the sulphnrets when they contain upwards of 50% of pyritio matter, and to amalgamate the mechanically comhined gold enclosed in the particles of pyrites, at the same time and in the same pan, has not heen attended with success from the earliest attempts, some of which I witnessed in Brazil in 1832, which was then made in an apparatus heing a modification of the Hungarian howl. The St. John del Rey

Sulphurete When Ready for the Barrel

Contain ahont 95% of pyritic matter, and are redneed so fine that 90% of it will pass throngh a sieve having 100 holes to the linear inch.

What I have tried of the Californian sul-

[[CONTINUED ON PAGE 121.]

Geographical Society of the Pacific.

A meetiug of this society was held last week, Prof. Davidson (President) in the chair. Mr. Tb. E. Slevin, on behalf of tbe Executive Committee, reported tbat a hall had beeu rented, furnished and provided with all requirements necessary to carry out the object of the society; tbat a library of geographical works had been donated by members, and tbat the Government at Washington had furnished a large numher of charts and maps of tbe coasts, and the adjacent States and Territories. Many members had joiued tbe society since the last meeting, and a number of persons bad signified their intention to become members.

Reports of Officers.

Tbe Secretary reported that 106 gentlemen had subscribed their names up to date. Of these, 100 were regular members, whose initiation fees amounted to $1,000, the dues to the first quarter to $300, and six life members, $600, making a total of $1,900.

The donations to the society are valued at $500, and it is expected that this valuation will, witbiu the next three months, bo very largely iucreased, as many geographers and explorers are taking a great interest in its success.

Tbe Treasurer reported having expended $870.20 for rent, furniture, stationary, etc. Tbe hills had been audited and paid.

The President stated that tbe Constitution and By-laws had been framed with great care on the basis of the American Geographical Society of New York, the California Academy of Sciences and otber societies of this city.

Tbe Secretary having read the Conetitution and By-laws, Mr. Wm. Lane Booker proposed that tbey be adopted. Tbe motion was seconded by Mr. F. Barton and carried unanimously.

Tbe President expressed his satisfaction that the Society was now fairly launched, and he had no doubt it would prove of great service, not only to the inhabitants of California, to tbe travelers and explorers of tbe Pacific coast who make San Francisco their starting-point, hut also to the navigators of the Pacific ocean. Many of the captains of tbe whaling vessels who had visited tbe Arctic regions would be able to give from time to time much valuable geographical knowledge to this society, and he tbought it would he advisable to make it generally known, that tbey may regard the society's rooms as a rendezvous for information. The society would bave it in its power to render good service to many of the scientific societies abroad, and these societies would reciprocate the services rendered. Tbe Academy of Scieuces had bitherto necessarily gathered all tbe geographical knowledge that had been brought to San Francisco, hut uow tbat the Geograpbical Society had been established they might hope to gleau from all parts of the coast more particularly every item of new information that could be given. For bie part be should make a point of doing all that he could to furtber its objects. He was about to visit the interior for some monthe, and he would contribute all that be could iu a geographical point of view. There was a very large

Field for Geographical Exploration

In the new region acquired by the United States from Ruesia. An immense belt of timber of extraordinary growth throughout tbe Arcbipelago Alexander, was there to be found, wbich, when the forests of tbe more southern regions are exhausted, will prove of inestimable valne.

Tbo President also alluded to the imperfect surveys of the Alaska coast and to the fact that private companies, such as the Hudson Bay company, possessed much valuable information of localitiee which were unknown to the general public and to the Government.

Tbe question as to whetber Plover island was a part of Wrangel Land or an island, was brought up and fully discussed, the President referring to a paper wbich he had presented to this society with a chart.

Mr. Wm. Lane Booker stated that be had just received a letter from Captain Markham, who gave it as bis opinion tbat no fears need he entertained as to the safety of tbe crew of tbe *Jeannette*, for although the *Jeannette* might be crushed iu the ice, they had ample means of protecting themselves and of effecting communication with the inhabitants.

Prof. Davidson remarked that in a conversation with Lieutenant Schwatka, that gentleman had expressed a similar opinon.

The question as to whether or not water could he found on Socorro island, was mooted hy Mr. Booker, who etated that a vessel had touched there and a man was left ashore. An English war-ship had stopped at the island iu order to make a scarch for this man, hut no trace of him could he found, nor had any water been discovered. It was his own impression tbat water did not exist there—recalling the circumstauces of the loss of the *Mathilde*, and the faot tbattwo vessels, the *Freda* and *Lancashire Witch*, sailed from this port in search of the shipwrecked crew. He thought this would he an interesting subject for inquiry.

The Sacramento *Bee* says most of tbe hydraulic miuee are owned hy foreign companiea. The Nevada *Transcript's* statement is falee. Out of the large numher in this county, only one of them ie owned hy a "foreign company," aud that company would have been hetter off, financially, if they had never eeeu a hydraulic claim.

The Scale Insects at San Jose.

Tbe outlook for conquest on the side of the fruit growers against the pests which endanger their industry, becomes brighter when we remember the number of earnest men who are now working as amateur entomologists and unyielding insect-fighters in the different parts of tbe State. A forcible illnstration of this fact comes to us tbis week in tbe ehape of a report made to the Santa Clara Horticultural and Viticultural society, by S. F. Cbapin and D. C. Vestal, two fruit growers of the county. This report was submitted at the last meeting of the society and it fills nearly four long columns in tbe San Jose daily newspapers. There is given a long record of observations on the insect wbich is an undescribed species of *Aspidiotus*, locally known as the "small, round, hlack scale." It aleo describes the results of 22 experiments iu tbe application of different materials in different ways, showing that the committee bas used due diligence in the aggressive departments of its work. We have not space for the introductory notes on tbe insect nor for the enumeration of tbe experimente aiming to destroy it, hut the most practical portion of the report, which is a deduction from all local experience and experiments, will he found valuable everywhere that scale insects have come, and we shall give a etatement of its essential parts.

As the female scale insect has no wings, sbe can, of course, only he spread about by becoming attached to sometbing hy whicb she is carried to different localities; and hy crawling during the short period after hatcbing, before becoming fixed for life. Birds will carry tbem most frequently about an orcbard; and it is tbought tbat one sonrce of danger is little regarded, viz.: carrying tbem about on one's clothing hy brusbing against infested trees. The system of return hoxes aud packagee of any cbaracter, is known to be pernicious, and a fruitful source of the spread of all kinds of noxious insects, whiob either as insects, eggs or larvæ are fastened to tbem and taken into the orchard to he developed in due time. If boxee or packages are returned they should ho dieinfected as soon as received by dipping in boiling water to which is added not less than one pound of potasb to 25 gallons of the water used. Trees procured for transplanting should be washed as eoon as received, witb a strong potash wasb, with not less tban one pound concentrated lye, to tbree gallons of water.

Thorough and constant cultivation of an orcbard should he kept up; and diligent watchfulness of every tree hy the owner himeelf exercised, so that no scale insect sball escape obeervation, and when found the proper remedy should be iustantly applied. All orcbards, even tbough showing no scale, should be wasbed with concentrated lye of the strength of 1 lb. to 3 gallous of water, as this strength will keep treee healthy and free from moss and filth. Where infested with scale insects, the strength of 1 lb. of lye to 1 gallon of water (or not less than 1 lb. to 1½ gallons water) shonld be used. This strength will destroy all scale, and also will completely destroy the eggs and larvæ of the red spider; as found from experiments made, any less strength will not destroy the eggs of tbis mite. Lye should be applied in a spray by the use of a garden syringe, or where large orcbards are treated, the most economical meane is to uee a large harrel or tank placed upon a wagon or eled and drawn through tbe orchard, and the solutiou thrown upon the tree by a force pump, throngb 30 or 40 ft. of hose, to wbich is attached a nozzle baving for ite opening a simple straigbt slit, very narrow in width and one-sixteentb to one-eighth of an inch long. Great care should be observed to cover all portions of tbe tree, as upon its thorongh application depends its success. Care should also be taken to protect the hody from its effects, as it hurns the ekin. Tbe lye is best broken up and dissolved in a small quantity of boiliug water and then the required strengtb obtained hy adding cold watcr. Strong lye should only be used when the tree is dormant—as in any effectual etrength it will burn the foliage. One hundred large trees can be washed thoroughly.

Tbe investigatione of the committee show that where crude petroleum has heen used it kills the tree *if the sap is moving;* where the trce ie *entirely dormant* it may he used perhape without destroying the tree. Crude petrolenm is too heavy and ite uee is not recommended. Kerocene (refined coal oil) in no instance has killed the tree, hut bas destroyed the scale and relieved the tree of its presence, thue enabling it to recover. While not fertilizing the tree, it ie effeotual as a remedy and can be applied at any season of the year if of a high grade (150 test). The best time however to apply it is when the tree ie dormant, and invariably used when the tree is dry; as it will he of no avail if applied to a wet eurface. It should be applied in as fine a spray as possihle, and ae little used as will once cover the tree, taking care that the entire tree is sprayed. In this way high-grade kerosene is recommended. A lower grade (100 test) may be used *only when the tree is dormant;* the hest time for application is in the autumn after the leavee bave fallen. Concentrated lye hae proved itself, where used of sufficient strength, to he thoroughly reliahle and effectual, and has the great property of fertilizing the tree and eoil, ae potash ie one of the natural conetituente of both, and is required for the health of the trce. Its use is therefore recommended—60 lbs. of the concentrated lye of tbe American Lye Co. ie equivalent to 100 lbs. of Commercial potash.

Where trees are very had it is recommended to firet apply kerosene in the autumn and then by the time tbe sap starts late in winter apply lye 1 lb. to 2½ gallons water. For summer washes (other than higb-grade kerosene) to be best applied about the first of June. The following are recommended:

Whale oil, soap oil and sulphur. Mixtures, 1 lb. to 1 gallon water; or, soft soap 1 lb., sulphur 1 lb., tobacco 1 lb., added to three gallons water, are all that can be recommended.

Tbe different proposed means of destroying the ecale, hy boring tbe trunk of the tree and putting in the hole preparations of various sorts have been proven ineffectual, as the committee has observed tbat where tried no effect at all has been produced and tbe trees are etill alive with scale. So far as they can determiue no remedy can be effectual, which does not directl reach the scale, and through its penetrating power destroy the ineect itself. The committee's experiments show that young orcharde may be kept free from ecale by constant care, and where invaded, tbe insect at once destroyed. Old orcharde infested very seriously may become cleared and the trees giveu new life and vigor. It is the firm conviction of tbe committee that could nnited action he secured, the pest could speedily be destroyed and stamped out of existence.

Pacific Coast Harbor Improvements.

Tbe annual report of Col. Mendell, of the United States Board of Engineers for the Pacific coast, having charge of the river and harbor improvements in California, has been sent on to Washington. The following is the substance of his report on tbe most important works in California:

Oakland Harbor Improvemente.

At the beginning of the past fiscal year, July 1st, 1880, the operations on this harbor had been suspended for three years, on account of tbe restrictione of tbe law requiring that a title shonld be acqnired by the United States before work could he resumed. In June, 1880, Attorney-General Devens gave an opinion tbat tbe United States already had fnll rights, and in accordance with bis opinion tbe work was resumed iu tbe fall of tho same year. During tbe tbree years' snspension of work on tbis barbor, tbe jetties bad settled considerably, and in some placee falling below tbe level of low water. The effect of this was a reduction iu tbe depth of the cbannel from 10 to 8½ ft., for a distance of several hundred feet. Up to tbe 30th of last June tbe dredging was not sufficiently advanced to restore the original depth of 10 ft. During the past year tbe operations were continued for carrying out the original plan of improvement, wbich consists of the extension of rubble stone jetties from tbe Oakland shore to deep water in San Francisco bay. The north wall has heen raieed to high-water mark for a distance of 5,700 ft., and the south wall has been raised over a distance of 930 ft. to tbe bigbt of five ft. above low water mark. Tbe work of dredging was begun last April, and still continues. Wben the contracts now in force for dredging are carried out, it is the intention of Col. Mendell to use all the available fnnds to continue the dredging, and the operations of the year will be cnnfined to the execution of tbie work. The future operatious will be the prosecution of the excavation of a tidal basin to connect tbe San Antonio and tbe San Leandro estuaries. Col. Mendell thinks the present year will probably pnt the jetties in condition so as not to need any attention for eome yeare to come. Tbe channel between the jettiee will require gradual enlargement, and the same is true of tbat portion of the cbannel lying in front of Oakland. It does not, however, he says, seem probable that tbe enlargement of the channels will be continued for several years. About $55,000 was expended during the past year, leaving about $219,000 available from the past appropriations for future operations. Col. Mendell thinks tbat $300,000 can be profitahly expended during the year ending Jnne 30, 1883.

Wilmington Harbor Improvements

The principal operations of the past year bave consisted iu dredging for the purpose of widening the channel through the reef, whicb lies west of Deadman's islands. The depth of the channel continues to improve, and there ie now a good channel over ten ft. deep at low water. Colonel Mendell saye it ie quite possihle to increase the depth of this channel to 15 or 16 ft. at low water by the excavation of the reef and hy the extension of the jetties. A careful estimate ebowe that the probahle cost of tbese operations will probahly he ahout $292,000, which snm conld he advantageously expended in two years, if the appropriatione were made. Col. Mendell in his report eays that the increase of the population in Southern California and the extension of the railroads in Arizona and New Mexico, have given increased importance to Wilmington harbor, and tbere eeems to be more reason uow for a harhor 15 ft. deep than there was for 10 ft. deep at the time the improvements were commenced. The operations for the coming year will he covered by tbe contracts now in force. They consist mainly in placing the etone on the jettiee. About $39,000 wae expended during the past year, and about $29,000 remain from the past appropriation, which ie availahle for the coming year'e work, and which eum ie not sufficient to do all that is desirable. Mendell thinks that $650,000 can he profitably expended during the two years ending June 30, 1883.

Sacramento River Improvements.

Tbe operations on tbe improvement of the Sacramento river for tbc past year were confined to removing and destroying snage from the upper river. As a result of these operations, tbe river was put in a better condition last summer tban it bad heen for years, and the movement of an unusnally large wheat crop was greatly facilitated. Tbe operations of the coming year will be principally tbe employment of a new snag-boat during the greater part of the year, if tbe etage of the water permits, in removing enage and cleaning tbe channel. No exact estimate can be made of the numher of obstructione likely to he met, but it is thought tbat a year'e work of the snag-boat will be necessary to put the channel in good conditiou. When this is once done, the yearly accumulations will require removal. In addition to this work, provision for better depth in tbe ehoal places will have to he met. Tbe improvements projected for the lower river remain yet in sheyance, the demands for the upper river having up to this time left notbiug available for otber purposes. The Six-mile Bar, above Sacramento, the report says, in all probability, will require improvement in tbe coming year, aud will necessitate an expenditure of $12,000. During the last year $65,880 were expended on the river, leaving $50,500 of the past appropriatione available on July 1, 1881. The report states that $100,000 can be profitably expended on work during the fiscal year ending June 30, 1883.

San Joaquin Improvements.

The operations on the improvements of tbe San Joaquiu river last year were confined to the dredging of tbe channel at different pointe on the river. Tbc work being either not begun or uufinished at the close of the year, the prosecution of tbis dredging will constitute the operations for the coming year. The report states that no survey of the San Joaquin river as a wbole bas yet heen made, and for that reaeon no estimate of the permanent improvements has been possible. It recommends the survey of tbo river from Tulare lake to the moutb. Only $8,000 was expended on this work last year. Fifty thousand dollars was available on July 1, 1881, from tbe past appropriations, and $50,000 is the amount recommended that can be profitably expended during the year ending June 30, 1883. The work of improving

The Humboldt Bay and Harbor

Has not yet begun. At tbe close of last year, the appropriation of $40,000 by the act of Marcb, 1881, was first made for tbe Humboldt bay and harbor.

It is proposed to expend, during tbe coming year, three-fourtbs of this amount in dredging, mainly in front of Eureka. It is estimated tbat over $95,000 will be required for tbe completion of the projected work, and that $50,000 can be profitably expended during tbe year ending June 30, 1883.

Garfield District.

A New Mining Dietrict in Nevada.

A correspondent of tbe *True Fissure*, writing from the above-named district, says: Garfield District is situated on the south side of the Belleville and Walker Lake road, about midway between the lake and New Boston. Our district, as yon are aware, is young, hut we think it none the worse for that. There are about fourteeu very promising locations made at tbis writing. Tbc formation of the district is slate and porphyry, with some lime. Tbe veins are generally of the contact order, the two first formations forming the walle. Messrs. Johl and McDonald are working a number of their locations, and will continue to develop them as rapidly as convenient. They have quite a number of tons of ore on the dump that will average from $600 to $700 per ton. The deepest shaft in the district is ou the Fairmount No. 2 mine, heing about 40 ft. in depth. The vein has improved in size, as well as in quality of the ore, from ten ft. dowu. The ore is black metal and cbloride. The veins are in size from three to ten ft. in width, tbe smaller veins being much richer than tbe larger ones. They are also working the Fairmount No. 1 and the Lottie mines, both of wbich are looking very well and producing oro. They have two other claims tbat look well on tbe surface, hut are not working them as yet.

Water and timher are scarce articlee, the nearest water heing at New Boston or Walker Lake, about fifteen miles from either place. I think, however, a good supply conld he obtained within four miles hy sinking a well. There is plenty of scrubby cedar for all preeent purposee. There are some twelve miners in the camp, and all are at work. A good ebow preeente itself for prospecting if one hae animals to pack or haul water. Grass ie plenty in the mountaine, and the animals will do well if watered.

Col. Davies, eaye the Marysville *Appeal* of July 30tb, leaves for California to-day to take part in the May Lnndy cnit, which will he opened iu the Snperior Court of Mono county on Monday next. At Reno he will he joined by Gen. Clarke who is also in the caee. The cuit is brought by J. M. Miller *et al.*, to recover a half interest in the May Lundy, Monitor, Lake View and Bryant mines, situated in Homer district. George W. Butterford *et al.*, are the defendante. The suit involves $10,000,000.

MECHANICAL PROGRESS.

Progress in Iron Casting.

But little change has been made in the *methods* of simple iron castings during the last half century, but the *practice* has been wonderfully improved during that time. The progress which has thus been made, which is great, has been due to superior materials for molding, better fuel, better quality of iron and superior skill in practice. The result has been such as to almost elevate iron founding to the plane of the fine arts, and various art works in bronze, silver and brass are now reproduced in iron with most striking art effect. This improvement was first noticed in the rival efforts of stove manufacturers, many of whose castings are now made almost as thin and smooth and sharp in outline as can be produced by the most skillful workers in bronze. Antique swords, ornamented helmets, Japanese bronze trays, with foliage ornamentation, and many other ancient works of art are now reproduced in great number.

According to the *Industrial World*, the best American iron castings are fully one-third stronger than the best English. The cause for this favorable difference between the American and British castings is said to lie in the quality of the iron employed in their construction. The result of this difference in quality is most plainly shown in the superior lightness and finish of our manufactures in iron. We do not mean to say that there never have been any castings in England as fine as those we produce here, but we freely assert that the majority of castings that there pass for the best are inferior in quality to those made here. We might also add that castings made at the lake cities of Cleveland, Chicago, Racine and Milwaukee, as a general thing, are superior on many accounts to those made in the Eastern States. This is the testimony of workers in iron. They say that the best grades of Eastern castings are more or less porous or flaky, and that numerous little holes or specks are discoverable, which impair their appearance as well as their strength. The Western castings—and we only refer to the highest grades—have a fine, close structure, and are soft and easy to work. In fact, they can be milled nearly as easily, and without annealing, as can the Eastern castings after annealing. * * *

But while saying so much for the West we are constrained to make the admission that in point of finish the Eastern makers have some advantage over most of our Western foundries. The Eastern molders have a faculty of turning out castings with sharp, well defined surfaces, and their work is truer and more uniform than much of our Western work. Then many of our Western foundries have yet to learn the art of pickling which is so desirable in making many descriptions of castings. But we belive that our Western foundries are making rapid progress in improving their work, and we predict that the time is not distant when the West will compete with East in finish and style of work, as they already do in the quality of their productions. We, in fact, have a few foundries already in the West that are formidable competitors of the Eastern makers, and it is fair to suppose that we shall have many more.

What Becomes of Condemned Boilers.

If the secrets which are locked in the breasts of the junk dealers of Philadelphia could be revealed, a startling tale might be told. In different parts of the city there are sidewalks and yards which are occupied from January to December with boilers which have been placed under the han. As fast as one disappears another takes its place. Sometimes thirty, forty, or even fifty, may be counted in a single yard. A few months later another lot have taken their places. Where have they gone? Some up through the State, some to Jersey, some to Maryland; but the majority might be found in use right in Philadelphia. It is a notorious fact, freely admitted by every man in the junk trade, that a boiler may be condemned, perhaps purely on account of a little capriciousness on the part of the inspector, removed to a junk shop, painted up, perhaps a soft patch or two put on some place, then resold, built in position, and passed at a pressure which, if allowed in the first place, would have saved the original owner the necessity of replacing it. As a matter of fact, there is absolutely no method by which an inspector can identify a boiler a second time. Very few condemned boilers are broken up for scrap. When the condition of one is so utterly bad that even a junk man is afraid to recommend it to a city user, he generally finds no difficulty in finding a purchaser in some other part. Old boilers which would not pass muster at any pressure within city jurisdiction are regularly shipped across to Jersey, down to Maryland, or up the State.—*Philadelphia Record.*

AN INGENIOUS DEVICE.—The experiment of running a locomotive without brakes has just been successfully tried by the Delaware, Lackawanna and Western Railroad Company. The locomotive is of ordinary pattern, but has an extra pipe leading from the boiler to the steam chest, by which power can be applied against the piston, checking the engine and enabling the engine to reverse without "hauling over."

Brick Foundations for Machinery.

Experiments and observations concerning the strength and utility of brick foundations for machinery have been summarized by the age of industry. Trautwine is quoted as saying that a rather soft brick will crush under a weight of 450 to 600 lbs. per square inch, or about 30 to 40 tons per square foot, while a first-rate machine-pressed brick will require from 300 to 400 tons per square foot. This last is about the crushing limit of the best sandstone—two-thirds as much as the best granites or roofing slates. But masses of brick-work, he notes, will crush under much smaller loads than single bricks. In some English experiments, referred to by this author, small cubical masses only nine inches on each edge, laid in cement, crushed under 27 to 40 tons per square foot. Others with piers nine inches square and two ft. four inches high, in cement, only two days after being built, required 44 to 62 tons per square foot to crush them. Another, of pressed brick, in best Portland cement, is said to have withstood 202 tons per square foot, and with common lime mortar only one-fourth as much.

The same authority, however, is careful to add the statement that cracking and splitting usually commence under about one-half the crushing loads. To be safe, he recommends that the loads should not exceed one-eighth or one-tenth of the crushing load; and so also with stone. Moreover, he notes these experiments were made with low masses, but the strength decreases as the proportion of the hight to the thickness increases. He cites the following example: The pressure of a brick shot-tower in Baltimore, 246 ft. high, is estimated at six-and-a-half tons per square foot; and in a brick chimney at Glasgow, Scotland, 468 ft. high, at nine tons.

Prof. Rankin calculates that in heavy gales this pressure is increased to fifteen tons on the leeward side. The walls of both are, of course, much thicker at the bottom than at the top. With walls 100 ft. high, of uniform thickness, the pressure at the base would be five-and-four-tenths tons per square foot. He prudently concludes that with our present imperfect knowledge on this subject, it cannot be considered safe to expose even first-class pressed brickwork, in cement, to more than twelve or fifteen tons per square foot, and good hand-molded bricks to more than two-thirds as much.

Unfinished Tools.

Some time ago the writer was asked, by letter, why our machine tools are not sent ready to operate, barring the inevitable setting-up, leveling, hanging counters, and adjusting belts. Since the reception of the letter he has made inquiries of builders of tools, and so far has failed to get a satisfactory reply. In several instances it is a "*Cosas d'Espana*," an old custom, that should not be changed because it *is* a custom. When in Spain the traveler asks, "why is this thus?" he is met by the reply it is a custom of Spain. In other replies, the writer was informed that the operators of the new tools preferred to put their tools into shape to suit their own demands.

There appears to the operative and observant mechanic no special demand for unfinished tools, especially now, when there is such a demand for operative machinery. When a man buys a lathe, for instance, locates it, adjusts the counter shaft, and puts on the belt, he ought to have a tool ready for work. But, instead of that, he finds both centers lacking a point. They must be turned to gauge before a stud or shaft can be suspended between centers and worked. If there is any reasonable reason why the centers of a lathe are not ready for use when the lathe is placed *in situ*, the writer has not yet found it.

In most shops where the lathe is built, the test of agreement between the axes of the spindles and the ways of the lathe is determined by very severe tests—the centers of head-stock and tail-stock are proved by trial and determinate shafts, that fit alternately into one and the other center holes of the respective spindles. This trial not only determines the agreement of the two spindles, but also determines the agreement of the centers of each spindle, with the ways that guide the carriage that carries the cutting tool. It is evident, therefore (if the entire work has been properly done), that the centers of the lathe might as well be finished to the proper angle of 60° as to allow the purchaser the luxury of reducing them from a cylindrical to a cone-like form. It seems that there is room for improvement in this old-time practice.—*Boston Journal of Commerce.*

SINGULAR PROPERTY IN STEEL.—It is well known that a steel that is very flexible when cold breaks at the blue annealing temperature. It has generally been considered that the purer the iron is the less subject it becomes to this defect; but the workmen of the Ural Mountains, who use iron of remarkable purity, have often observed the same fact. Mr. Adameon has found that the metal becomes powdery at a temperature between 260° and 370° C. (500° and 698° Fah.) or the temperature at which willow twigs take fire. This phenomenon seems to explain a large number of accidents, as, for example, the breaking of tires under the action of brakes and the fraction of riveted molds and of machine arbors which become heated by friction.—*Ann. du Gen. Civ.*

SCIENTIFIC PROGRESS.

The Comet—Scientific Observations.

When the comet, which has just now passed out of sight in the northern heavens, first made its appearance, much confidence was felt that so large and conspicuous an object would afford an opportunity of adding much to our knowledge of those wandering bodies, by applying to it the new means of research, which have recently been devised in improvements in photography and in the use of the spectroscope. It was hoped that by the united action of these two devices many peculiarities might be obtained, invisible to the eye by any of the ordinary aids hitherto employed. But, owing to various causes, the result has not been very satisfactory.

Prof. Henry Draper, of New York, who has of late made stellar spectroscopy a specialty, and who has achieved so much success in this direction, that, in his recent photographs of the nebula of Orion, he has depicted details so minute as to equal in faintness stars of the 14.7 magnitude, has made persistent efforts to secure the best possible photographs of the comet's spectrum. His efforts were much impeded by unfavorable weather; but he has nevertheless succeeded in accomplishing something.

On an exposure of 162 minutes, the tail of the comet impressed itself to the length of nearly 10°—fully as long as it was visible to the sharpest unaided eye.

Three photographs of the spectrum of the nucleus under exposures of 180, 196 and 228 minutes were also obtained. It will require some considerable time before the results and discussion of these photographs can be fully determined. But enough has already been ascertained to lead to the conclusion that a large proportion of the light from the tail is reflected light, and that carbon constitutes an important element in the constitution of the nucleus. Other elements are also undoubtedly present.

The observations by Professor C. A. Young at Princeton were made under a very tantalizing state of weather, and, with only one exception, none of them exceeded sixty continuous minutes. Professor Young appears to have paid particular attention to a study of the jets which issued from the nucleus, the spectrum of which, when isolated—a very difficult thing to attain—was found to be continuous, indicating that the body under examination is an incandescent solid, although it may be a liquid or gas under a high degree of compression. The spectrum of the tail was also continuous, but overlaid by a banded spectrum, and corresponded to the spectrum of the coma—the bands indicating the presence of gases in a condition of great heat and tenuity.

Mr. William Harkness, of the Naval Observatory at Washington, examined the comet for polarization with very unsatisfactory results. The same observer remarks that notwithstanding the brightness of the nucleus, it gave a spectrum very ill-defined and difficult to measure. Mr. Harkness also remarks, in his report, that it is a matter of interest to note that on or about the 20th of June, two or three days before the comet became visible, the earth must have been in the immediate vicinity of the comet's tail; but his calculations have not yet been determined with sufficient accuracy to enable him to state definitely as to whether our orb actually passed through the tail, as it did on a similar occasion some thirty years ago.

Professors Wilson and Stone, of the Cincinnati Observatory, have announced that on the evening of July 8th the comet was seen to divide into two bodies, as Biela's comet did some years ago, the new and smaller comet appearing directly over the old one, but invisible to the naked eye. Two days after, on the 10th of July, Professor Hall, of the Washington Observatory, examined the comet with the large 26-inch refractor, and Professor Eastman at the same time using the 9-inch instrument, but neither of those gentlemen were able to see any indication of the reported division of the nucleus.

In this connection it may be well to note, as a possible explanation of the above, some observations made by an English astronomer June 29th, and reported in *Nature* of July 7th. It appears from the report, as above, that on June 29th the comet passed over a star of the eighth magnitude. We quote: "Definition very good and tranquil. As the star became involved in the jet it gradually increased in size, and, when seen through the brightest part of the jet traversed, resembled an ill-defined planetary disk about 3″ in diameter. At this moment the comet seemed to have *two* nuclei similar in aspect and brightness."

If a similar phenomena happened at the moment the Cincinnati astronomers were observing, they might possibly have been led into the error of a supposed division of the nucleus.

DECOMPOSITION OF NITRATES BY DECOMPOSITION IN THE DARK.—In plants which grow in the dark, although there is a regular organization and development of stalks, roots and appendages, there is a persistent elimination of a portion of the material which was contained in the seed. The tissue of the organs which are developed under a shelter from light is firm and strongly impregnated with a liquid which has a sensibly acid reaction. The cotyledons are, therefore, provided with the principles which are necessary for the life of the embryo; but nocturnal vegetation is unable to fix the carbon of the carbonic acid which is in the air. Boussingault has experimented in order to find whether this impotence extends to the fertilizing substances, which the roots commonly draw from the soil; if, for example, nitrogenous compounds, such as the nitrates and the ammoniacal salts, are assimilated. He immediately found that if a measured quantity of these salts is added to a sterile soil, a considerable portion disappears entirely, and only a part of the quantity is found in the growth. He therefore concludes that a soil which had been rendered entirely sterile contains traces of organic substances after vegetation in the dark. These substances are probably due to an excretion from the root, which exercises a destructive action upon the acid of the nitrates that were added to the soil.—*Ann. de Chim. et de Phys.*

SCIENCE IN CHINA.—The interest which the Chinese are taking in modern science and culture is not confined to the fact that they are sending great numbers of their young men to this and other countries for a liberal education, for they are also establishing schools of science and literature in their own midst, modeled after those of foreign nations and partly under the conduct of foreigners. They are not only apt as scholars—as imitators—but they are also beginning to strike out as original thinkers. As a case in point, a Chinese physicist, as reported in *Nature*, has recently asserted that "the law, which is commonly accepted, and which states that the octave of any note may be produced by doubling the length of a musical cord or tube, is strictly true only for cords. He says that experiments with tubes of different lengths and diameters have led him to the conclusion that the ratio of length is as 4 to 9, instead of 1 to 2." Several English and American scientific treatises have already been translated and published in the Chinese language, and it is probable that the time is not far distant when we may find valuable original publications in the same language.

ELECTRIFIED CLOTH.—In a wax-cloth manufactory at Griesheim, near Frankfort, the finished pieces of wax-cloth are hung up to dry in an artificially-heated room, being supported in successive folds on wooden bars placed across near the roof, and the lower parts being about a yard above the floor. The air is kept about a day at the temperature of 40° to 60° C. by means of the furnace gasses passing through earthenware pipes in the ground, but also and especially, an air-current heated by these. On opening the place, (the heat having been shut off for a short interval), the wax-cloth is found strongly electric. The boys go under to have their hair set on end, and a distinct shock is received on touching the cloth, more or less strong according to the size of the piece. The explanation, as Herr Krebs says, is doubtless to be sought in friction by the hot air on the wax-cloth in its rapid passage through the room. This is the more probable, since it has been noticed by the work-people that the electric shocks are more violent when the drying occurs in calm weather, which favors the passage of the air-current through the room.—*Ex.*

INVERSE ELECTRO-MOTIVE FORCE.—LeRoux has published a simple process for showing an inverse electro-motive force in the voltaic arc. It consists in extinguishing the arc by opening the circuit and immediately re-establishing, by hand, the communication between the two carbons through a galvanometer. This shows the existence of a current going from the negative to the positive pole between the heated carbon points, and in the contrary direction in the galvanometer. Hence arises the difficulty of illuminating two or more arcs in a continuous current, since it is necessary to overcome the same inverse force for each arc. Magneto-electric machines, with alternating currents, profit by the existence of this inverse current, and this is one source of their great advantage over ordinary batteries.—*Comptes Rendus.*

DISTILLING ALCOHOL BY ICE.—Raoul Pictet, of Geneva, so well known for his discoveries relating to the liquefaction of gases, announces the discovery of a method of distilling alcohol by ice. Two kilograms of ice are needed for the production of a liter of alcohol; that is, for the distillation of 110 gallons of alcohol, a little less than a ton of ice will be required. The cost of production will include only coal for working the steam engine which drives the air-pump, and the sulphuric acid, the evaporation of which produces the ice. M. Pictet declares that this will notably diminish the expense of distillation, and suggests that the excise on alcohol should be proportionally increased.

ABSORPTION OF OXYGEN IN COAL MINES.—The Belgian Academy of Sciences has received a report on the researches made by M. Fabre regarding the diseases to which coal miners are especially liable. He finds that, as coal absorbs rapidly up to 100 times its own volume of oxygen, the air which the miner have to breathe is deprived of oxygen to a hurtful degree; the atmosphere of a mine is also further vitiated by the gaseous carbon compounds given off by the slow combustion of the coal. M. Fabre concludes that a supply of air is more essential than that of light, and even the best ventilated mines require better ventilation.

IT is said that an addition of 3% to 5% of glycerine is sufficient to keep indigo extract dry for years, without having the least influence on the brightness of the product.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 28	Week Ending Aug. 4.	Week Ending Aug. 11	Week Ending Aug. 18
Alpha	3.85 3.50	3.90 3¼	4.05 3¾	4¼ 3.85
Alta	4.65 4.10	4.15 3¾	4.05 3.90	4.35 4.10
Andes	1.55 1.40	1.45 1.30	1.45 1	1.40 1
Albion	3.45 1.65	1¾ 1.40	2.10 1.55	2.10 1.80
Argenta	10c	5c	15c	....
Addenda	15c 10c	10c 5c	30c 15c	....
Belcher	3.15 2.30	3.10 2.80	3.10 2.85	3¼ 2.90
Belmont	50c	....	....	....
Best & Belcher	11¼ 9¾	11¼ 9¾	10¾ 9¾	13 10¾
Bullion	55c 50c	60c 45c	50c 45c	70c 50c
Bechtel	1.80 1.70	1.45 1.20	1.45 1.30	1.30 1
Bel Isle	....	25c	20c 15c	20c 15c
Bodie	.... 5¾	5¾ 6¼	7 7	10¼ 7¾
Benton	1.15 1	1 90c	95c 90c	1 95c
Bulwer	2.80 2.70	2¾ 2¼	2¼	3¼ 3
Boston	40c	40c 25c	30c	30c 25c
Black Hawk	10c	5c	10c 5c	30c 5c
Belvidere	....	....	45c	50c ....
Booker	....	....	....	....
Caledonia	20c 10c	15c 10c	40c 10c	40c 30c
California	80c 70c	90c 70c	1 90c	1.05 90c
Challenge	....	75c	90c 75c	95c 90c
Chollar	2¾ 2.13	2.20 2.10	2¼ 2.10	3.10 2.15
Confidence	3.90 3.60	3.70	4 3¾	4¼ 4¼
Con Imperial	15c 10c	15c 10c	15c 10c	20c 15c
Con Virginia	2.20 1.95	2.15 1¾	2 1.85	2.35 1.40
Crown Point	2.15 2	2.05 1.80	2¼ 1.90	2¼ 2
Columbus	....	....	....	....
Champion	....	....	....	....
Concordia	....	....	75c 50c	1.60 1¼
Concordia (Va)	....	....	....	....
Con Pacific	30c 25c	25c 20c	40c 20c	70c 50c
Derbec	....	....	....	....
Day	2.45 2.15	2¼ 2¼	3.65 2¼	2¼ 2
E. Mt. Diablo	15c 10c	15c 10c	15c 15c	15c ....
Eureka Con	31¼ 28¾	33 25	25 22¾	29 28
Exchequer	1.40 1.10	1.15 1.05	1.15 1.10	1¼ 1.10
Endowment	....	....	....	....
Grand Prize	30c 25c	25c 15c	20c 15c	15c 10c
Golden Gate	2.60 2¼	....	2¼	2.80 2¾
Goodshaw	75c 40c	50c 40c	45c 40c	65c 55c
Gould & Curry	5¾ 4.50	5¾ 4¾	5¾ 4.80	7¾ 4.35
Hale & Norcross	3.45 3.15	3.20 2.95	3.10 2.95	4.30 3.30
Head Center	85c 80c	95c 90c	....	1 ....
Hussey	....	....	....	....
Independence	....	5c	....	....
Julia	40c 35c	40c 35c	30c	40c 30c
Justice	.... 70c	80c 75c	85c 75c	90c 80c
Jackson	50c	50c	75c 50c	....
Jupiter	....	....	10c	20c 15c
Kentuck	2¾	2¾	3 2¾	3 2¾
Kossuth	....	....	....	....
Lady Bryan	....	....	....	....
Lady Wash	25c 15c	20c	25c 15c	20c ....
Leviathan	....	....	....	....
Leeds	....	....	....	....
May Belle	....	....	....	30c ....
Modoc	....	....	....	....
Manhattan	2¾	2	2	2 ....
Martin White	....	....	25c	....
McClinton	....	....	....	20c 10c
Mono	3.05 3	2.70 2¾	2¾ 2.30	4.35 2.65
Mexican	7¾ 7¾	8¼ 7¾	6¾ 7¾	9¾ 8¾
Mt. Diablo	7 5¾	5¾	 7	5¾
Morning Star	....	....	....	....
Mt. Potosi	....	....	....	....
Noonday	70c 55c	1 75c	1 90c	1¼ 1.10
New York	5c	10c 5c	10c 5c	20c 10c
Northern Belle	17 15¼	15¾ 12¾	15 14	15¾ 14¾
North Noonday	25c 10c	55c 50c	55c 50c	90c 55c
Navajo	.... 80c	75c	75c 70c	65c ....
Occidental	1.35 1.30	1.40 1.35	1.35 1.30	2 1¼
Ophir	5¾ 5¾	5¼ 5	5¾ 5	5¾ 5¼
Original Keystone	....	....	....	....
Overman	1.40 1.15	1.30 1.05	1.20 1.10	1.40 1.05
Oro	80c 70c	65c 45c	55c 50c	70c 45c
Paris	....	15c	....	40c ....
Potosi	2.80 2.60	2.80 2.45	2.65 2.45	3¼ 2.56
Queen Bee	....	....	....	10c 5c
South Bulwer	....	....	....	30c 25c
Savage	2.85 2.55	2.80 2¼	2¼ 2.40	3¼ 2.40
Seg Belcher	7	....	5¾ 5	6 5
Sierra Nevada	9¾ 9	9¾ 8¾	9¾ 8¾	13¾ 8¾
Silver Hill	20c 15c	15c	15c 10c	20c 10c
Silver King	21¼ 21¼	20¾ 20	20¾ 20¼	20¾ 20
Succor	....	....	....	....
Summit	....	30c 25c	25c 25c	.... 50c
Scorpion	1.15 1.10	1.35 1.05	1.40 1¼	1¼ 1.35
Solid Silver	....	....	....	....
South Bodie	5c	5c	....	10c ....
South Standard	....	....	....	....
Syndicate	40c 30c	40c	50c 40c	90c 45c
Tioga Con	40c 35c	35c	25c	1.05 40c
Tiptop	5¼ 4.95	5¾ 5¾	5¾ 5¾	6 5¾
Tuscarora	....	....	....	.... 20c
Union Con	10¾ 9¼	9¾ 8¾	10 9¾	12 9¾
Utah	7 6¼	8¾ 7¼	8¾ 8¾	11¼ 8¾
Ward	....	....	2.40	2¼ ....
Wales	1.05 1	1.10 1	1.10 50c	80c 50c
Yellow Jacket	4.70 4.30	4.55 4.05	5¼ 4.40	6¼ 4.95

Sales at S. F. Stock Exchange.

Thursday A.M., Aug. 18.

150	Alpha	4.40@4¾	
850	Alta	4.30@4.20	
295	Andes	1.35@1.40	
400	B & Belcher	12@13	
785	Benton	1@75c	
170	Belcher	3¼@3.20	
315	California	1.05	
630	Con Virginia	2.30@2.35	
500	Chollar	2.85@3.00	
250	Crown Point	.21	
2100	Con Imperial	.20@15c	
900	Caledonia	.40c	
170	Exchequer	.11	
1090	Gould & Curry	.7¼@7¾	
100	Golden Gate	.3	
290	Hale & Nor	.4¼@4.35	
150	Justice	.85c	
600	Julia	.40c	
280	Mexican	.9¾	
360	New York	.15c	
750	New Wells Fargo	.18c	
430	Ophir	.6¾@6¾	
170	Occidental	.2@1.95	
1200	Overman	.1.40@1.35	
915	Potosi	.3.40@3¾	
1295	Savage	.2.55@3	
1405	Sierra Nevada	.13@13¼	
30	Seg Belcher	.6	
355	Scorpion	.1.70@1¾	
450	Silver Hill	.10@15c	
800	Sutro	.25c	
530	Union	.11¾@12	
220	Utah	.11¾@11¾	
580	Yellow Jacket	.5¼@6	

AFTERNOON SESSION.

600	Addenda	.25@20c	
200	Albion	.1.85	
390	Bodie	.8¾	
100	Belding	.10c	
100	Bechtel	.1.10@1.13	
200	Bodie Tunnel	.3.60@3.55	
50	Black Hawk	.25c	
50	C Pacific	.70c	
70	Day	.2.45@2.40	
3700	Holmes	.60c	
100	Head Center	.1	
100	Jupiter	.15c	
305	Mono	.3.50@3.80	
250	McClinton	.10@15c	
550	N Belle Is	.40c	
125	Noonday	.1	
200	N Noonday	.60c	
250	Oro	.45c	
600	S Bodie	.5c	
50	Summit	.25c	
200	Syndicate	.50@50c	
100	Silver King	.20@20¼	
200	S Bulwer	.10c	
500	Tioga Con	.50@45c	
100	Tuscarora	.20c	
100	Tiptop	.5¾	
30	Wales	.75c	

Bullion Shipments.

We quote shipments since our last, and shall he pleased to receive further reports:

Germania, August 8th, $2,500; Hananer, 8th, $2,600; Ontario, 9th, $7,771; Germania, 10th, $5,000; Bullion, 10th, $6,750; Jay Gould, 10th, $3,650; Barbee & Walker, 10th, $1,948; Ontario, 10th, $12,864; Barbee & Walker, 12th, $1,-954; Hananer, 12th, $2,500; Germania, 12th, $3,500; Mayflower, 12th, $5,310; Eureka Con., 10th to 12th, $13,229.98; Northern Belle, 13th, $10,442.70; Navajo, 16th, $5,500; Star, 12th, $3,727.35; Bodie Tunnel, 16th, $4,000; Silver King, 10th, $27,400; Mt. Diablo, 10th, $10,081.-34; Bodie Con., 15th, $7,768; Gold Hill (Idaho), 10th, $36,189; Christy, 14th, $1,816; Western, 9th, $12,087.56; Northern Belle, 10th, $6,026.-25; Mt. Diablo, 5th, $11,318.16; Bullionville, 13th, $2,388; Germania, 13th, $3,400; Jay Gould, 13th, $1,350.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Aurora M Co	California	3	10	July 5	Aug 6	Aug 31	P Conklin	635 Market st
Addenda M Co	California	5	10	July 11	Aug 17	Sept 6	T H Dixon	238 Montgomery st
Argenta M Co	Nevada	8	10	July 7	Aug 11	Sept 2	E M Hall	327 Pine st
Bullion M Co	Nevada	20	50	July 21	Aug 25	Sept 15	J M Brazell	328 Montgomery st
Belmont M Co	Nevada	23	15	July 27	Aug 30	Sept 26	J W Pew	310 Pine st
Best & Belcher M Co	Nevada	21	50	July 12	Aug 16	Sept 7	W Willis	309 Montgomery st
Caledonia M Co	Nevada	35	25	July 7	Aug 11	Aug 31	R Wegener	414 California st
California M Co	Washoe	1	30	June 30	Aug 5	Aug 25	C P Gordon	309 Montgomery st
Con Pacific M Co	California	3	40	July 9	Aug 1	Sept 1	F E Luty	330 Pine st
Grand Prize M Co	Nevada	6	25	July 30	Sept 8	Sept 29	E M Hall	327 Pine st
Gould & Curry S M Co	Nevada	43	50	July 15	Aug 19	Sept 8	H K Durbrow	309 Montgomery st
Gila S M Co	Nevada	8	25	July 22	Aug 22	Sept 6	J T McGeoghegan	316 Pine st
Hale & Norcross S M Co	Nevada	70	50	July 12	Aug 16	Sept 7	J F Lightner	309 Montgomery st
Leeds M Co	Utah	5	25	June 17	July 28	Aug 22	D B Chisholm	327 Pine st
Meadow Valley M Co	Nevada	16	30	Aug 1	Sept 10	Oct 4	H DeLaguna	414 California st
Mexican G & S M Co	Nevada	16	1 00	June 26	Aug 2	Aug 22	C L McCoy	309 Montgomery st
Maybelle Con M Co	California	8	20	June 22	July 29	Aug 22	W J Taylor	310 Pine st
Martin White M Co	Nevada	10	25	June 18	July 30	Aug 25	H L Scoville	309 Montgomery st
Mariposa L & M Co	California	21	1 00	June 8	Aug 10	Sept 7	L Leavitt	309 Montgomery st
Northern King M Co	Arizona	6	25	July 8	Aug 13	Sept 5	E A Holmes	318 Pine st
Oneida M Co	California	15	3 00	July 21	Aug 29	Sept 20	H P Bush	431 California st
Overman M Co	Nevada	50	50	July 20	Aug 24	Sept 14	G T Edwards	414 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Alta S M Co	Nevada	21	50	Aug 2	Sept 6	Sept 25	W H Watson	302 Montgomery st
Andes M Co	Nevada	17	50	Aug 8	Sept 14	Oct 4	B Burris	303 Montgomery st
Black Hawk M Co	California	17	10	July 15	Aug 19	Sept 8	H A Charles	419 California st
Belmont M Co	California	2	03	Aug 13	Sept 15	Oct 7	J Morian	328 Montgomery st
East Noonday M Co	California	2	05	Aug 2	Sept 8	Sept 24	C V Hubbard	310 Pine st
Iowa M Co	Nevada	14	05	July 27	Sept 12	Oct 5	O S Leavitt	411½ California st
Lodi M Co	Nevada	3	05	July 19	Aug 22	Sept 12	A B Paul	328 Montgomery st
Lodi M Co	California	3	05	July 19	Aug 22	Sept 12	A B Paul	328 Montgomery st
McMillan M Co	Arizona	3	20	Jan 12	Aug 26	Sept 26	J Morizo	328 Montgomery st
Mono M Co	California	13	50	Aug 6	Sept 12	Oct 3	W H Lent	309 Montgomery st
Mt Potosi M Co	Nevada	7	15	Aug 12	Sept 17	Oct 10	J H Sayre	330 Pine st
May Flower G M Co	California	12	10	July 19	Aug 23	Sept 13	J Morizo	328 Montgomery st
Morgan M Co	California	7	50	July 6	Aug 16	Sept 13	J Raphael	533 Kearny st
Mount Potosi M Co	Nevada	—	10	June 9	July 29	Aug 22	J H Sayre	330 Pine st
New York M Co	Nevada	26	10	July 15	Aug 18	Sept 8	D L Thomas	327 Pine st
Noonday M Co	California	3	50	June 28	Aug 3	Aug 26	Wm J Traylor	310 Pine st
North Noonday M Co	California	3	50	June 28	Aug 5	Aug 29	Wm J Traylor	310 Pine st
North Could & Curry M Co	Nevada	1	25	July 15	Aug 15	Sept 6	N C Southard	331 Montgomery st
Oakland M Co	California	15	05	July 30	Aug 31	Sept 19	R D Hopkins	436 Montgomery st
Sherwood M Co	Nevada	3	05	Aug 13	Sept 19	Sept 10	J M Buffington	309 California st
Silver Hill M Co	Nevada	10	25	Aug 16	Sept 19	Sept 10	W E Dean	309 Montgomery st
Sierra M Co	Nevada	59	1 00	July 15	Aug 18	Sept 6	E L Parker	309 Montgomery st
Steep Hollow G M Co	California	6	1 50	June 21	July 26	Aug 18	J W Pew	310 Pine st
Spaulding G & S M Co	California	2	10	June 28	Aug 23	Sept 15	J W Pew	310 Pine st
Tioga Con M Co	California	14	20	Aug 16	Sept 22	Oct 12	W H Lent	309 Montgomery st
Union Con M Co	Nevada	17	1 00	July 1	Aug 4	Aug 24	J M Buffington	309 California st
Union Con M Co	Nevada	17	1 00	July 1	Aug 4	Aug 24	J M Buffington	309 California st
Union Gravel M Co	California	17	50	June 28	Aug 4	Aug 25	H Fichoir	320 Sansome st
Utah S M Co	Nevada	35	2 00	June 23	Aug 5	Aug 23	G C Pratt	309 Montgomery st
University G M Co	California	9	10	Aug 15	Sept 20	Oct 12	Wm. L Oliver	328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Arnold G & S M Co	—	A Judson	320 Sansome st	Annual	Sept 5
Defiance G M Co	California	W H Lent	309 Montgomery st	Annual	Aug 24
Home G M Co	—	R Ellon	310 Pine st	Annual	Sept 1
Noonday M Co	California	W J Taylor	310 Pine st	Annual	Aug 31
Old Judge M Co	—	J E Hill	230 Montgomery st	Stockholders	Aug 30
Swamp Angel G M Co	California	Lewis Lillie	607 Washington st	Stockholders	Sept 15
Villagrana M Co	—	A Judson	320 Sansome st	Annual	Sept 5

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Aug 15
Father De Smet M Co	Dakota	H Dean	New York	50	June 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Aug 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Aug 15
Silver King Co	Arizona	J Nash	315 California st	25	Aug 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Aug 12
Western M Co	California	C S Curtis	309 Montgomery st	75	May 12

The Mining Share Market.

Mining stocks have been comparatively lively during the week, though nothing startling has occurred on the Comstock. The Virginia *Chronicle*, commenting on the statement that the value of Comstock shares has shrunk in six years $264,402,704, says:

There are many who will take a pessimistic view of the above startling summary and endeavor to wrest the figures into condemnation of mining and pursuit of wealth as stamped in evanescent colors on the certificates of stock values, which have exhibited such remarkable powers of expansion and equally vigorous force of contraction. Such a view may be a grateful one to some, and may open a vast chilling perspective dear to the cantions Bostonian or frigid speculator of the Quaker City, but to the average Utopian of this immediate section it will have none but a revivifying effect. Hope springs eternal in the Comstock breast, and the shrinkage in stocks of some $264,000,000 impresses the hopeful denizen of Mt. Davidson merely as an immense vacuum in values which may yet be filled up by active inflation of the very stocks which have so seriously collapsed. And there is this consoling thought, that if in the near future prices do not reach such extravagant figures as in the past, they are at least likely to have more lasting values, based on the solid backing of ore, which promises soon to be shown up.

There are once more rumors of a change in the control of Sutro tunnel. The Virginia *Enterprise* says: There was yesterday a rumor (and pretty well founded) that Mr. Mackay has either secured control of the Sutro tunnel or made arrangement by which he and some of the large holders will work harmoniously together.

Sutro tunnel stock is gaining strength in New York. The company will at no distant day commence work on some of the veins through which they have passed. With very little trouble they will he able to find a vast deal of excellent ore.

PARK CITY, Utah, is probably the most active mining camp between Tombstone and Leadville. In the past year it has nearly doubled in size and population and still continues to grow. The Ontario is pouring forth a steady stream of bullion. There are other mines in the place which many regard as fully as promising as the Ontario. The Ontario has produced $8,750,000. The hills surrounding the place may he said to he merely scratched for mineral.

New Dry Ore Washer.

A machine called the "Enreka Concentrator and Disintegrator" for dry placers, sand and cement, ie to he seen in the upper story of No. 10 Stevenson St., where we examined it this week. This ie the latest and most simple of the many "dry washere," end ie the result of a nnmher of years experience with this class of machines. It weighe about 250 pounds, and ie 3x4x4 in size.

The ore table is stationary, not having any side or end shake of any kind. Under it, however, is a peculiar douhle acting hellows which forces a pulsating hlast of air up through the drilling or light canvas, which, on top of a wire frame, forms the ore table. Riffles are formed on this inclined table to catch the heavier particles. A peculiar and valuahle feature of the appliance is an apparatus which keeps the coarser gravel, etc., moving on downwarde to the discharge end.

In most concentrators of this kind large pieces of gravel, etc., accnmulate at the riffles and do not allow the fine particles to he hlown or shaken off, thus clogging the riffles. In this machine, however, the coarser gravel is moved onward hy mechanical means eo it cannot pack. The mechines are warranted to stand the dry hot winds of Arizona and New Mexico. There is no leather or boards used in the construction of the concentrator. By a simple addition, a feed and tailing elevator is attached hy which the hopper is fed with the sand or gravel and the tailiogs are removed out of the way. With these attached a hurro or horse runs the machine. Light machines are made for a man to run hy hand. The makers of this apparatus have seen the defects of the dry ore concentrators and have endeavored to remedy them. It works very rapidly, and the one we saw had a capacity, we are told, of three tons per hour. Ordinary placer gold, shot, etc., was readily caught in its riffles. The concentrator is quite simple in construction, not liable to get out of order, and appeare to he well adapted for its work. More or less hlast can he given to work heavier or lighter etuffs. A hard graphite luhricator is used on the journals, and is applied in a peculiar way. This ie of advantage in hot climates like Arizona, New Mexico, or Mexico, where ordinary luhricators do not answer. There ere in these conntries thousands of acres of ground which cannot he worked except with machines of this kind, hut which can he made avaiahle when worked dry.

THE Chrysolite M. Co. paid a dividend of $100,000 in New York on the 10th. This is a Leadville property.

MINING SUMMARY.

The following is mostly condensed from journals puhlished in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

MORNING STAR.—*Monitor-Argus*, Aug. 16: Two more men were added to the force already at work on the Morning Star tunnel, this morning. They are laying track, retimhering and cleaning out the debris that has accumulated since the former owners shut down work, a number of years ago. They expect to have the tunnel in condition to commence taking out ore hy the first of next week.

THE work on the Illinois-California has been commenced hy the contractor, John Ellis.

IT is reported that Lewis Chalmers is having the machinery in the Exchequer mill overhauled, and expects to commence crushing in ahout 3 weeks.

THE owners of the Triumph are still working on their claim. They must have found the real color, we judge, from the active interest they are displaying.

AMADOR.

SPRING HILL.—Amador *Sentinel*, Aug 10: The shaft of the Spring Hill mine, near here, is down 300 ft. Encouraging rock is found, but it is intended to thoroughly develop it, and the sinking will he prosecuted to a further depth of 200 ft.

EMPIRE.—The water supply having slacked up, steam is being used at the Empire mill. Everything is moving along as though a $250,000 law suit was not pending. There is talk that the Merchant's hank has offered to scil its interest in the Empire to the Pacific Co., or they will buy the Pacific. Separate managements, as at present, will he of the most henefit to Plymouth. Drifting from the north shaft, toward the Alpine line, has been going on for ahout 3 weeks. It is intended to prospect clear to the Alpine line, a distance of 500 ft, unless a pay chimney is sooner struck.

BUTTE.

TREASURE BOX MINE.—Oroville *Mercury*, Aug. 13: But few of our citizens have any idea of the extensive mining operations that are being carried on near Thompson's flat. Tuesday, in company with the superintendent, Mr. Harris, we paid a visit to the works. Although the work has been in progress but a short time, still they have erected a hlacksmith shop and have two or three small buildings in the course of construction. The mouth of the tunnel is situated just ahove what is known as Black flat, about half a mile from Thompsou's flat, at the hase of Table mountain, and is reached hy a road which the company has just built. The tunnel is 6x6 ft in the clear and is timhered and lagged. The main tunnel is now in about 200 ft and is being run due north. There are 2 shafts being sunk on the line of the proposed tunnel which are down to the level of the main tunnel, and in the first they have run off on the line 70 ft, and in the second 16 ft. These shafts are 450 ft apart, and between these and the mouth of the tunnel 3 air shafts have been sunk. Mr. Harris states that he will not strike hedrock until he comes to the old Wardwell shaft, which lies in a direct line of the tunnel, and just above which they propose sinking another shaft. Early residents here will remember that the Wardwell shaft went down to hedrock and paid very rich indeed. The proposition is to drive the tunnel dus north 1,500 ft, which will hring it just under the lava caps, and then to swing it sufficiently to the west to strike the northwest corner of the company's claims. The swing of the tunnel will just clear the series of claims owned in Morris ravine. They estimate that the entire length will he one mile, and the object is to cut the old dead channel that lies under the lava caps of South Table mountain.

CALAVERAS.

BIG CLEAN-UP.—Calaveras *Chronicle*, Aug. 13: The Mammoth hydraulic, on Tunnel ridge, owned by J. F. Velth, Esq., has just finished cleaning up, after a run of 4 months. We have not heen informed as to the exact yield, hut hear that it is well up in the thousands. The Mammoth is one of the hest hydraulic claims in this portion of the county, and its proprietor is an experienced miner and knows how to work it to make it pay.

SOUTHERN ITEMS.—*Mountain Echo*, Aug. 6: A $10 nugget was picked up on Six Mile creek recently. The hoisting works on the McElroy mine are completed, and work is progressing as rapidly as circumstances will permit. Bennett & Co. are still engaged in sinking on the Raspberry mine. This mine in former times was very rich. We learn that Mr. Wm. Bovee, of San Francisco, has commenced operations on his mine and intends sinking a deep shaft. We visited the Dolan & Coggswell mine the other day and found it the most wonderful mine we have ever seen. It can hardly he called a quartz mine. It is simply a mountain of talc and quartz mixed, which yields from $5 to $8 per ton. There is no such thing as refuse in this mine; everything is worked from the surface down for a depth of 80 or 90 ft, and the hill for over 100 ft. It needs to be seen to he appreciated.

EL DORADO.

CRIZZLY FLAT.—Cor. *Mountain Democrat*, Aug. 13: Another set-hack has been caused hy the shutting down of the Mount Pleasant mine. We always write to speak of the Mount Pleasant mine as being the foremost and hest, hut forget to mention that it is the only one that has been prospected to any great extent. The Mount Pleasant shaft is now only 400 ft deep, hut, from present appearances, the company are going to work in earnest. Supt. Bradley, of the Crystal mine, was in town yesterday, and reports that the shaft siuking in that mine is still going on. Nearly every week we are visited hy men wanting to bond mines. We prefer capitalists. These middlemon are not doing us any good. They want to make it all, hut say that our prospectors are not willing to take reasonable prices. The Meltons are moving their mill nearer the river, which will give them an abundance of water-power. They will he kept husy crushing ore from the surrounding mines. Bullard, Drieshach and others are using the pick and shovel to good advantage. They are getting flattering prospects. They are go-ahead fellows and have great faith in our mines.

INYO.

GENERAL ACTIVITY.—Inyo *Independent*, Aug. 13: We are certain that there are at present more properties being worked in the county than at any time for a number of years. There has been during the year a very large aggregate yield of precious metals, the exact figures of which cannot and never will he ohtained. The individual owners and the companies operating hereabouts are averse to reporting the hullion yield. The immense product of hase hullion at Cerro Cordo, Darwin and Lookout can only he approximated, should any future statistician ever attempt to dig up the hottom facts.

BISHOP CREEK.—The interest of course centers around the great Polita mine. About 30 men are employed, under the general superintendency of George Story. We hear that the force has been decreased in the main 100-ft incline on account of had air, and a new perpendicular shaft started about 120 ft northward, for further development and for ventilation purposes through a connecting drift. The company is bringing in water by pipes from the head of Redding's canyon, a distance of about 2½ miles. There is a cluster of claims located all about it in every direction, including the Nugget and and La Ninya, east and west extensions, and many others. The Red Cloud, adjoining La Ninya, under bond to Russell & Loose, is working a small force, and at 30 ft in depth has the same ledge of rich gold ore as the more noted mines. In Redding's canyon several new mines are being opened by Calvin, Giles, Thompson and others, all looking well.

DEEP SPRINGS.—Across the Range, nearly east from this district, lies Deep Springs, where some 20 men are at work upon different claims, the most prominent being the California (old "Hard Cash"), Elio, Piouecr, Half Dol-

lar, Trade Dollar, Eighty-One and others on the west side of the valley, and the Zulu, Scout, Greenly, Cairo, Lake, Fortuna and others on the east. Messrs. Griswold & Todd, we understand, have purchased a mill and will put it in operation in the valley. Something of a detailed description of these mines will be given soon.

BEVERIDGE GOLD.—The Taylor 5-stamp mill, running on Keynot ore, cleaned up the proceeds of 180 tons on the 10th inst. There were 1,355⅞ ozs, worth $16.18 per ounce, amounting to $20,600. An increased force is to be put on the mill and the battery run day and night. All the parties interested state that the next month's yield will not fall short of $35,000. The old Kearsarge is beginning to promise well. With a small force at work, Supt. Grey is steadily opening a ledge of ore assaying from $200 to $1,200 per ton in silver. In the same district, it is rumored, work is to be resumed on the deep Independence tunnel, to tap the rich Rex Montis series at a great depth.

MARIPOSA.

A PROSPECT CRUSH.—Mariposa *Gazette*, Aug. 13: Mr. Mast, owner of several good mines on the other side of the river in the vicinity of Coulterville, has taken out 50 tons of rock from the mine near Tim Sheehan's, and is hauling it over to the Martin & Walling mill to have a prospect crush made.

PROSPECTS OF A SALE.—Mr. A. G. Black, of Bull creek, is taking the water out of the compromise and Marble Spring mines. We learn he is expecting capitalists from below to make a purchase.

RECENT OPERATIONS.—The Yosemite, or No. 9 mine, near Hornitos, is now running 25 stamps on excellent rock, under the supervision of the experienced miner, Mr. J. F. Thorn, with every indication of big returns. They will shortly run 5 more stamps, making 30 in all.

BIG STRIKE.—We are informed that a very rich strike has been made in the silver mines near this place. This company drive their works steadily ahead, making no blow whatever, and it is the hardest thing imaginable to find out anything in regard to their workings. We hope the reported rich strike is so, and we have every reason to believe it is by the way their business is conducted.

MONO.

BODIE.—*Free Press*, Aug. 16: The fact that the water has been so far conquered in Bodie district that levels are being run in the 4 deep shafts 200 or 300 ft under the old water line is a most gratifying circumstance. It would seem that we are very shortly to get a glimpse of the riches which have heretofore been guarded by what has been an impassable barrier, but which now has given way to the indomiteble pluck of the leading spirits of the district. The Lent shaft has reached a depth of 700 ft, and within a very few days a drift will be running for the famous Fortuna ledge, which will thus be developed at a vertical depth of considerable more than 100 ft below the lowest point worked, and on the slip of the vein perhaps 200 or 300 ft deeper. The Fortuna is a vein which the best judges of mines who have ever examined this district do not think will ever "quit." It is wider and stronger at its deepest development than anywhere else. Its discovery on the new level in good shape will give an immense "back" of ore, in addition to that now depended upon in the upper levels. This is one of the interesting points in the mining situation here just now. The Red Cloud is another. There a crosscut is already in 07 ft west from the shaft on the 600 level, running for the Concordia ledge. This ledge is the vein made of the Silver hill series. Its resemblance in many respects is most remarkable to the great Comstock lode. In size it is immense, its width being from 50 to 200 ft, and this great vein is the puddling in which our bonanza plums must be found. Successive rich ore chimneys have been found along its course, in the Concordia, Oro, Addenda and Dudley mines, through all of which it undoubtedly passes. The best developed chimney has been found in the Oro mine, over 200 ft in vertical deptb, commencing at a depth of about 300 ft, and continuing down to the 250 level, below which a winze is now being sunk. We believe these chimneys will make into bonanzas below, crowding out the clay and filling the vein to great width with rich bodies of silver ore. The water difficulty has heretofore caused out many of the weaker companies with good prospects, which it may be anticipated will resume work at an early day. Among the companies which have never ceased work at any time may be mentioned the Blackhawk, South Bulwer, Con. Pacific, Boston Con., Tioga and others which have been named. The foundation of the new Bodie Tunnel mill is complete, and the advent of the contractors is awaited.

NEVADA.

EMPIRE MINE.—Grass Valley *Union*, Aug. 13: This old mine, which has been one of the chief gold producers of the Grass Valley district for 25 years, during which time it gave an output that footed up many millions, but which during last year took a season of rest, is again in complete order, and being extensively worked. Since the pumping out of the mine, the main incline has been put in thorough repair, heavier pumps put in, and improvements made to boilers and machinery, which has reduced the consumption of fuel nearly one-half. Old drifts have been cleaned out and re-timbered, drifts extended and stopes opened to admit of extracting regular supplies of ore for the mill. Since pumping out the shaft it has been sunk from the No. 12 to the No. 13 level, which latter has been driven 50 ft south. Ore is now being extracted from the Nos. 4, 6, 9 and 13 levels, all of fair quality, and from No. 4, rock is being produced that will yield $50 per ton. Above No. 13 level there are 100 ft of solid backe, a strong vein, from 2 to 2½ ft thick, of fair grade ore, but better ore will be found as the drift is extended south into the old Rush & Leyton ground, as two distinct chutes put down from the upper levels into that part of the mine. Everything is looking encouragingly in the Empire, and it is believed that the old mine has years of valuable life in it yet. At the present time there are nearly 100 men at work in the mine, by the day, tribute and on contract, and this number will be increased as the drifts are extended and the stopes opened. Capt. John White is the general superintendent of the mine, and Charles Stokes underground foreman.

PEASONY MINE.—Grass Valley *Union*, Aug. 1: Work was interrupted in this mine the latter part of last week, owing to the break in the V flume, which cut off the water power to run the pumping and hoisting works, causing the water to rise in the shaft, and stopping the sinking for several days. The work is again going ahead, and it is expected that the depth of the shaft will reach 200 ft in the next 3 weeks. Upon attaining that depth, the contract made by the Oakland company with the owners of the Peabody location will have been fulfilled, and the further operations of driving drifts will be done under the auspices of the joint ownership, which will be an incorporated company. The preliminary steps for incorporation were taken on Monday, the number of shares being fixed at 60,000, of a par value of $5 per share. It is in contemplation to put up steam-hoisting works, and dispense with the use of water, as there is too great a liability to interruptions to a constant supply.

PLACER.

FOREST HILL NOTE.—Placer *Times*, Aug. 13: The Hidden Treasure mine company has lain a new track through the entire length of the tunnel in their mine, and are now ready to resume work in their mine. Rumor says Breece & Wheeler, at Bath, have struck very rich pay in their mine. The Dardanelles Co. are putting a number of men to work in their mine, good pay dirt having recently been struck.

RICH ROCK.—*Herald*, Aug. 13: We were shown a piece of rock a few days ago from the Tremilling Bros.'e mine, on Bellvue hill, that was rich enough for specimens. Many very rich crushings have been taken out of this mine, and its richness seems to increase. The specimen referred to was taken from the drift at the bottom of the shaft, 160 ft from the surface. We understand from Ned Tremilling, who showed us the specimen, that the ore in the lower level is all remarkably fine, and that while the mine has paid them well from the start, their prospects were never so flattering as at present.

PLUMAS.

MINING.—Greenville *Bulletin*, Aug. 13: The Indian Valley drives steadily along. There is nothing new to report. Under the present management the mine is like any other settled industry in one of the older States. The same is true of Green Mountain, Gold Stripe and other mines in the vicinity. Where enough capital is invested to provide suitable machinery and the same is placed under skillful operators, good returns are regularly obtained.

CHLORINATION WORKS.—A great deal of the ores here contain sulphurets. The only reduction works near us are at Sutter creek, but the steepness of the road puts them out of the field for Greenville. An establishment of the kind is much needed here. A custom mill could be run in connection with it.

JAMISON NOTES.—Cor. Plumas *National*, Aug. 13: The richest mining strike in the southern part of Plumas since the discovery of the Eureka and 70 mines, was made a week or two ago by Felix O'Neil and Wm. Roach, who associated with themselves Wm. Roberts. The strike is on the spur of the mountain that divides Squirrel creek from Poplar creek, almost on the summit of the mountain. The lode runs north and south, dipping east, and is from 2 to 2½ ft thick; one wall porphyry, the other chlorite slate, and only opened in two places, about 100 ft apart, shows by the surface indications to be continuous for several thousand ft. The mountain side, which is very steep, is strewn with quartz, most of which is covered with little specks of gold, plainly visible, making it a wonder that it has remained undiscovered so long. One of these bowlders was found by John Nichols some years ago, and he and Squire Lannes prospected for 2 years to find where it came from, but without success. O'Neil & Co. will start a tunnel on the east or Squirrel creek side of the mountain to-morrow morning. This will tap the lode not very far from the crest, and as the dip is toward them they will not have far to run. The ground is favorably situated for draining 600 or 800 ft in depth. As is usual in such cases, the country has been all claimed, and notices posted for a long distance on the course of the vein—John W. Hill, John Swan and Alloth getting in on the first extension north, and they are now running a tunnel. Paul Serrand and others have the first southerly extension. In proof of the old adage that "misfortunes never come singly," while Hill was up making the location, Alloth, while walking up a water way that run through an old dump in their claim, picked up a chunk of quartz, about a pound and a half in weight, that contained over $100 worth of gold, which had evidently passed through the sluice while piping on the mountain side a couple of years ago.

SIERRA.

QUARTZ AND GRAVEL.—*Mountain Messenger*, Aug. 13: This week G. F. Orr, superintendent of the Big Emma mine, Rasp's ravine, Kanaka creek, 6 miles southeast of Forest City, called on us, and reported that while prospecting for quartz, gravel was struck. A shaft has been sunk 9 ft to the bedrock, and river-wash gravel found that paid 15 cts to the pan. Fifty thousand dollars have been put up for developing this ground. The quartz ledge was discovered with a diving rod. A flume 800 ft long and a large derrick are to be constructed. Drs. Martin & Draper, of Oakland, are owners.

SIERRA CITY.—Haskel Peak has sunk 50 ft at the end of the tunnel, finding prospect of quartz gravel with fine gold. Ten hundred and one are now running over their channel of blue quartz gravel, appearing better than ever before, the prospects well in fine gold. Blue Gravel is still running their tunnel through blue quartz gravel that has prospected well in fine gold—now in 450 ft. Eureka Con. has a large force at work, pushing their tunnel ahead rapidly as possible. Washington ere now making good progress with their tunnel in cement and gravel.

WATER.—The Extension company is preparing to pump water from the Phiocene shaft for use at their mine, Forest City. A flume over a mile long will be needed to drop the water into the South fork of Gregon creek. The water will be used to drive air into the mine and to wash gravel. The company now has about 800 carloads of gravel in the dump. It has also ordered 2,000 running ft of steel rails.

GOLD BLUFF mill has been running for some time, and the prospects are good. Parties will be up in the spring from Oakland to search for the extension of the Rainbow quartz ledge. They claim 6,500 ft of the lode. Work on the Good Hope quartz mill is progressing. Mr. Hewson, the owner, has not yet returned from below. Two cast-iron mortars, weighing 5,300 each, were shipped to the Sierra Buttes quartz mine this week by Forbes & Taylor, proprietors of the Downieville foundry.

CONTRACT.—The Ex. Co. has let a contract to M. Herp to cut 100 cords of wood at the Pliocene shaft at $3 per cord. Bald Mountain Co., Forest City, is working over 100 men, and this mine is now said to be again yielding handsome returns. Five carloads of gravel, shipped by the M. X. Co., Forest City, this week yielded $21. The water for washing was kindly given by the Bald Mountain Co.

RUBY.—The Ruby Co.'s tunnel is in about 2,000 ft, with moderately soft bedrock. The use of the Burleigh drill has been discontinued. It is the opinion of the owners that they are nearing or are undercutting a channel. Savage has raised up 20 ft, and gravel is expected 30 ft above. Tunnel is in 1,000 ft, and is 1,200 ft below top of ridge. The upraise is being pushed through granite mixed with slate, quartz and syenite.

SISKIYOU.

KLAMATH.—*Democratic Times*, Aug. 12: Mining the bed of the Klamath river in Siskiyou county is proving more remunerative than ever this season, and a large number of claims are being worked. One company, composed of 3 white men and 5 Kanakas (some of this latter former residents of this place), has struck it very rich, one panful of dirt from their mine paying $50 and a bucketful $500. They expect to take out $100,000 during the season.

TRINITY.

BUCKEYE COMPANY DOINGS.—Trinity *Journal*, Aug. 13: Mr. S. K. Holman, superintendent in charge, kindly furnishes us the following items touching the Buckeye ditch and the progress made in repairing last winter's damages: "The repairs decided upon last spring—that is, the opening up of the old ditch between Bolt's hill and Van Matre's creek, a distance of 22 miles—were completed July 31st. The necessary repairs and ditch cleaning proved more extensive than the March examinations indicate, but far below in cost as well as extent—this wild and extravagant reports current during last winter and the early spring. The work done covers putting in 200 12 ft boxes, 4 ft wide and 3 ft high, in strings of 2 to 35 boxes, distributed over 13 miles of ditch and representing about 40 breaks; cutting and putting up 124 sets of timbers, separate from the boxes and lagging and covering the same; running a tunnel 232 ft long, in rock 6 ft by 5 ft in the clear, and timbering and lagging the same top and sides; walling up sundry breaks at head of ravines, shoveling out slides, caves, etc, thoroughly cleaning the ditch for 14 miles and doing much other work which, though expensive, does not show on the surface. All has been done as rapidly as true economy dictated, with a moderate gang of men who have worked faithfully and efficiently under the able leadership of Mr. E. N. Sbedd.

NEVADA.

WASHOE DISTRICT.

OVERMAN.—*Enterprise*, Aug. 16: The drift on the 2275 level has been extended 45 ft without meeting with any material changes in formation.

CHOLLAR-NORCROSS-SAVAGE SHAFT.—The hydraulic pumps are running at 6½ strokes, handling all the water from the 2400 level.

CHOLLAR AND POTOSI.—We are cleaning out the joint drift on the 2400 level, preparatory to the resumption of prospecting.

CALEDONIA.—The pump has been run an average of 9 hours per day, consuming four and one-seventh cords of wood per day. The Forman shaft has been sunk and timbered 15 ft; total depth, 2,125 ft.

CON. IMPERIAL.—Have been engaged this past week in digging drain and putting in boxes to carry the water from our 2900 and 2100 levels to the Jacket pumps.

HALE & NORCROSS.—The 2400 winze is now 105 ft deep. We are cutting out a station at the 2500 level. Will resume sinking in a few days. The flow of hot water continues strong.

CON. VIRGINIA.—On the 2300 level the Joint Best & Belcher crosscut has been advanced 26 f On the 2500 level the joint California winze has been sunk and timbered 10 ft, and switch plates put down.

UTAH.—The west drift on the 400 level is now in a distance of 10 ft, with the face in a favorable looking formation.

CALIFORNIA.—During the week 61 tons and 400 lbs of ore have been extracted. On the 5200 level the joint Con. Virginia winze has been sunk and timbered 10 ft, and switch plates put down. Bullion shipped to the value of $3,491.65.

UNION CON.—The 2700 station at the bottom of the joint Sierra Nevada winze has been completed. The joint Mexican east winze on the 2500 level has been sunk and timbered 10 ft.

SIERRA NEVADA.—On the 2700 level joint Union Con. drill hole No. 2, from station, extended 65 ft, and drill hole No. 3 extended 75 ft. Taking out main pump and cleaning out shaft. Bullion shipped, $5,362 88.

CANDELARIA DISTRICT.

MOUNT DIABLO.—*True Fissure*, Aug. 3: Drifts are being run east and west from the north crosscut at the bottom of the main winze, called winze No. 1, from the 3d level. The west drift shows a 2-ft ledge of ore, assaying from $40 to $50 per ton. The east drift is showing a ledge of low-grade ore that looks promising. In the face of the west drift, on the 2d level, is a streak of ore assaying from $66 to $73, and the appearance is very encouraging. A drift is being run west from the main stope on the 1st level, and has a good vein of ore in the face. A shipment of bullion was made on the 5th instant, amounting to $11,-318.10.

NORTHERN BELLE.—The development in the 1st level, mentioned in the report of last week, looks fully as promising as it did then. The other shaft levels show no material change, and are yielding as usual. A large amount of work is being done on the adit and the levels above, and they look as well as a week ago. The 9th especially presents a fine appearance. Mill No. 1, which shut down on the 5th inst. to clean up the Mount Diablo crushing and to make some slight repairs, started up again on the 7th inst. Bullion shipments for the week ending August 10th were $19,978.32.

HOLMES.—The winze in the main tunnel has reached a depth of 30 ft, and good headway is being made, the ground being of easy breaking character. The north drift has advanced 12 ft. It has been very hard in the face, but is coming in softer. A tunnel has been started at a point down the hill 285 ft perpendicular from the old workings, from which some developments of an important character may be looked for in time.

GEN. JACKSON.—Work in the drift continues in good looking ground, and fair progress is being made. The ore still continues in strength in the drift, and is of better grade than that of last week. The Gen. Jackson certainly bids fair to become a mine of more than ordinery merit.

CHERRY CREEK DISTRICT.

THE TEACUP SETTLEMENT HANGS FIRE.—White Pine *News*, Aug. 5: Dispatches received here during the early part of the week were of such a favorable nature as to lead our people to believe that a speedy settlement of the affairs of the company was pretty certain. A dispatch received Thursday afternoon, however, dissipated all such hopes, and leads to the impression that the overtures made by Mr. Kobbe to the creditors when here were anything but made in good faith. This last dispatch says: "We have contracted to crush 1,000 tons Exchange ore. Will pay off labor bills. Will the creditors except company's notes, payable in three months, and guarantee not to disturb us." This is just what the creditors refused to do when Mr. Kobbe was here, and they have not changed their minds since then.

DUN GLEN DISTRICT.

BUILDING A MILL.—*Silver State*, Aug. 11: The Auburn Con. G. M. Co. of Dun Glen have decided to build a first-class 20-stamp mill in Badger canyon, on the east slope of the Range near their mines. The machinery has been ordered, and the Superintendent, L. S Hodges, invites proposals for hauling it to the mill-site and for erecting the mill.

ESMERALDA DISTRICT.

PROGRESS AND DOINGS.—*Herald*, Aug. 13: The mining news from all sections of the county is very flattering, and bears us out in the assertion that Esmeralda county will in a few years be sending out more bullion than any county on the Pacific coast. New discoveries are made almost every day, and the rock sent us shows rich in gold and silver. Wherever the ore is worked the result is always good, and in most cases the returns are exceedingly high, in some instances yielding thousands of dollars per ton. Mines in Esmeralda district are numerous that have fine prospects, and they can be purchased at reasonable figures. We learn that New York parties have become interested in two prominent properties in Aurora, and work will commence on one of them shortly.

THE CENTENNIAL.—The work for the week has been in the incline, which has been driven down about 6 ft, making its entire depth 236 ft.

SILVER LINING.—An incline is being sunk on the Silver Lining, and shows the ledge to be a continuation of the Humboldt West, which mine it joins on the north.

CORTEZ.—At the bottom of the incline the width of the ledge is now 6 ft, and the quality of the ore splendid, as formerly; and throughout the mine, wherever work has been or is being done, excellent paying ore is seen. We hope the Cortez mining company will soon commence the erection of a mill to work its own ores, as we need no assurance that it could keep a 20-stamp mill clattering away all the time on ore, the returns from which would astonish "the oldest settler."

EUREKA DISTRICT.

GEDDES & BERTRAND.—*Sentinel*, Aug. 14: Dick Berryman, foreman of the Geddes & Bertrand mining company at Secret canyon, has a number of men employed in tearing down the old smelting furnace to make room for the new 20-stamp mill that is to be erected immediately. All the material for the mill has been ordered in San Francisco, and the carpenters, millwrights, etc., will commence building operations in a day or two.

THE BANNER MINE.—The Banner mine is looking better than for a long time past. There are several thousand tons of ore in sight and of higher grade than has usually been obtained. Mr. McGarry will put on an increased force of men at once, and send down the ore in greatly increased quantities. He is satisfied that the Banner will give a better account of itself in the future than in the past.

THE ALPINE.—This is the name of a mine owned by Jobu Baker and Tommy Hailey. It is situated on the summit of Prospect mountain, between the Banner and Orange mines. A miner, doing the assessment work on the Alpine, has just developed a fine showing of high-grade carbonate ledge. The prospect is a most flattering one, and will doubtless be followed up until the extent of the body is determined.

ARIZONA.

SILVER DISTRICT.—Cor. *Journal*, Aug. 10: The result of development in this district of remarkable lodes continues very favorable. The many huge coutact ledges in north Silver district, of which there are at least 10 miles of massive croppings on the different channels, and now in a condition for inspection, as the Territorial road has been completed and wheeled vehicles can be driven to within a half mile of the outside claims.

THE Clip mine, which is showing up as one of the most remarkable claims in the district, in that the entire shaft averages an assay of 70 ounces silver to the ton, milling rock. Milton Santee is the owner.

THE first north extension is the Alberta mine, upon which but little work has been done. It shows a continuation of the same variety of ledge matter as on the Clip, and will soon be opened by the Chicago company.

THE Black Rock has a gang breasting off the massive croppings, and the result is highly satisfactory. The scarcely any is added to the waste dump, and the milling rock will average 50 ounces to the ton, and the lowest grade of furnace ore, carbonates and black galene, assay 170 silver to the ton; this, mind you, on the surface; and from the various shallow cuts now in on the ledge the surmise is favorable to 1,200 ft in length of just such a variety.

THE Silver Glance tunnel, now in 100 ft, has tapped the ledge, and struck it rich in a foot of high grade, black galena ore, which is increasing in width as the tunnel progresses; and, at the same time, on the same shift, a large body of high-grade carbonate ore was struck in the shaft on the same lode.

IDAHO.

WOOD RIVER SMELTERS.—*Times*, Aug. 10: Four smelting furnaces, having an aggregate daily capacity of 95 tons, are now on Wood River—one, of 5 tons capacity, is being erected at Bellevue, and will probably be heated up the middle of September. Another is going up about 4 miles beyond Galena. It is being erected for the Senate Co., and is of 30 tons daily capacity. The road from Galena to the site is nearly completed, and the furnace will probably be "blown in" about the 1st of October. The Philadelphia Co.'s sampling, smelting and separating works, at Ketchum, are being erected as rapidly as men and money can do it. The office and boarding-house are completed, and the road to the head of the West Fork is nearly finished. The works will have a daily capacity of 40 tons. The furnace will probably be ready in about 40 days. The Wood River Co.'s smelting works, near this city, are running right along, and turning out bullion by the carload. The fifth was shipped to-day. It went by way of Blackfoot, as no teams could be got to take it to Kelton.

MONTANA.

MOULTON.—Butte *Miner*, Aug. 9: A livelier impetus has been given to the operations of the Moulton mine within the past 10 days. Yesterday the main 3-compartment shaft of the mine had reached a depth of 450 ft—50 ft over half the distance for which sinking has been contracted for, which is 800 ft. It is a model shaft. No trouble is experienced from water, and the rock in the bottom throws out well.

ALICE.—The ore bodies in the 100, 200, 300, 400, 500, 600 and 700 levels are reported to be presenting their customary appearance. The product of the mine, which is not worked to its full producing capacity, may be placed at 75 tons per day on an average. The mine is so extensively opened that the present per diem ore product could readily be doubled without much extra exertion, if the ore was required for milling purposes. Both Alice mills are running smoothly, and the mine is paying monthly dividends that will aggregate for the year 1881 the handsome sum of $480,000.

LEXINGTON.—The Lexington main shaft is now down 195 ft, and is timbered 190 ft deep. The rock in the bottom is tight and the volume of water medium. The progress of the shaft downward has been something over 1 ft per day for the last week. Plenty of free-milling ore to supply the Davis 10-stamp mill is taken from the mine daily, and that is the present per diem ore product. The sale of the mine is looked upon as being as good as made.

BELLE OF BUTTE.—Work on the Belle of Butte mine actively continues. Driving the east level from the main shaft on the ore vein is developing a fine chute of rich ore. The vein is strong and measures nearly 15 ft wide where it has been crosscut. The ore coming from this level, which is to the east about 16 ft, is high grade, assaying 88 ounces in silver, and carrying gold. Free gold can be seen in some of the ore coming out. Crosscutting through the vein in the west level is going on. A short time ago the Silver Bow Co. purchased the Belle of Butte for $25,000. The company has already developed enough first-class ore to pay for the mine.

ACQUISITION.—The new main shaft on the Acquisition mine was down and timbered to a depth of 175 ft yesterday. Within the past week the shaft has been sunk about 10 ft. No indications of striking the ore vein are met in the shaft.

STEVENS.—On the Stevens mine work is now continued to sinking the main shaft. Sinking is accomplished slowly, as the rock is decidedly hard.

NEW MEXICO.

GEORGETOWN.—Cor. *Herald and Southwest*, Aug. 6: Georgetown has been a paying camp from its discovery down to the present time; but, since the purchase of some of our mines by the Mimbres M. Co., our camp has taken on a different appearance altogether. This company, having ample means, has introduced good and powerful machinery, both into their mills and mines. They are thus enabled to work and develop their property with much greater facility than heretofore, when elbow grease was all we had to depend upon. This company is now employing about 200 men at the mines, besides those employed at their mills. With teamsters, wood choppers, coal burners, etc., the force is probably 250 men in all. They are now extracting 15 tons of ore per day. They have recently purchased the Big Cedar, the Glanorgan and the Centennial mines, which will add considerably to their mining property in the camp, and, it is to be hoped, will also add considerably to the output of metal. Their mills are now turning out from $30,000 to $40,000 per month, and their business appears to be in every way in a thriving condition. There are some other mines in our camp not owned by the above-named company. To wit, the McGregor, the Commercial and the Satisfaction. The McGregor is now worked very profitably by the owners, Alex and Malcolm McGregor. They are taking out some of the finest ore that ever came from their unusually rich mine. This ore is not only rich, but is also very free, and is easily worked in the mill to over 90% of the assay. This is now, as it has always been, a paying mine, and we have often thought that we would not want a better thing than to own it and the Commercial, which is contiguous, and a good stamp mill. There is a chance for profitable investment here, as we are satisfied that the owners of these mines will sell at fair figures, notwithstanding they are paying them well under the difficulties above named. Messrs. Lucas & McKay have recently returned from the Cuchillo Negro county, east of the Mimbres mountains (Black range), where they have been looking after their mining interests. They report the mines in Apache district looking very well indeed. They have had assays from some of their mines situated near the South Fork of the Cuchillo Negro creek. Assay No. 1 shows $10.32, No. 2, $898.32 and No. 3, $426.15. These assays were made by Dr. E. Andrews, of Santa Fe, and prove the fact that they have some very high-grade ore, the samples all coming from near the surface.

OREGON.

CLEAN-UP.—*Democratic Times*, Aug 12: Jacob Wimer and his son, W. J. Wimer, of Waldo, were in town this week. They brought with them their share of the gold-dust that has been taken from Wimer & Simmons' claim, in Josephine county, which is enough to make anyone happy. Over $20,000 have been cleaned up thus far, and this season's work will not be completed for a few weeks yet. There are few better pieces of mining property then this. The owners are men of energy and enterprise, and deserve their success. S. Arnemith is engaged in wiggdimming Squaw creek. Several parties are prospecting for quartz on Wagner creek. Yaudes, Saltmarsh & Co., of Sterling, have finished cleaning up, with satisfactory results. S. C. Carter has struck a good pay streak on Squaw creek, from which he took $8 in two days recently. Kleinhammer, Towne & Reynolds, of Sterling, will finish cleaning up in about six weeks. Water is getting light there. Jos. Eppersou was in town last week attempting to organize a company for the purpose of mining some ground on Steamboat with a hydraulic. Wm. Heeley and J. M. Dews, miners from Big Applegate, were in town yesterday, having made a clean-up that proved satisfactory. They will soon commence putting the Squaw Lake Ditch Co.'s mining property in order..

The Youth of California.

Four Stockton boys are under arrest for manslaughter. It seems that they were entertaining themselves by propelling a hand car along a trestle which was only the width of the track, waiting their opportunity to catch a Chinaman crossing the trestle. When an unfortunate Celestial essayed to cross they would rush the car upon him. The successful manner in which they pursued their fiendish sport is described by a witness in the Police Court, as follows:

The boys saw the Chinaman crossing the bridge, and one of them cried: "There goes a Chinaman." They immediately pushed the car toward the deceased. The Chinaman fell on his knees and elbows on the bridge close to the track. The hind wheel of the car struck the deceased and knocked him off the bridge. He struck a timber in falling and it turned him over. He fell sideways into the water and was drowned. Ten minutes before that the same boys had chased four Chinamen with the same car. Three escaped by running ahead of the car and by getting on the opposite bank before the car overtook them. One was caught by the car and escaped by catching hold and getting upon it. When the boys started the car after the deceased they kept yelling: "There goes a Chinaman; start her up."

The Stockton *Herald* says: These boys, or all but one of them, are members of Sunday schools connected with evangelical churches in this city.

We would gladly escape the duty of comment upon these appalling facts. We learn of this outburst of the worst type of hoodlumism in the interior of the State with the most profound sorrow. We had no idea the evil was so wide-reaching. It may be clearly shown that these boys had no intent to endanger life or to destroy it. It may be that they thought, if they thought at all, that the Chinaman they killed would save himself as the others they had attacked escaped. And yet when one thinks of the state of mind in boys which would lead them to such sport, and of the deplorable results if a taste for such sport should become general among our youth, the occasion for remark upon the occurrence cannot be set aside. If such are the boys of California, what will be the coming men of California.

This is the question that every parent, every teacher and everyone who in any way exerts a molding influence upon the thoughts and conduct of our youth must squarely and resolutely face. If the facts described above do not enforce the lesson, it is hard to conceive any event capable of enforcing it. Here are four boys who have certainly been exposed to some good influences, indulging in a sport, in actions thoroughly had in conception and murderous in execution. Where rests the blame?

Perhaps a share of it may be charged to a class sentiment more or less prevalent, that a Chinaman is the ordained victim of any persecution. Let this brutal sentiment bear all the blame which can be placed upon it. It is a disgrace to manhood, a triumph of cowardice, an outrage to every sense of fairness. It is inhuman, base and altogether abominable. Would that all the blame could be placed upon it for it is bad enough to father any crime. But can we charge a more or less prevalent sentiment with the corruption of our youth and idly wring our hands in contemplation of impending evil?

A public sentiment is the product of individual minds. We are prone to lose sight of our responsibility when we think of its existence or its influence. And yet the responsibility remains, and it is well to face it. The depravity of these Stockton boys is directly chargeable to their parents, and is doubtless the result of their home training or the lack of it. The Chinaman in the case is but a small part of it. Even if these parents cherish strong feelings against the encroachment of Chinamen upon the labor fields of the State, this is no excuse for persecution or for the encouragement of cruel thoughts in their children. No child whose mind had been properly trained to thoughts of gentleness and nobility would treat a dog as these boys treated a human being. It is plain that youth who early find sport in the persecution of any of God's creatures, will later in life develop into heartless men, reckless of everything, unless the early propensity is rebuked and suppressed. For this reason it behooves every parent to guard well the children entrusted to his care. The future of the children themselves demands it. The future of the State is imperiled by the growth of a cruel, cowardly sentiment in its citizenship. The old age of the parent will be no peaceful period if he allow the seeds of discord to find rooting in his children's minds. All considerations call for the full and conscientious discharge of parental duties, and the event at Stockton should most forcibly impress this fact upon all minds.

The Stockton *Herald* states that at least three of the boys were Sunday school scholars. This is the greater shame. It does not argue against Sunday school training, although it should incite teachers to exercise greater skill and care in the inculcation of the spirit of nobility and gentleness which is embodied in the gospels which they expound. It shows that the Sunday school teacher must endeavor to gain a closer acquaintance with the thoughts and desires of the youth they gather around them, and aim to repress the thoughts which neglect at home give opportunity for growth. We trust the unfortunate occurrence at Stockton will open the eyes of all to the danger which threatens, and lead all to renewed and more earnest efforts to guard against it.

MUCH excitement exists in the northern portion of Napa county over recent extensive discoveries of chrome iron. Large numbers of people are continually out prospecting and locating claims wherever they find indications.

Cable Railroads.

The following paragraphs on the above subject are from the address of W. W. Morrow, at the opening of the Mechanics' Industrial fair:

In this city, under our very eyes, we have seen a revolution created in the system of street railroads, and, while to the public of San Francisco the transition has been gradual and familiar, the invention is of such a character as to deserve here special mention, because the inventor was for many years the President of this noble and enterprising society, and the invention itself is another example of what Californians are doing for the world.

For many years, horse flesh has been the principal motive power used in carrying people to and fro in cities and towns. And as the democratic omnibus succeeded the more aristocratic cab, it in time became supplanted by the less noisy, more convenient and less costly street car; but they all had to be drawn by horses, and as these modes of conveyance multiplied, as they naturally did from their convenient and cheap mode of transit, more horses were used, and a larger number killed by overwork, especially on streets where the ascent was steep, or where the number of passengers carried was very great.

Steam motors, compressed air, latent steam, and other plans had been tried without success, and methods that could be operated on country roads were not permitted to be used in cities and towns.

Large corporations were formed for carrying on street railroad traffic, and possessing thousands of horses, immense stables for their care and maintenance were required.

In such cities as Philadelphia, where streets are almost level and laid out at right angles, the city railroad companies have a car line on every street, and make large profits on their passengers at the rate of fare charged.

But in many cities, like San Francisco, where the streets run up and over steep hills, the service to the public was poor, the remuneration to the company was not great, while the comfort and care of the poor horses was certainly as bad as it could be.

The highest hills in the city were uninviting, except to the enthusiastic climber who had just arrived and wanted to get a bird's-eye view of the State.

At the north end of the city the cars of the Omnibus Railroad Co. were drawn up Jackson street from Kearny to Stockton, a distance of 875 ft., by 5 horses, the elevation in that distance being 73 ft.

In the winter evenings, when the cars were crowded, the struggle of those unfortunate horses up that steep hill was something terrible.

It was on such an occasion in the winter of 1869 that A. S. Hallidie was watching the efforts of the horses to draw up an overcrowded car, when one of the animals slipped on the wet cobbles and fell, throwing down the horse behind him. The brakes were immediately put on and the horses urged to regain their footing; but the brakes being insufficient to hold the car on the steep incline, it slid backward, dragging the horses down the hill to the crossing below.

To this incident we are indebted for the cable road of to-day, and all its attendant comforts.

Within two years Mr. Hallidie had matured his plans for a road, but, like all such inventions and enterprises, it did not at first meet with much encouragement, and but for the assistance and co-operation of two or three gentlemen, who saw in it more than the mere fancy of an inventive mind, it would have slumbered where it was born.

In September, 1873, the first railroad of the kind ever built was constructed on Clay street in this city, and, while a great many difficulties and obstacles had been overcome, and notwithstanding it surprised the majority of the people by the simplicity of its working, it yet failed for some time to convince the skeptical of its ultimate success, but as it continued to run month after month under the care and guidance of its master, it gradually won the confidence and admiration of the entire public.

The simple principles involved and their ingenious adaptation mark the value of the invention and the success of the undertaking.

And what a revolution it has made in the mode of transporting passengers in this city!

The hills have fallen down before it, and they are now even more accessible and certainly far more desirable for residence than the level portions of the city.

Where the goats used to frolic on California street hill mighty railroad kings have built their palaces. The bald old hill has taken on all the bewitching charms of a young girl with a bright, new poke bonnet, while Clay street and Russian hills, decked out in their new finery, flirt with those brown old hills across the Gate in Marin county.

The summit of Clay street hill, reached by the cable road, is 307 ft. above the starting point at Kearny street, and the time required to make the transit is six minutes by cars that depart every five minutes, ascending the steep incline as noiselessly and as lightly as a bird in flight. The feelings of personal discomfort for the tired and straining horses are entirely absent, and the weary passenger returning home, enjoys a rest of body and soul.

Property on these hills which, before the advent of these roads, could be purchased for almost any price, now commands high figures and is being rapidly built upon and improved.

It is eight years ago yesterday since the first experimental trip was made on the Clay street road, which at that time was 2,880 ft. long.

Since then the road has been extended to double that length. Four other roads have been built, and another is now in course of construction. On the five roads now in operation steam machinery is employed of the aggregate of 1,300 horse-power, keeping in motion for 18 hours each day 17 miles of steel wire rope, containing 2,350 miles of wire and transporting 40,000 passengers daily.

Under the old system one horse would draw, on a nearly level road, an average of 40 passengers daily; but 10,000 horses could not perform the work of our present cable roads. Another item is the expense. On the Clay street cable road 36 lbs. of coal will draw 40 passengers; or in other words 9-10 of a pound of coal, costing 3-10 of one cent, represents the cost of fuel in drawing one passenger.

While the underground railroad is the peculiar feature of London, and the elevated railroad is in like manner the feature of New York, San Francisco takes special pride in her cable roads, in which there has already been invested a capital of one and one-fourth millions of dollars.

The enterprising city of Chicago, that never does things by halves, is building a series of cable roads which will cost over $2,000,000.

Thus it will appear that while the design of the inventor was more particularly to overcome the difficulties of steep grades, it will prove there, as it has here, admirably adapted to level streets, and the result will probably be that the principal cities of the Union will be compelled to adopt the system on account of its economy, noiselessness, rapidity and general comfort.

I might go on and multiply illustrations of the inventive genius of our people, but time does not permit of extending the inquiry on this occasion. Let me, however, recommend you to visit the Mechanics' pavilion, and there, among the thousands of articles exhibited, showing the latest productions of the farm, the machine shop, the factory and studio, you will find improvements and inventions both novel and curious, to excite your study and admiration.

Sulphuric Acid as a Metal Separator.

The parting process which the Lyon Mill and Mining Co. is about to put in practice is based on the principle that heated sulphuric acid 62 strong will dissolve the silver and copper from an alloy of gold containing not more than 10% of metals other than silver.

The details of the process are as follows: In the separating room a mass of 200 lbs. of alloy is placed in a large iron kettle with 150 lbs. of acid, and boiled. During the boiling process, which lasts about five hours, 200 lbs. more of acid are gradually added, and the resulting solution is run by a siphon to the lead precipitating vat on a lower floor, where the silver, as fine silver, is thrown down on copper slabs, by the greater affinity which sulphuric acid has for copper, which causes it to unite with and form sulphate of copper, leaving the silver practically pure.

The gold remaining undissolved in the kettle at this stage of the progress, is entirely lacking in the metallic luster which gives it its principal value as an ornament, and resembles a muddy sediment. If desired, it could be brightened even in its finely subdivided condition by the repeated baths in hot acids and water; but this is not necessary, as it regains its metallic luster upon being melted. It is taken from the boiling kettle, filtered and washed to remove the acid, and cast into bars.

The fine silver in the precipitating vats is washed off the copper slabs, and treated in a similar manner. The copper solution is carried to the crystalizing vats, where it forms into the blue crystals known as blue stone. In connection with this process there is an intricate system of lead pipes and reservoirs, planned by Mr. Gignoux, the chemist, for the saving of acid and metallic particles carried off mechanically.—*Lyon County Times.*

Success of the Stombs Elevator.

The Yreka Creek Mining Co. have been bothered a good deal in getting the new Stombs elevator to work successfully, but have received some new castings to obviate the difficulties, so that they will soon be able to start up the new machine, and stop work on the Cranston elevator in the old pit below, for which sufficient water cannot be obtained to work every day. The trouble with the Stombs elevator is to get air in the mouth to make suction, when a flood of water comes. The machine works splendidly until the water gets above a certain hight, and throws water and gravel 35 to 40 ft. high with the greatest ease. The new castings received from below are attachments to furnish the air required in the mouth of the elevator where the hydraulic nozzle enters, which it is thought may prove successful. The Stombs machine will do about half the work of the Cranston elevator, but will only need half the water, so that with 500 inches it can be going every day, while the Cranston machine with the giants cannot be operated daily short of 1,000 inches, which cannot be obtained from the ditch during the hot summer months. If the company could manage to run a smaller machine continually night and day, it would no doubt be better, as much time is lost by stoppage in allowing the pit to fill. Should the company realize a good clean up from the work of the Stombs elevator, they may probably enlarge the ditch to run the Cranston elevator day and night, on two of the Stombs elevators, while many think a bedrock tunnel may be built, which would certainly be the surest thing, and drain the whole creek bed in a natural way, far superior to any effort in raising water to the surface.

The latest operations with the Stombs elevator the past two days, prove the machine to be a grand success, since making the new additions, and extending the new and longer nozzle up into the hill at the end of the machine. It takes the water and gravel up about as extensively as the Cranston machine, if the same water power is used, though the machine is much smaller. The gravel can be raised to the hight of 50 ft., and the manufacturer guarantees that it will lift 48 ft. The advantage of this machine is the ease with which it can be moved, and the benefit of operating with a smaller quantity of water, as the Cranston elevator must have a great amount of water to work at all.—*Yreka Journal.*

THE Salt Lake *Tribune* claims that Utah possesses the biggest iron mines and most extensive coal deposits on the face of the earth. It is somewhat singular that Nevada lying between California and Utah and possessing largely the geological characteristics of both, does not contain a coal mine or a reliable coal indication, while coal exists in quantities in both California and Utah.

Hawthorne Items.

A correspondent of the Esmeralda *Herald* says: New mining districts are being made every few days in the vicinity of Hawthorne. Among the recent discoveries are the Ernest mine, situated eight miles west from Hawthorne and four miles northeast from the Big Indian and three-quarters of a mile south of Cat creek, and which is owned by A. C. Jenks and Wm. M. Grose. The average width of the ledge is three ft., and the assays made of the rock will average $100 to the ton. The boys are sinking an incline, are down 80 ft., and don't find any change in the character of the rock or the size of the ledge. The boys feel jubilant over their strike, and are confident that they have a bonanze in their mine.

The Bull of the Woods mine, discovered a short time ago, which is situated some six miles west from here, and owned by R. H. Morey, Norton and Crassy, is said to pay over $100 to the ton on the average. The ledge is two ft. wide, and can be traced over a half a mile, and when the company get fairly to work taking out the ore they will astonish the natives with the bullion extracted therefrom.

The Star & Banner Con. mine, situated near the head of North canyon and about 10 miles northwest from Hawthorne, is owned by M. S. Blunt, Jim Buchanan, L. McNeill and Jim Carrigan. The company have run a tunnel 110 ft., and have drifted 40 ft. on the ledge, the average width of which is 3½ ft. Six assays gave returns of $60 per ton. The company is now making arrangements for the construction of an 8-stamp mill. They expect to have the mill completed within two months, when employment will be given to a large number of men.

It is rumored that the Candelaria branch of the C. & C. railroad will be pushed forward some 12 miles immediately, and when completed the Candelaria and Belleville stage will be withdrawn from Hawthorne to connect with the cars at the end of the road for different points in the eastern portion of the State.

SUTRO TUNNEL.—In the main Sutro tunnel the south posts of the timbers near the Combination connection have been put in. A small fan has been erected at the north lateral junction, which is driven by a small compressed air engine, affording an abundant supply of pure air to the men working there. The general ventilation of the main tunnel has been greatly improved of late by putting in a partition and door at the connection of shaft No. 2, making that shaft a powerful downcast. The improvement is apparent as far west as the Combination connection. In the south lateral 101 ft. have been driven; total, 4,357. The distance of face from Yellow Jacket turning point, 717.23 ft.; distance of face from Kentuck south line, 131.89 ft.; distance of face to Crown Point south line, 567.82 ft.; distance of face to Forman shaft, 2,610.08 ft. Total progress for the month of July, 334 ft. Nature of the ground in the face, timbering; character of rock in the face, propylite. All of the week's progress required timbering except the first 27 ft. The temperatures observed have ranged from 84° at tunnel entrance to 97° at shaft No. 4 and 106° at south lateral drill hole. The daily flow of water from the mouth of the tunnel was equivalent to 4,675,830 standard gallons. The recent developments in the south header have a very encouraging aspect. The average of the face of ore cut through assays $17. The ownership of the strike is open to dispute, and can only be decided by actual survey. The character of the quartz is white and sugary, such as is found in the mines of the Comstock.

ANDERSON'S SPRINGS.—The proprietors lately arranged new croquet grounds near the hotel, having converted the old grounds into a fine carp pond. Recently, 1,000 young carp have been placed in the pond, which seems well adapted for fish-raising. A telegraph office has also been opened, bringing the hotel into general communication with the outside world. Following is a list of visitors during the week ending July 31st:

J. H. Boswell, W. H. Rookes, J. P. Fritts, Willis Bryant, Santa Rosa; L. Huelsmann, Sacramento; A. Ryan, Benicia; Dr. J. K. Laine, Mr. Brown, Sacramento; Henry Levy, S. F.; John Simpson, Sacramento; James McCormick, S. F.; Daniel Friendly, Peter Shay, A. G. Johnson, Sacramento; Andrew Ryan, Benicia; Mr. H. A. Smith, Mrs. Smith, Virginia City; Mrs. C. Kopf, Miss B. Kopf, Miss Stella Cannon, Santa Rosa; Miss L. Furuchis, Miss S. Furuchis, S. F.; Mr. H. Webber, Carp Ponds; Mr. A. Maeds, Mrs. A. Maeds, Maed's Camp; Mrs. Belle Farmer, Miss Ollis Farmer, Miss L. McCall, Middletown; Miss Caddis Stoddard, Miss Clara Stoddard, Alhambra Mills; Mr. Swartz, Carp Ponds; Mr. Renikie, Mrs. Renikis, Mr. Butler, Mrs. Butler and child, Middletown; Mr. Coates, Miss Coates, Sopers Ranch; Miss May Baldwin, Miss Loe Kemp, R. S. Symington, Mrs. M. E. Symington, Danville; Mrs. Joice, Miss Gussie Hahm, Mr. R. Tidmarsh, S. F.; Mr. Ward, Yuma City.

IT has been decided not to assess the Tombstone mines for taxation. It is held that although there are several mines now producing bullion that should be taxed, it would be impossible under the law to tax them and allow to go untaxed the many mines that are now merely in progress of development.

ALL the mills in Tuscarora district, excepting one, are running. But Tuscarora mining dividends are conspicuous by their absence, and, like angel's visits, are few and far between. Nevertheless Tuscarora is one of the best outside camps in Nevada.

The Engineer.

A Gigantic Engineering Enterprise.

From tha headwatsrs of the Mississippi and tha northwestern extremity of Lake Superior a long, narrow valloy, known as Mackcazie's valley, commences, which continues npoa nu almost dead lsvel northwestward until it reaches tbo Arctic ocean, a distance of ovor 2,000 miles. This immsase valley is flanked on the west by the Rocky mountains, while npon its Eastern side nothing bnt a low table-lsnd separates it from the watera of Hudson's bay. No part of the valley reaches an elevation exceeding 650 ft. above the soa level, nnd tbrongbout its entire length it is covered at intervals with a great nnmbor of lskes, several of which, as Slave lake, Great Bear lake and Lake Winnipog, are abont cqnal in area to Lake Erie. Tha wters from abont twa-tbirds of this area flow northward into tho Arctic. The southern portion finds a drainage in Hndson's bay. It is said to be practical to throw a dam across tho Mackoazie's valley at n point near the latitudo of Slave lake, and anather nt a point through which a drainage is effected to Hndson's bay, hy which tha waters of this immense tract of country may be so impounded as to form a continuous lake some 1,500 miles in length by 200 in width. The sonthorn end of the lake would bs separated from Lake Saperior by a slight elovntioa, which might ho easily cnt through to a short affluent of Lake Superior, and through which steam navigation might ho readily established and made continuous for 1,500 miles or more, to the northern extremity of the artificial lake, and from thence, hy locks, into the Mackenzie river and tho Arctic ocean.

In addition to the new navigable area whicb would thus be estahlisbsd, this lake, hy a connection witb tho Mississippi, which could he easily effected, would also serve ns an immsnee reservoir for rendering the upper waters of that river navigable at all seasons of the year. It wonld furtbermore contribute the surplus wnter needed for the proposed ship canal from Cairo, Ill., to Lake Erie, which has been proposed as a straight line of communication throngb the lakes and St. Lawrence river, and Straits of Belle Isle, to Europe. These enterprises, so magnificent in conception, it is claimed, could he carried out at a cost qnite insignificant in comparison to the immense industrial and commercial advantages which would result from tbeir completion.

A Tunnel Through Mount Blanc.

The French government has for some time past heen contemplating tbe construction of a great railway tunnel whicb sbould hriag Pnris and the aorthern parts of France into more direct commnnication with Italy thsn is afforded by the existing tuanel tbrough Mt. Cenis. The projects proposed include a tunnel through Mt. Blanc, and another through the Simplon or the Great St. Bernard. Tae last of the three has found very few friends, hut it appears likely tbat hotb tbe former projects will be carried ont. The projected Simplon tunnel is 60,719 ft. in length, while tbat through Mt. Blnnc is 44,292 ft.

Comparing tbese with the otber Alpine tunnels, we find that the Mt. Cenis is 40,093 ft., and tbe St. Gothard 48,952 ft. long. Tho Simplon would, therefore, be the longest of all.

Since the execution of the Mt. Cenis tunnel, the piercing of the Alps or of any other range has become simply a question of time and money. M. Chandon, in bis pamphlet, "Le Percement du Mont Blanc," underestimated the difficnlties of tbe work. But in M. Berand's *brochure*, "Mont Blanc et le Simplon consideres comme Voles intsrntionales," the estimate of the magnitude and cost of these undertakings was sufficiently correct, and he sbowed tbat France could not afford long to do witbout tbis contemplated improvement.

ENGINEERING FEAT.—Tbe difficult task of removing ths grent iron tower erected for Centennial purposes in Philsdelphia, known as Sawyer observatory, has just heen successfully accomplished. It was 160 ft. in hight, 8 ft. in diameter at the hase, and weigbed 40 tons. By means of a pair of shears, formed of two massive timbers 90 ft. long, bitted with a block and tackle, the tower was swung from the center and lowered to the earth, wbere it will be separated into sections of 25 ft. each for removal to Boston. Tbis, it will he recollected, was the manner in wbich Lieut. Corringe took down tbe famous monolith, in Egypt, preparatory to its removal to New York.

COL. GILLETTE is in Chicago, purchasing machinery for a stamp mill which will be put up at tbe Ivanhoe mine, in the Black range, New Mexico. Tbe oro from tbis mine is free-milling, and can he easily reduced by means ot an ordinary mill. Nevertheless tbe cheapesn and best quartz mills in nse are those built if San Francisco.

ROBERT SMITH & Co., says the Nevada *Transcript* of July 31st, have erected n one-stamp quartz mill on Grizzly canyon, three miles above Colnmbia Hill, and have a very good prospect for opening a paying mine there. They have a three-ft. ledge from which a crushing was made recently witb a result of $20 a ton.

Useful Information.

Spontaneous Combustion.

A. Renonard, of Rouoe, France, has lately experimented with greasy rags to ascertain the degree of their inflammiability nnder certain conditions. He took for this purpose n quantity of cotton rags, saturated them with boiled linseed oil, wrung them out and placed them, togetber with dry cottoa, in a box about eighteen inches long, eight inches wide and two feet high, in which he put n thermometer in order to watch the increase of temperature. The room in which the experiment was made was kept under a temperature of 170° F. Tho mercury soon began to risa, and showed, within one hour and a quarter, 340° F. Smoke commenced to come tbrough tbe fissures, and as soon as air was let in the flames burst out.

In another experiment, made nnder tho same temperature, cotton, saturated with crudo linseed oil, ignited within five or six bours. Rapeseed oil caused ignition after ten bours. In another room, where the temperaturo was left at 120 F., cotton, mixed with a little olive oil and put in a paper, burnt after six honrs. Castor oil required more than twenty-four bours; whale oil, only four hours; and fish oil, two hours. Spermaceti oil, free of glycerine, did not ignite at all; neither did heavy tar, coal tar, or slate oils.

The above experiments show very clearly the necessity for a scrupnlous watching of oily rags, which are often too carelessly bandled in our cotton and woolen mills. Even n collecting of the rags every nigbt before the closing of tbe mill is not a sure preventive against the danger of fire. There sbonld he in every department of the mill where rags are used for cleaning machinery, an iron box, which can he closed very tigbt, and every hour or two a man sbould go around, collect tbe rags aad place them in tbis box, from which they can he taken every night and disposed of in some safe manner. Too much care cannot bo taken with these snbstances, and it is hsttsr to look out in time than after the accident has happened.—*Textile Colorist.*

MOTH PREVENTIVE.—A correspondent of the *Furniture Gazette* recommends the following remedy for exterminating moths in carpets and furniture: After some years of experience with the troublesome pests, says the writer, I found a sure preventive of moths in pitch paper, the samo as roofers use. The moth will live and grow on cayenne pepper and tobacco, while I never could see tbat the use of these articles kept the moth miller out. The plan is to cut the paper in slips and place about tbe room under and hebind sofas, chairs, etc. Tbis sboald be done as early as the middle of April, and in warm climates earlier. To make parlor seats motb-proof, place on the inside of backs of chairs and seats small strips of pitch paper and rest assured the miller will not select these places to deposit eggs. It is the miller that is the foundation of all the mischief.

A WOOD FILLER.—There are many fillers in use for porous hard wood. A correspondent of Von Nostrand's *Engineering Magazine* suggests tbe following as very good: "Take boiled oil and cornstarch, and stir into a very thick paste. Add a little japan and reduce with turpentine. Add no color for light ash. For dark ash and chestnut, use a little raw sienna; for walnut, burnt nmber and a slight amount of Venetian red; for hay wood, hurnt sienna. In no case use more color than is required to overcome the white appearance of tbe starch nnless yon wish to stain the wood. The filler is worked with hrnsh and rags in the usual manner. Let it dry 48 hours, or until it is in condition to rub down with No. 0 sandpaper, without much gumming up, and if an extra fine finish is desired fill again with the same materials, using less oil, hut more of japan and turpentine."

CLEANING BRASS.—Make a mixture of one part common nitric acid and one-half part sulphuric acid in a stone jar; then place ready a pail of fresh water and a box of sawdust. Dip the articles to be cleaned in tbe acid, then remove them into the water, after wbich rub them with sawdust. This immediately changes them to a brilliant color. If the brass is greasy it must be first dipped in a strong solution of potash and soda in warm water. Tbis cuts the grease so that the acid has the power to act. This is a government recipe used in the arsenals.

COMPOUND FOR THE TREATMENT OF STEEL.—A Mr. Conant, of Prarie du Chien, Wis., has patented a compound to he used in the welding of steel or in the restoration of hurnt steel, composed of sulphate or other salt of copper, resin and sal ammaniac. This is thrown upon the metal under treatment thereby becoming incorporated with it.

QUININE FROM COAL TAR.—A New York man is said to have discovered a process for the manufactnre of sulphate of quinine from coal tar. The trade in the article is a heavy one, and if the new process should prove to be as successful as it is anticipated by the inventor, it will cause a revolution in the trade.

PAPER plates, as well as paper napkins, are in vogne in Berlin restaurants. Each plate is used but once, of course.

Cultivating the White Water Lily.

Many of our readers, especially tbase from New England, will ever hold in remembrance the sweet fragrance of the white water-lily, so common in that part of the Union. If they only knew how easily it could be cultivated, we believe that very many of them would prepare and ho quita as proud of their lily gardens as of any other of their floral premises. The roots may ho easily sent from the East hy mail, packed in damp moss. The roots should he kept constantly moist, until planted.

To do that take an old tub or barrel sawed in two, that will hold water, set it either on top or in the ground, one-third filled with a mixture of garden soil, sand and well-rotted manure. The roots should be set in this mixture, and water added in small quantities, so as not to disturb the earth until the tub is filled. Very soon the handsome round leaves, four or five inches in diameter will make their appearance and fill the tub. The loss of water hy evaporation should be made good from time to time, and ere long the blossoms will appear, and delight everyone with their beauty and fragrance. Care should he taken not to allow the annual increase to crowd the vessel, or the floral display will be diminished. The pure white flowers will be as perfect and beautiful and fragrant as the camellia, closing at night and opening in the morning. The bloom of lilies thus transplanted are generally a little smaller than in their native ponds at the East.

There are several parties in this city now successfully cultivating lilies in this manner. A flourishing colony of these fragrant flowers may also he seen in the conservatory at the Park.

SOMETHING NEW.—A recent German patent employs two boilers, one of which uses steam at a much higher pressure than the other. High pressure steam is used in connection with the injector to carry a portion of the exhaust steam from the engine into the low pressure boiler. To the above a contemporary says: "It would seem to he a peculiar combination and much like a man's lifting himself over a fence hy taking hold of his boot straps."

CASTING BELLS.—All bells, says *Iron*, are cast with their notes sharp, and the flattening of the note is then accomplished hy turning away more or less of the inner surface of the lip. To sharpen a bell's note there must be a slicing away from the lip, and this cannot he done to any extent.

Good Health.

Nature's Dressing for a Wound.

The *Phrenological Journal* gives, through a correspondent, the following lesson from a toad: A few years since, while standing in the shade during the heat of the day, a toad hopped along at my feet and attracted my attention from having what appeared to he a very large forearm. Stooping down, I found that from the shoulder to the elbow-joint the fore-leg was encased in earth, which was very smooth, dry and hard. Inquisitiveness being well developed, I had, of course, a natural inclination to see what was inside, so holding "toady," with a piece of stick I broke the crust of hardened mud, and found, to my surprise, a large flesh wound extending from the shoulder to the elbow, half of the muscle being bruised and raw. From the smoothness of the work, I judged the dressing had been made from dry earth and the spittle of the toad, as it would be seemingly impossible for it to handle mud and apply it in such a manner.

I thought nothing more of the matter for a year or more, until one night one of my children retired with a very sore toe from some unknown cause, and about midnight was wild and restless with pain. I arose and opened the ulcerated part, and afforded him relief for the time being; hut the pain returned, and hy the next hour he was as restless as ever. After trying to give relief in various ways I thought of the toad, and, taking an old stocking, I put some mud, made of clay and water, into the toe part, and drew it on the child's foot. In 10 minutes he was asleep, and slept well the remainder of the night, and in the morning the toe appeared nearly well.

I have found that a mixture of earth and spittle is preferable, and I have used it since upon every occasion where remedies are necessary for the relief of ulcers or healing flesh wounds, and prefer it to any ointment or liniment that I have ever seen or made during many years' experience as a druggist.

The Liver.

In the opinion of the ancients the liver was the seat of the affections and of the passions. Modern research, however, has shown this to be an error, and hence less attention and care have been bestowed on this organ than in the early days when it was supposed to play so important a part in making war and cajoling love. Undoubtedly the discovery of the fact that the liver is not the seat of the affections and of the passions, has led the people, as is natural, to neglect what formerly was an object of great solicitude; hut the truth still remains that though it may not be the special seat of love and passion, it is, after all, of the greatest importance in physical health.

The structure of the liver is delicate and yet simple. It is composed of two lobes, which lie directly under the right lung, and is of a spongy character. When the venous blood is circulating from the various parts of the body to the lungs, it passes through this organ, and is there relieved of its rank poisons, part of which are used for digestion and part for a cathartic of the waste materials of the food we eat. If the organ is at all diseased *these poisons remain in it*, instead of being used as nature designed, and with every coursing of the blood through the lobes of the liver the nature of the disease is intensified, and hence a neglect of any disorder in this organ is almost certain to bring on chronic liver disease, so terrible to contemplate.

NATURAL DEATH is to die sweetly without a sob, a struggle, or a sigh. It is the result of a long life of *"temperance in all things,"* and such a death should be one of the ends and aims of every human being, so that we may not only live long, but in that long life he able to do much for man, and much for God. The love of life is a universal instinct; life is a duty, its peril or neglect a crime. We are placed on earth for a purpose, that purpose can be none other than to give us an opportunity of doing good to ourselves and to others, and to be anxious to be *"off duty"* sooner than God wills, is no indication of true piety. The good man has one ruling, ever present desire, and that is to live as long on the earth as his Maker pleases, and while living to do the utmost he can to benefit and bless mankind, and to accomplish a long and active, and useful life, the study how to preserve and promote a high degree of bodily health is indispensable. And it seems to have been ordained by a Providence both kind and wise, as a reward of a temperate life, that such a life should he largely extended, and that its decline should he as calm as a summer's evening, as gentle as the babe sleeps itself away on its mother's bosom.—*Herald of Health.*

SALICYLIC ACID FOR BEE STINGS.—Although salicylic acid, from having been too highly extolled, has fallen somewhat into disfavor, there can he no doubt that it is useful in the case of bee stings. An Austrian paper recommends the following treatment: First, to remove the sting as quickly as possible with a forceps or by scratching with a finger, but never between the thumb and forefinger, because this squeezes more of the poison into the wound. Next, squeeze the wound until a drop of blood comes out, and rub the place as large as a dollar with an aqueous or dilute alcoholic solution of salicylic acid. The effect is still better by injecting the salicylic acid into the wound with the hypodermic syringe. After this the spot is painted with collodion to keep out the air. A sting treated thus causes little or no pain, slight inflammation and swelling, and is not followed by nettle-fever or lameness in the most sensitive and nervous individuals.—*Scientific News.*

FATAL PLAYTHING.—A Baltimore paper of July 11th says: A number of children have died here during the past few days from lock-jaw, superinduced by slight hurns received in the hands from the exploding of paper caps in toy pistols on the Fourth of July. In every instance where these accidents have occurred the dread disease has followed like a strange fatality. The physicians are unable to account for the singular appearance of the disease. The injuries have been so slight in some cases that only the skin of the hand was slightly burned. It is thought the caps contain a poison never before used in their manufacture, and the health authorities are about to investigate the matter. Eight deaths have been reported within the past twenty-four hours, and a number of new cases have been reported to-night. The sufferings of those afflicted have been terrible and beyond all medical assistance.

DIRECTIONS FOR PREVENTING SUDDEN DEATH. An exchange offers the following as the best known means of preventing sudden death: 1. Keep the head cool by taking the world easy. 2. Keep the lungs breathing deeply and fully about 17 times a minute, by cultivating alacrity in all the bodily movements. 3. Keep the heart beating about 68 times a minute (that is, let the pulse beat four times while the lungs breathe once) by eating temperately, sleeping fully and soundly, exercising moderately, and avoiding all temporary excitants, mental or liquid.

THE GASTRIC JUICE, when vitiated, as it always is in dyspepsia, poisons instead of acting as a solvent of the food, which decomposes in the stomach, giving birth to an acid, that, rising in the throat, stings the palate, and causes the disagreeable sensation called heartburn. Carbonate of soda and other means are often resorted to for the purpose of remedying this, but with no permanent good effect. The wiser way is to eradicate the atrocious disease, which originates this and a hundred other harassing symptoms, by a suitable diet. If that does not produce the desired effect within a reasonable time, call a physician.

DEATHS FROM OPPOSITE CAUSES.—A French newspaper relates that a millionaire lost his entire fortune, except about 100,000 francs, and died of grief within the 24 hours. His brother, who was his sole heir, had long struggled in poverty, and now, on the sudden receipt of what he regarded as a large fortune, has just died of joy.

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Passing Events.

The severe trial through which the President has passed during the week has absorbed the attention of the whole country. At this writing, Thursday night, symptoms are more favorable and a more hopeful feeling is apparent.

It is said that men have been put to work to explore the body of quartz cut some time ago by the south branch of the Sutro tunnel, at a point 300 ft. east of the Yellow Jacket shaft. It is certainly a deposit worth being looked after. It would seem by the rapid manner in which it widens to the northward, that what has been found is the extreme southern point of what may prove to be a first-class deposit.

A new discovery of a rich 10-ft. ledge has been made about two miles from the C. P. R. R. and seven miles west of Palisade. The people are said to be wild with excitement, and are all rushing to secure claims, town sites and water rights. The mine, being near the river with plenty of water and good water power, makes this a desirable location.

We give in this number of the PRESS a number of interesting articles worthy of careful perusal by all mining men. That by Mr. Attwood showing ancient systems of gold mining is of special interest.

The Mechanics' fair, now in progress in this city, attracts a great deal of attention, and is a success in every way. We shall next week give a complete catalogue of the exhibits, with descriptions of the more prominent ones.

THE July dividends of various mining incorporations disbursed in San Francisco, New York, Boston, and Philadelphia, amounted to $751,800.

Tonite Powder.

Interesting Experiments with the Powder at the Works.

On Saturday last a number of gentlemen were invited to the Tonite Powder works, near Stege station, C. P. R. R., to examine the process of manufacture of the powder and witness some experiments to demonstrate its strength, utility and safety. Some 70 persons accepted the invitation, among them scientists, engineers, miners, powder men, etc. It was, in our opinion, rather a compliment to the powder that so many were willing to visit the works, powder manufactories and pest houses, being among those places which the general public are reluctant to visit. However, those who did come were repaid their trouble in witnessing a series of well-conducted and interesting experiments, carried out in a manner reflecting great credit on General Manager Oliver, who gave all necessary information to the inquiring visitors.

The Works.

Probably before giving any detail of the experiments, it will be well to describe briefly the works of the company and the process of manufacture of the powder. The grounds consist of some 26 acres, suitably fenced. In the central portion are the buildings for the manufacture of Tonite powder, consisting of the large main building, engine and boiler room, office and factory, the cartridge buildings, packing-house, labeling room and storehouse. Each of these buildings is separate, and they are some distance apart. To the right of the group are a number of very small buildings, where are made the exploders or caps. In this department each man has a small house to himself, the whole being detached from the main powder works. To the right again, are the three large new buildings for the manufacture of black powder, these also being at some distance from the Tonite works. An endless wire rope from the main engine conveys the power to the black powder building. The large boarding-house is at the entrance of the works. The whole plant is admirably arranged, and some idea of its completeness may be learned from the fact that the machinery buildings, etc., cost $130,000.

Process of Manufacture.

The manufacture of Tonite powder is quite complicated, and requires much machinery when compared with that of other explosives in use. Most powders are made in one day, or at most two days, but Tonite requires between two and three weeks from the time the operation commences until the powder is ready for packing. During the process of manufacture the powder is either entirely or partly in water, and is not explosive at all until the last day of the operation, when it is ready to be packed into cases; hence no accidents have occurred during the manufacture of Tonite, which has now been going on for six years.

Tonite powder is a gun-cotton powder, and contains no nitro-glycerine, the gun cotton being rendered non-explosive, except under certain specified conditions, by the peculiarities of manufacture.

In the first place the ordinary cotton, wool or other vegetable fiber is thoroughly washed, cleaned and purified. It is then taken out and steeped or digested in a mixture of nitric and sulphuric acids. This is done in large earthenware pots having covers. The men who have charge of this part of the work have an unpleasant task, breathing through sponges and wearing rubber clothing, gloves and boots. The soaking mass is lifted and placed in a press where the superabundant acid is squeezed out by hydraulic pressure. It is immediately returned to the earthen pots, which are quickly set in shallow vats or tanks through which water is constantly passing and where a uniform temperature is maintained.

After a suitable time the pulp is removed from the pots and then it is carefully washed until all traces of acids are removed. This simple operation converts the cotton into what is known as gun cotton. Revolving knives cut it up into a paste. It is then crushed under rolls and again washed by a process peculiar to the Tonite company, and not employed by other gun cotton manufacturers. During the purification process, samples are taken regularly of every batch of 200 lbs. and tested—

1st. For percentage of gun cotton, etc.
2d. For decomposition by heat.
3d. For degree explosibility.

In the second test the powder is subjected to a steadily increasing and prolonged heat, and if it shows the slightest tendency, by means of specially prepared delicate test papers, to decomposition at a temperature under 250° Fah., the batch is repassed through the purification process. In the third test the powder is subjected to a temperature of 300°, which is gradually raised to 400°, and if it explodes before it reaches 360° to 370°, it is passed through an extra cleansing operation and again sampled and assayed.

When the tests are all found to be quite satisfactory, the other ingredients are added which convert the gun cotton into tonite, the whole being ground and mixed. The nitrate of baryta has the effect of so changing the qualities of the gun cotton as to admit of its being handled with perfect safety, and preventing any decomposition. In fact we saw samples of tonite five years old exploded in the ordinary way, showing that the compound was a stable one not liable to deterioration or alteration by age.

When the powder is thus made it is compressed into cartridges by the aid of powerful presses. At each of these three men work; one weighs, one fills the press and the third removes the cartridge and cleans the mold. Different series of molds are used for different sized cartridges. The cartridges are wrapped in paper and then dried in drying-rooms, and are now for the first time rendered explosive, but even then it is a singularly insensitive material, as will be seen from the experiments referred to hereafter.

No powder is made into cartridges until it has resisted all of the above severe tests, the standards of which, adopted by the company here, are higher than those established by the British government before the powder is admitted aboard its men-of-war. Consumers of Tonite can therefore rely upon the quality and safety of the powder they are using, as the company makes one and only one grade and one quality of powder.

So much for the manufacture of this powerful explosive which is quite simple when the results are considered. The experiments with the powder showed its character very plainly to all who witnessed them. We shall detail them in the order in which they were exhibited.

The Experiments.

1. This was to show the safety of manufacture. A lighted torch was thrust into a quantity of loose powder ready to be made into cartridges. Being damp, it did not at first burn, but on drying, part of it burned slowly but did not explode.

2. A number of freshly made cartridges were laid loosely on top of a piece of Giant powder cartridge, and the latter exploded in the usual manner. This severe test had no effect on the Tonite.

3. This and the following were fire tests. A number of dry cartridges were lighted, and they burned away with a yellowish flame, but very little smoke.

4. This experiment was repeated with three varieties of nitro-glycerine powders, to show that they burned more rapidly and emitted more smoke. Some of the insurance men present then called for an extra test, to see whether a burning cartridge of Tonite could be extinguished with water, and whether a spray of water would (by its decomposition) increase instead of decrease the combustion. Four large cartridges were set on fire, and when freely burning, the superintendent was asked to throw a fine spray upon them. This was done, but no effects were visible. A heavier spray was thrown, but that made no change. Then the stream was turned on and the burning cartridges were extinguished. This was to the insurance men a very satisfactory test, showing that an incipient fire among a lot of cartridges could be arrested, and that a spray of water would not add to the flames.

5. This and the following were friction tests. A Tonite cartridge was rapidly filed with a sharp new file, but it did not explode or take fire.

6. Another cartridge was rubbed to dust on a rubbing machine under a muller, both box and muller being roughened with powdered glass. This heated the powder, but did not set it on fire or explode it. This test was so severe, some thought the cartridge might have been prepared, but the superintendent took a cap and exploded the powdered cartridge.

7. This and the following were percussion tests. Three cartridges of Giant, Hercules and Vulcan powders were placed in a row, and 24 inches apart, each on top of a separate spiked stick. The Hercules cartridge was in the center, and was fired at from about 100 ft. with a Winchester 1,000-yard rifle. The blow of the bullet exploded the Hercules cartridge, and its explosion exploded the others on each side of it.

8. Three cartridges of Tonite were placed on the sticks, and when the center one was struck by the bullet from the rifle it was broken in two but not exploded. The other two were treated in a similar manner, and none of them exploded.

9. This was a concussion test, as was that which followed. A cartridge of Tonite was placed between a cartridge of Giant and one of Hercules, 24 inches between each, and the Tonite was exploded with fuse and detonator. When the Tonite went off, the others also exploded.

10. This was a crucial test of the powder. A cartridge of Tonite was placed only four inches from one of Giant; and another cartridge of Tonite was placed only four inches from one of Hercules, the space between the Hercules and Giant powder cartridges being 24 inches. The Hercules and Giant were simultaneously exploded (the discharge of one firing the other); but the Tonite cartridges did not explode. They were blown to fine dust, some of which lodged on blackened prepared boards placed near by. This proved conclusively that the concussion required to explode the Tonite was greater than that required to explode the others.

11. An ounce of Dupont black powder was then put in a mortar and a tight-fitting cartridge of Tonite rammed upon it, and the gun powder fired with fuse. The Tonite, even under this test did not explode. A piece of the broken cartridge which fell was recovered and exploded by means of the cap.

12. The same experiment was repeated, but this time the Tonite had a detonator and time fuse attached, to enable it to ascend 600 ft. before exploding. A number of these rockets were sent up, such as are used for fog signals by the English government at stations where steam whistles or sirens are used, while steam is being raised. Some of the rockets have stars and serpents, which fly out when the cartridge explodes.

13. Was to show the strength of Tonite and that it had a downward force like nitro-glycerine. This test was omitted, as it had already been determined by exploding cartridges laid on heavy pieces of timber.

14. Holes in the ground were fired with Tonite and dynamites. There was no means of measuring any difference in results.

15. Several Tonite cartridges were thrown into the bay and detonated, throwing up heavy columns of water.

16. A heavy iron weight rigged up similarly to a pile driver, so as to drop on a heavy iron anvil, was allowed to drop on a piece of Giant powder cartridge from a hight of five ft. Between these two iron surfaces the Giant was exploded, the weight probably squeezing out the nitro-glycerine and exploding that. At all events, it blew up and broke the ring off the weight. When that was repaired a piece of Tonite cartridge was tried.

17. With the Tonite cartridge placed on the anvil, the weight was this time hoisted 24 ft. instead of 5. It dropped and mashed the cartridge, but did not explode it. This was a very severe test.

18. The same experiment, 24 ft. drop, was tried on boxes of Tonite. The weight was dropped on one box with its cover on and on another with the cover off, but no explosion resulted. Some of the broken cartridges were then exploded by means of caps.

19. Several boxes of Tonite were thrown on a large bonfire saturated with coal oil. The cartridges burned, but did not explode.

This concluded the experiments, which, if the reader has followed us, will be seen to have been very thorough in every respect, and to have proved that this high explosive can be subjected to very severe tests of safety, fire, friction, percussion, concussion, strength, etc. All this has, of course, been proven in Europe, where it has been for some time in use, but here it is comparatively new, though now being rapidly introduced.

The company have also the only factory for caps and detonators in the United States. They manufacture Giant triple-force caps, Ætna caps and Tonite detonators. The Tonite detonators have to be made about three times as strong as the ordinary ones, very great force being required to explode the Tonite cartridge. We shall at some future time describe the cap more in detail.

Organized Arizonians.

Several meetings of former Arizonians and those now residents of that Territory, but sojourning in this city, have recently been held at the Palace hotel, which finally resulted, on Monday evening last, in a permanent organization on a business and social plane as "The Mining Bureau of the Territory of Arizona," with the following officers: President, J. F. Knapp, of Yuma; Corresponding Secretary, David Rich, of San Francisco; Executive committee, W. A. Rowe, of Yavapai county, W. A. Caldwell, of Mohave, G. C. York, of Apache, L. C. Hughes, of Pima, Donald Rohh, of Gila, R. Cohen, of Cochise, J. W. Dorrington, of Yuma, J. W. Stevenson, of Graham, J. W. Anderson, of Pinal, and Joseph A. Drew, of Maricopa.

Arrangements are being made with Prof. H. G. Hanks, of the State Mining Bureau, for a proper display of all mineral specimens which may be forwarded to him. It was stated at one of the meetings, that at all times of the year, there are from 200 to 300 Arizonians in this city, and any organization which will bring them together will be of advantage in both a social and commercial point of view. Greater interest and a more close union would also be thus kept up between the people of Arizona and the merchants of this city.

The office of the association has been located for the present at 212 Sutter street. It will be under the immediate charge of Mr. Hanks.

An Extra Edition.

We shall next week issue a 24-page edition of the MINING AND SCIENTIFIC PRESS, with a catalogue of the exhibits of the Mechanics' Institute Industrial Exhibition now in progress in this city. This edition will contain also descriptions of many of the more prominent exhibits of the fair.

We have prepared several articles of special interest for this extra number, among them a fully illustrated one of great value showing the various attempts to perfect the cable railroad system. A prominent view in Golden Gate park will be one of the interesting illustrations. Numerous other articles on mining, metallurgical and mechanical subjects will appear. We shall print a very large edition, and this number will be one of value for reference and preservation.

BUTTE, Montana, is now within 30 hours' travel of Salt Lake. When the Utah & Northern is completed, the time will be shortened about six hours.

Mining in Mendocino County.

The Mendocino flume and mining company is a new incorporation having for its object the flumming of lumber from the redwoods 20 miles northwest of Ukiah, the county seat of Mendocino county, to Calpella, six miles from Ukiah, and in the line of the proposed new railroad from San Francisco to Humboldt bay, and north to connect with Villard's Northern Pacific, and the mining of some 800 acres of gold-bearing surface diggings near Calpella. The company is incorporated in Boston, where most of the stock is held, and the officers reside. They have acquired title to the mining ground, and purchased some 2,000 acres of timber land including a fine sawmill and a lake three-fourths of a mile long and 70 ft. deep, which it is proposed to tap for additional water supply should other sources at any time fail. The gold is fine, and found in the grass roots and all the way down as far as prospected, bedrock never yet having been found.

The soil is a light sandy, washed gravel, easily worked, with no clay known. It has never been worked except a little during the rainy season with rocker or tom, when from $2.50 to $4 per day was made. The company only began work in the latter part of July, and are now engaged in building a temporary reservoir and the permanent flume, for taking lumber and water to their mining ground and Calpella, 12 miles distant. Three tunnels will be necessary. The dam across Mill creek ravine is progressing as fast as possible. It will be 150 ft. long and eight ft. high, built of logs, brush and earth, and faced with heavy planks, which will be sunk to their places with a pile driver. The head dam will be 80 ft. long and eight ft. high.

Flume work is proceeding briskly. A mile of trestle is in place, and water is flowing through three-quarters of a mile of 36-inch flume, carrying material for its extension.

Nine men are working on Smith's tunnel, which will be 315 ft. long when completed. The total number on the pay roll is 91.

Carpenters have been building cabins for some of the directors, who will come from the East shortly.

Mr. Bellows, the Supt. (and who built the Miocene flume), has endeavored to obtain iron for a tramway, to convey logs to Reeves' mill; but such was the demand for iron that his order could not be filled earlier than November.

Donahue has a surveying party in the field above Cloverdale, looking to an extension of his road, and Villard has had four parties out this spring above Ukiah. With these indications this mining camp is likely to be lively.

Electric Lights in Mines.

We have several times referred to the Swan electric lamp now in use in England, more particularly relering to its use in mines. It is worthy of note now that the Royal Commissioners upon Accidents in Mines, including Prof. Abel, Mr. Warington Smyth, Prof. Tyndall, and others, have made an examination of the experiments on the application of electric lighting to coal mines, which are being carried out at the Pleseley colliery, near Mansfield. The pits are about 1,600 ft. deep, and the workings are very extensive, but in the present instance the light was applied to three workings only, situated at a distance of about one-third of a mile from the bottom of the pits. The Swan system was adopted, and the arrangements were carried out by Messrs. R. E. Crompton & Co. The lamps themselves were enclosed in lanterns of a very ingenious construction, designed and made by Messrs. Crompton, which enabled the very fragile glass bulbs to be carried about without fear of accident, and at the same time rendered it impossible that the fracture of the lamp within could cause an explosion, inasmuch as the air inside the lantern would suffice for the instantaneous combustion of the carbon filaments before the flame could be communicated to the external air. In working the coal, the men undercut the face to the depth of some five or six ft., and the superincumbent mass is then brought down by wedges or blasting. It is said that the new lamp was found to be admirably suited for the requirements of the workers, since it not only gave a light many times as intense as the lights it replaced, but it was equally brilliant in whatever position it was placed, and it required absolutely no attention. In addition to the lamps which were used in the actual workings of the pit, the pit bottom was lighted up with similar lamps. The number of lights employed was 94 in all, which were worked by the current of an ordinary Gramme machine driven by a portable engine placed near the top of the upcast shaft.

THE EXPLOSION AT MAZATLAN.—A disastrous explosion occurred at Mazatlan recently. One from there places the loss of life at 100 killed; another says 35 killed and 60 wounded; another says 50 killed. The powder was not in a magazine, but in a dwelling house where people were cooking, etc. The house took fire at 6 A. M., and some persons in the vicinity, knowing of the presence of powder fled, thus saving their lives. Others not knowing of the powder, or delaying their flight, were killed. We are informed that there were 5,000 pounds of Dupont black powder, 4,000 pounds of Giant, and 1,100 pounds of Tonite; enough in all to have blown Mazatlan into "kingdom come." The only wonder is more people were not killed.

Registering Mine Ventilation.

About a year ago, Mr. Joseph Dickinson, H. M., Chief Inspector of Mines and President of the Manchester Geological Society, called attention, in his annual report, to the need of an automatic or self-registering apparatus for recording the periodical revolutions of ventilating fans and the weight of the water gauge at mines; the subject having come formally under his notice and been represented to him when assisting in the investigation of the Risca explosion last summer, as well as from instances which be afterward found in going into the matter in his own district.

Mr. Dickinson's suggestion was taken up, and a firm at Manchester has begun to make an instrument for the purpose, which he described at a recent meeting of the society. The appliance is a modification of Messrs. Bailey's well-known clock recording apparatus, and consists of an eight-day clock, which drives a drum about 8 in. diameter, to which is attached a paper divided into all the hours of the week. As the drum revolves, the fluctuations of the air passing through the mine are recorded upon it, up to 6 in. of water-column pressure. The speed of the engine when the fluctuations occurred is also recorded upon the drum by means of a pricker, which punctures a diagram once for every 5,000 revolutions of the engines connected with the ventilating apparatus. There is thus given in a concise form the speed of the engines and the fluctuations of the air pressure for every hour during the week's work. Mr. Dickinson added that, if desired, there would be no difficulty in constructing a modification of the instrument which would show also the fluctuations of the atmospheric pressure. He hoped to see instruments such as these become general at all collieries where ventilating fans were in use.

THE bullion product of Storey county, Nevada, according to returns to the Assessor, for the quarter ending June 30, 1881, was as follows: Belcher $42,525, California $46 880, Con. Virginia $32,558, Crown Point $116.755, Con. Imperial $29,103, Monte Cristo $6,600, Savage $5,719, Sierra Nevada $92,338; total $372,528. The total for the previous quarter was $426,353, making a total for the first six months of 1881 of $798,881, against $2,754,796 in the same time in 1880 and $4,325,479 in 1879, showing a steady falling off. The product for the first six months of 1881 was only about a week's yield in 1875.

DURING the first three weeks of July the Ontario mine produced $177,400. The usual dividend of 50 cents per share was paid in New York this week.

Automatic Mine Draining Apparatus.

Joseph R. Wilcox and Chas. D. Farquharson of this city have just obtained through the MINING AND SCIENTIFIC PRESS Patent Agency, a patent on an apparatus for raising water from wells, mines, etc., the principle of which invention is the same as that set forth in a previous patent to Wilcox in 1879, in that a column of water is made to accomplish the desired result. The present invention, however, differs from the former in a simpler construction of its parts, whereby they are enabled to dispense with the cumbersome double pipes and double columns of water and use but one actuating column of water and one pipe.

The invention consists, briefly, of two sets of cylinders, each set composed of two cylinders having pistons, the pistons on each set being connected so as to move together. One set of cylinders is placed in a mine or well, and the other set is placed at a point outside, lower than the position of the first set. A pipe passing from the inside set up the shaft of the mine or well and over the top down to the outside set, connects the two. This pipe is filled with water. The inside set is provided with a suction pipe, the outside with a discharge pipe. Appropriate weights, valves and operating cocks, control and operate the device.

The object is to raise water from mines and other places, or such localities as offer facilities for a proper fall, this object being accomplished by a very simple application of the heavier part of a column of water to a series of pistons moved by said water.

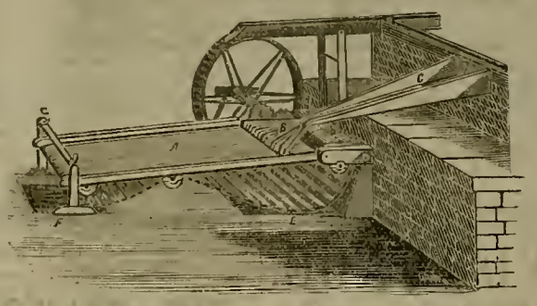

FIG. 2.—BRUNTON'S ORE DRESSING FRAME.

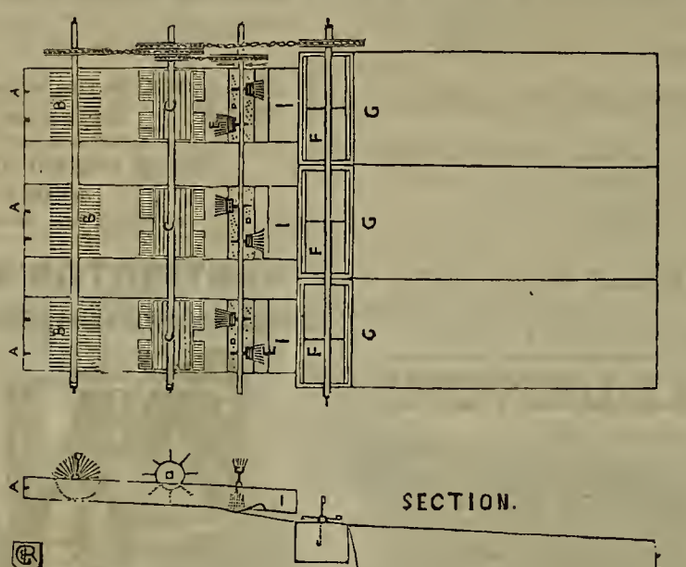

FIG. 3—ATTWOOD'S MACHINE FOR TRUNKING SLIME.

Fig. 4—The Modern Rocker.

THE Calumet & Hecla copper M. Co. of Michigan has declared a quarterly dividend of $5 per share, equal to $500,000, payable in Boston yesterday. This makes a total of $19,850,000 paid out in dividends by this company. Outside of the California and Con. Virginia, no mine in this country, as far as we know, can present such a record.

The Milling of Gold Quartz.

[CONTINUED FROM PAGE 113.]

phurets the pyritic matter varies from 70% to 90%, and about 75% of it will pass through a sieve of 100 holes to the linear inch.

The following analyses were made by John A. Phillips, F. G. S., and published in his Metallurgy of Gold and Silver. I lately received a letter from him, wherein he tells me he is going to publish another work on gold:

Analyses of Auriferous California Pyrites Concentrated from Tailings by John A. Phillips.

	From Grass Valley.	From near Sonora.	North Star, Grass Valley.
Sulphur	40 700	37.250	43.720
Arsenic	.310	8.490	1.360
Iron	41.050	30.540	39.250
Copper	trace.	trace.	.220
Lead	trace.	.400	trace.
Gold	.037	.302	.026
Silver	.030	not	.012
Cobalt	.030	determined.	.150
Silicia	10.970	17.150	14.230
Totals	99.703	100 162	98.968

Per Ton of 20 Cwt.

	Oz.	Dwt.	Gr.	Oz.	Dwt.	Gr.	Oz.	Dwt.	Gr
Gold	12	2	0	93	13	0	8	10	0
Silver	11	10	0				3	18	0

The condition of most of the Gold in Californian Sulphurets is much the same as that met with in the St. John del Rey mines, and if treated in the same way will amalgamate as easily. It only wants to be reduced a little finer. It will be time enough to adopt any of the new processes for the treatment of *rebellious gold ores* when they discover *any other ore* of gold, except telluric gold, which, so far, has only been met with in small quantities. In a pamphlet published by Mr. Kitto on the Gold Fields of Victoria as far back as 1867, Mr. Kitto states that the average

Cost of Mining and Milling

Of the gold quartz in the Victoria district was under 13%. say, $3 per ton. Some of the mines were deeper than those in the Bodie district, and the veinstone much harder to stamp, and the gold, unlike that of Bodie, which is mostly free, was mechanically mixed with the pyritic matter, and consequently much more difficult to save. The Port Philip Co. had, up to 1866, stamped 388,681 tons of veinstone, which yielded gold equal to six tons of 2,000 lbs. each. For four weeks' returns, October of that year, the quantity of quartz stamped, 4,342 tons, yielding 1.355 oz. 10 dwt. of gold, an average of 6 dwt. 5½ grains per ton—a little more than $6. The receipts were £5,944 4s. 6d.; payments, £4,300 13s. 7d.; profit, £1,643 10s. 5d.

The introduction of the Comstock pan system may have caused the shutting down of the Mammoth and many of the Bodie mines which produce low-grade ore. The wet-stamping of rich silver ores is a great mistake, and even in the wet-stamping of low-grade silver ores, unless they contain a large proportion of chlorides, they should be concentrated before amalgamation.

Concentrations on a small scale can be made much closer with the Bates than any other instrument, and consequently it is very useful in checking the working of large machines.

A great deal of useful information may be obtained from "Baron Inigo Born's" book on "Amalgamation," published in 1791, wherein he describes and illustrates with drawings, the process of "Movable Casks for Cold Amalgamation.

Careless Working.

A copper miner who understands anything of his business, would be horrified if you were to propose to him to work his mine after the fashion of some of our silver mines; that is, neglect to make a careful assorting of the richer ores when broken underground, and at the grass to mix rich ore with comparatively waste rock, and then pass them together through the stamps, taking the chances afterward of whatsoever they may be, to recover the ore by pans, etc. He would tell you how much would be lost and carried away in suspension with the water, and what a large proportion would go to enrich the slime pits.

In the treatment of low-grade silver ores the concentration of the ore after stamping by such a machine as the "True concentrator," would, I think, reduce the cost of milling and at the same time save more silver. I take this opportunity to express the pleasure it gave me on visiting

The State Mining Bureau

To see how well and with what great taste the collection we presented to that institution was arranged, and also the satisfaction I felt that the joint labor of so few should have been so soon crowned with success. We must not forget, however, that through the liberality of Mr. John Mackay we were enabled to send the collection to the Paris exhibition of 1878, where it won for this State a gold medal—proving its great value.

In the Mining Bureau it may be said to have formed the nucleus of a collection for industrial purposes which has already grown so rapidly that it is superior to any on this coast, filling a gap so much needed; indeed at the rate in which donations of minerals, etc., are pouring in, that institution will soon become a place of great resort, and the public will then feel grateful and award to Mr. Joseph Wasson the praise he so justly deserves for the forethought and trouble he has taken to procure for them an institution of such a useful character.

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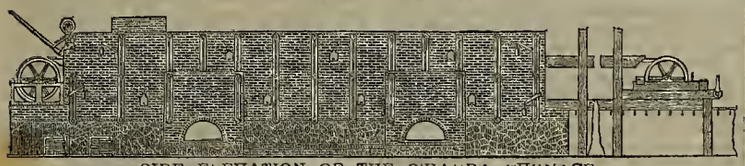
Patented in 1878.



SIDE ELEVATION OF THE O'HARRA FURNACE.

This Furnace is Constructed with two SEPARATE HEARTHS, one for DESULPHURIZING and one for CHLORIDIZING the Ore.

BOTH PROCESSES ARE PERFORMED AT ONE OPERATION.

—o—

An endless chain carrying conveyors or scrapers passes continuously through over both hearths, going one way through one chamber and the other through the other chamber. By this means the ore is fed and discharged at the same end of the furnace.

A cheap Furnace to build and to run.

The process is essentially the same as the well-known Freiberg process; but the mechanical devices applied to the furnace and the peculiarity of its construction enable the inventor to thoroughly desulphurize and chloridize the ore to a higher percentage than other furnaces, and with less cost for fuel and labor.

At Washoe and Ophir Tailings Mill it costs $1.10 per ton to work 40 tons in 24 hours.

At the Exchequer Mill, Alpine County, 20 tons are worked in 24 hours, at a cost of $2.61½.

Lewis Chalmers, of the Isabella G. & S. M. Co., Silver Mountain, Alpine Co., says: The O'Harra Furnace did all that is represented in the MINING AND SCIENTIFIC PRESS, roasting and chloridizing at the figures there given, antimonial and arsenial sulphurate of silver up to from 84% to 95% of the assay.

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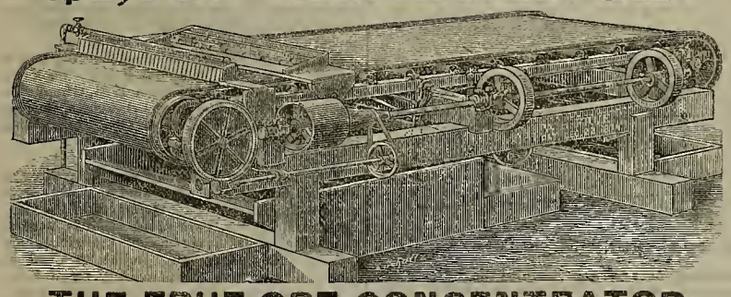

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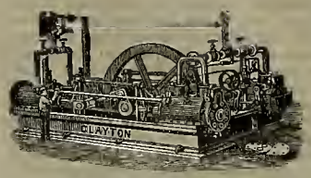

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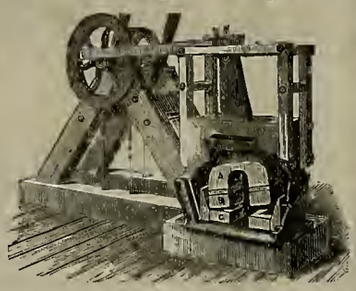

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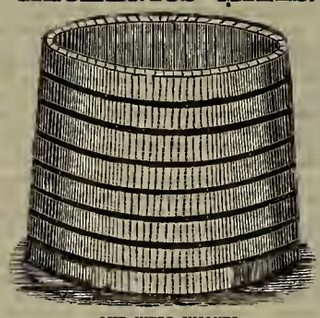

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NOTICE.

The office of the STETEFELDT FURNACE CO., having been removed to New York, parties wishing to obtain information in San Francisco about the Stetefeldt Furnace will apply to Messrs. Prescott, Soott & Co., Union Iron Works, San Francisco. C. A. STETEFELDT.

THOS. PRICE'S
Assay Office and Chemical Laboratory,
524 Sacramento St., S. F.

SHEET IRON PIPE.

FRANCIS SMITH & CO.,
Manufacturers of
THE PATENT CHANNEL IRON WHEELBARROWS.
THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand

SHEET IRON PIPE.
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Artesian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.
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SHEET IRON PIPE.

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MACHINERY!
Sole Agents for the Pacific Coast for

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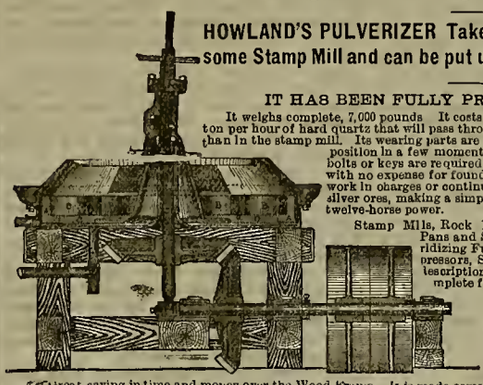
Also on hand and for sale A FULL LINE OF MILL AND MINING SUPPLIES.

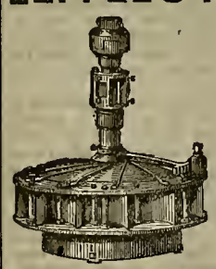
MOREY & SPERRY,
MANUFACTURERS OF
Gold and Silver Grinding and Amalgamating Machinery



HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.

IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies. Iron Work complete for Wood Frames, also
SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.
☞ Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
MOREY & SPERRY—Warerooms, 92 and 94 Liberty St., N. Y.

LEFFEL'S IMPROVED WATER WHEEL.



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The "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.
Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
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STEEL CASTINGS
FROM 1-4 TO 10,000 lbs. WEIGHT.
True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
CRANK SHAFTS, SHOES, DIES and GEARING specialties.
Circulars and Price Lists free. Address
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IRRIGATION! LAND RECLAMATION.
The Turbine Pumps.
3,000 to 15,000 Gallons a Minute. Strong, Durable & Cheap.
SAN FRANCISCO TOOL CO., No. 21 Stevenson St., San Francisco.

SELBY SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.
Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
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GOLD, SILVER and LEAD
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DuBOIS' Automatic Quicksilver Feeder.
A machine for feeding quicksilver to the mortars of GOLD MILLS. It is so connected to the cam shaft, that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a mechanical movement, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding ordinary hand-feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect. Price complete, $100.00. Send for circular,
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DODGE ROCK BREAKER
Challenges the World
To produce as good and cheap a Machine. Rock Breaker and Cornish Rolls combined in one Machine. Pulverizers, to Granulate Ores, for Roasting, Chloridizing, Leaching and Concentrating.

Concentrating Machinery!
FOR CONCENTRATING
Gold, Silver, Lead and Copper Ores.
Furnaces for Roasting and Chloridizing Ores, for Amalgamation or Leaching.
Plans, Drawings and Estimates for Working Ores by any process.
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Mining Engineer,
Formerly Director of the Bureau of Statistics of the United States; Superintendent of the United States Special Commissioners of Mines; Member of the Committee on Mines at the Congress of Nations held in St. Petersburg, Russia; Mining Commissioner for the United States Monetary Commission; author of a History of the Precious Metals, etc.
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Montgomery Street, San Francisco.
☞ Reports, Surveys and Plans of Mines made. ☜

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.

FOR THE WEEK ENDING AUGUST 9TH, 1881.

245,337.—HEADER ATTACHMENT FOR HARVESTERS—F. R. Allen, Modesto, Cal.

245,341.—ROTARY HARROW—W. A. Bell, Adelaide, Cal.

245,436.—ACOUSTIC TELEPHONE—J. B. Bennett, San Louis Obispo, Cal.

245,344.—STEP LADDER—W. H. Bray, S. F.

245,273.—SWITCHING ATTACHMENT FOR STREET CARS—W. T. Browne, Stockton, Cal.

245,351.—VALVE MOTION AND GOVERNOR FOR ENGINES—Collins & Barrett, Vacaville, Cal.

245,352.—INSULATING WIRES—A. W. Cornwall, Black Diamond, Cal.

245,481.—BLIND FINISHING MACHINE—L. C. Graupner, Red Bluff, Cal.

245,305.—REIN HOLDER—W. P. Merrill, Florin, Cal.

245,556.—VEGETABLE PRESS—W. S. Plummer, San Jose, Cal.

245,403.—FLANGE CONNECTION—I. M. Scott, S. F.

245,320.—BOTTLE CORKER—Thos. Threlfall, S. F.

245,539.—DEVICE FOR RAISING WEIGHTS WITH JACK SCREWS—W. W. Vaughn, Stockton Cal.

245,583.—SAW—H. E. Van Bibber, Skagit, W. T.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

HARROW.—Morris Van Gelder and Frank Batchelor, Sacramento. Dated August 2, 1881. No. 245,033. The invention refers to certain improvements in that class of harrows on which curved or other forms of elastic teeth are secured to the harrow frame, either above, below, or at one side, so that their points will enter the ground and pulverize and cultivate it. It consists in the employment of a shoe or shoes, or projections, beneath the harrow frame, between it and the fastening clip, to which the teeth may be secured, so that while the teeth may be adjusted to enter the ground to any desired depth, the harrow frame will be prevented from dragging upon the surface of the ground. This attachment will be found of great advantage in protecting the harrow from wear, and in raising the frame from the ground so that it will not become clogged, while allowing the teeth to work to any desired length.

FOLDING SEATS.—George H. Fuller, S. F. Dated August 2, 1881. No. 245,153. This folding seat is of peculiar construction, difficult to describe without the aid of engravings. The whole seat when opened is very rigid, and is particularly adapted for use at halls, where it is often necessary to pack the seats into a smaller compass to clear the floor. The curve of the back and back legs, the front legs and the seat bottom correspond so nearly that when its parts are folded together, the front legs follows the curve of and rest upon the back legs, while the seat follows the curve of the back and lies between the front and rear legs; so that the whole device only occupies a space equal to the thickness of the legs.

ROTARY HARROW.—Wm. A. Bell, Adelaide, San Luis Obispo county, Cal. Dated August 9, 1881. No. 245,341. This invention relates to the class of rotary harrows, and more particularly to certain improvement in the balance and draft bars. It consists in rendering the draft bar adjustable and in necessary attachments to said draft bars, whereby its adjustment is effected. It further consists in an improved balance bar, its novelty consisting in its adjustability from one side of the harrow to the other, or at any point between to adapt the implement to all kinds of work.

VEHICLE SPRING.—George G. Buckland, Tulare. Dated August 2, 1881. No. 245,129. This invention relates to certain improvements in springs and running gear of vehicles, and it consists in a means of attaching the springs to the head-block and rear axle; also in a novel cross-frame, and a means for securing it to the springs, and in a support for the king-bolt. These improvements are intended to be used in connection with a patent granted to the same inventor on March 15, 1881, No. 238,847, and heretofore described in these columns.

STEP LADDER.—W. H. Bray, S. F. Dated Aug. 9, 1881. No. 245,344. The construction of this appliance enables the inventor to make a convenient and strong step ladder, and dispense with all side stays and braces, and to convert it from an ordinary single step ladder, into one having steps on both sides or into two separate ladders. This was described in full and illustrated in the MINING AND SCIENTIFIC PRESS of August 13, 1881.

A FRUE ore concentrator, with all the late improvements, and in perfect working order, is now kept by Adams & Carter, at the office of Hinckley, Spiers & Hayes, 220 Fremont street. The machine is ready to make tests, so that people who desire may try their ore upon it. There are 300 of these concentrators now in use on this coast.

Work on the Lick Observatory.

A reporter of the San Jose *Herald* lately visited Mt. Hamilton to see the progress of work in preperation for the construction of the Lick observatory. Upon the summit he found a level tract of about 10 acres, which had been cut down for the erection of the observatory and additional buildings. In some places the top had been cut down as much as 50 ft. Most of this work was done by the strongest blasting, as the summit is almost solid rock. The debris from the blasting was rolled over and graded up to extend the limits of the summit. When some of these large rocks would be loosened, they would roll down the side of the mountain, sometimes for a mile, cutting brush, trees and everything else in their path. The observatory and all the main buildings are to be built of brick. The brick is now being burned near the summit. Those supervising this matter have been very fortunate in finding the finest and best kind of clay for this purpose.

The water supply is from a natural spring about a mile north of the summit. The place is higher than the site of the observatory. The water is forced out by engines with great power and sent in great supplies to the place of work. It is pumped into four large tanks.

The buildings will be commenced early in September, and the work pushed forward as rapidly as possible until their completion. Prof. Burnham, the celebrated Eastern astronomer, who was here about a year ago, will return this fall, and study the heavenly bodies from Mt. Hamilton, as he says it is about the most favorable locality in the United States.

Fighting Adulterations.

The Empire State is taking the lead in efforts to stamp out the adulteration of foods, drugs, etc., and we trust the measures now adopted will prove adequate. Other States as well as New York have begun to do something to bring the anti-adulteration laws into force, and the outlook is hopeful for a commotion at least. Adulteration laws are harmless after they have been carefully embalmed in the statute books, with no especial inducement for anyone to prosecute under them, unless he is a pure philanthropist who enjoys pursuing evil on his own account, and at his own expense. In New York the matter has been placed in charge of the State Board of Health. Inspectors have been appointed to collect and analyze samples of butter, beer, baking powders, bakers' chemicals, cocoa, cordials, canned food, confections, cereals, cheese, meat extracts, fish and fish extracts, fruit essences, ether, gelatine, honey, ice cream, milk, molasses, lard oil, olive oil, quinine, sugar, syrups, soda water, spices, spirits, tea, wine, and also all pharmaceutical preparations. The object of this analysis is to carry into execution the law enacted by the Legislature at its last session, to prevent the adulteration of food and drugs. Judging from similar investigations already made in New York and other States, startling results can be looked for from these examinations. When this evidence has been gained, it is to be hoped that the pursuit of the adulterators will be unyielding.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

ETNA M. CO.—Aug. 15. Location: Nevada. Capital, $600,000. Directors—C. Borger, B. W. Mudge, J. L. Sanford, Daniel Buck, W. Aug. Knapp.

MEDORA M. CO.—Aug. 15. Location: Nevada. Capital, $10,000,000. Directors—Thomas H. Caswell, Joseph Warburton, J. Landers, Hiram Crowell, Henry K. Mitchell.

SIERRA LAND AND IMPROVEMENT CO.—Aug. 15. Location: California. Capital, $500,000. Directors—A. J. Rhodes, Roswell Lee, Crowson Smith, J. B. Emery, S. M. Miller, M. A. Wheaton and Daniel Buck.

VAST EXPLORING EXPEDITION.—The Northern Pacific railroad company and the Oregon railway and navigation company have united in putting a scientific exploring expedition in the field, for the purpose of examining into the mineral, agricultural and other resources of the territory tributary to the two companies between Lake Superior and the Pacific coast. Prof. Raphael Pumphelly, until now in charge of the coal and iron department of the last national census, has been appointed chief of the vast field of operations, which will be explored by separate parties under the chief direction of Prof. Pumphelly. The latter has already started for Montana, for the examination of the principal mining districts in that territory. The task of the expedition will extend through several years.

THE Russian Minister of the Interior is considering measures for preventing the productive power of the people being improperly turned to account by speculators. It is intended to establish official control over all the Russian grain markets, and over the exports from Odessa, so as to lower the price of grain in the Empire of Russia.

THE San Diego *News* says: The disease so destructive to cattle, and particularly to calves, originated, so far as is known here, at Tecate and Potrero, the first in Lower California, and the last in California. It is destructive at Laguna and has gone into Pine valley where it is doing its work.

News in Brief.

THE Monterey Whaling Company will begin operations on the 1st of September.

WAGON loads of immigrants from Missouri and Kansas are daily arriving in Baker City, Or.

A NEW town has been established above Lovelock's, Butte county, and is named Junction.

THE Carson Mint will not start before the 1st of October. They are busy building the new refinery.

AN Atlante (Ga.) dispatch says the General Assembly has defeated the Temperance bill—20 to 19.

CLAUS SPRECKLES of San Francisco purchased a large herd of mules near Chico for shipment to the Sandwich Islands.

BEFORE snow comes, says the *Republican*, Truckee will again be on its feet, so to speak, and pursue even the tenor of its way.

LARGE numbers of Indians are in the Mogollon mountains, Arizona, and the timber is afire in all directions. The grass is all burnt and cattle are in a bad fix.

AN unsuccessful attempt was made to wreck an excursion train having on board 550 men, women and children, by laying ties across the track near San Antonio, Texas.

AN American missionary, after an interview with General Ignatieff, Minister of the Interior, obtained from him an order directing the authorities of the Caucasus to grant him facilities for pursuing his labors.

ABOVE 10,000 troops have signified their intention to be present at the Yorktown celebration. It is believed that the militia alone to take part in the celebration will exceed 30,000. Many States will send full regiments.

IT is reported that the Vatican insists upon the abolition of the tribunal for a trial of ecclesiastical cases, as a preliminary condition of yielding upon the question of notifying the Prussian government of clerical appointments hereafter.

THE Bannock and Shoshone Indians have consented to provide for the occupation by the Utah and Northern Railroad Company of a strip of land across their reservation, amounting in the aggregate to 772 acres. For this the Indians receive $6,000.

AT Yaquina bay the railway is laid, and cars built, and they will commence next week to lay stone on the breakwater. The large wharf has been thoroughly stanchioned and braced, previous to landing the rock. There is about $9,000 yet to be expended.

AT Tom Hughes' Colony at Rugby, Tenn., two deaths occurred on Saturday, and there are 20 well-defined cases of typhoid fever from bad drainage and water. The settlement has a population of 400. A corps of doctors and nurses have been forwarded.

THE Division Superintendents of the United States Railway Service met in Washington recently, to discuss the question of providing some method for heating postal cars in winter that will not endanger the burning of the car in case of accident to the train.

JACOB BLINN and Jacob Rich, two old Shasta county pioneers, have resided and been partners on Long gulch for the last 27 years. Last Monday Blinn committed suicide by shooting himself with a rifle. He was about 56 years old, and his partner was past 73.

SOUTHERN Arizona exchanges are filled with accounts of floods that have done great damage to mills, dams, crops, etc. Every river was up, and old-time dry places were brimful of water. One train was 72 hours making its way from Yuma to Tucson, less than 300 miles.

FORTY miles of the main line of the Canadian-Pacific is completed west of Portage la Prairie. The grading on the whole line between Winnipeg and Portage is in progress. Track-laying has been commenced, and the road is expected to be ready for traffic by November.

IN Placer county, during the foothill fires of last week, Mrs. W. M. Foster, who is entirely blind, asked her son Willie, six or seven years old, to lead her up to her father's for safety. On reaching there the little boy went to the spring for a drink, fell in and was drowned.

NAVIGATION on the upper San Joaquin, above San Joaquin City, is now impracticable on account of the low stage of water. A large amount of wheat, estimated at 800,000 sacks, has been brought out by the steamers, although it has been estimated that fully one-half of the present crop will have to be stored until the water again rises.

SPEAKING of the Nevada and Oregon Railroad, the Reno *Gazette* says: The Plumas county branch will strike through Beckworth pass and across Sierra valley, the most productive region in Eastern California. It will run through a good country all the way to Quincy. It is about equally divided between agriculture and mining, and will give a large freight and passenger business to the road.

THE Benton, Montana, *Record* says: It has recently come to light that some 17 Nez Perces were massacred by the Sioux, under Sitting Bull, in the north, a month or six weeks ago. It will be remembered that after the surrender of the Nez Perces to Gen. Miles in the Bear Paw mountains, in 1877, that a fragment of the band escaped, fled across the boundary line and associated themselves with Sitting Bull's band. These massacred Nez Perces were the remnant of those fugitives.

Mining and Scientific Press.

THE MINING AND SCIENTIFIC PRESS is the leading mining journal in America, and enjoys a larger circulation among the more intelligent operators and workers in the gold fields of the world.

Established in 1860, it has firmly maintained its position as a reliable, standard journal. The information given in its columns has saved millions of dollars to the practical miners, metallurgists, millman, mine and shareholders on the Western side of our continent.

Among its contributors are the ablest and most experienced mining engineers, superintendents and practical miners in this country.

The PRESS gives a condensed summary of Mining Summary from the most important mining districts of the country.

New processes and methods of mining are described in weekly issues. New mining machinery and improvements are frequently illustrated and explained in a manner to be of great value to all interested in mining.

As a scientific and mechanical representative of the Pacific coast it is decidedly popular, and a standard journal with the most thrifty industrial people of the Pacific States and Territories. Its authority is of the highest order, and its usefulness in its special sphere unrivalled.

Every public library, mining engineer, metallurgist, mining operator and intelligent mechanic and manufacturer, will find profit by its reading.

Subscription, $4 a year in advance. Sample copies, postpaid, 10 cents.

DEWEY & CO., Publishers.
No. 202 Sansome St., San Francisco, Cal.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. F. OSBORNE—San Francisco.
G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—San Mateo and Santa Clara counties.
C. E. WETMORE—Alameda county.

Attend to This.

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Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F.D., at this office.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We will send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavillon has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francisco.

THE State Mining Bureau, No. 313 Pine street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

ANNUAL STATISTICIAN of 1881.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 316 California st. Price, $4.

COPP'S "U. S. MINERAL LANDS, LAWS, FORMS, INSTRUCTIONS AND DECISIONS."—1881. 570 pp. In full law binding, $4.50; half law binding, $3, at this office.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending August 16, 1881.

HIGHEST AND LOWEST BAROMETER.

Aug. 10	Aug. 11	Aug. 12	Aug. 13	Aug. 14	Aug. 15	Aug. 16
29.878	29.854	29.925	29.893	29.881	29.916	29.999
29.784	29.785	29.849	29.824	29.819	29.831	29.886

MAXIMUM AND MINIMUM THERMOMETER.

70	53	63	66	66	63	62
53	54	53	53	53	52	53.5

MEAN DAILY HUMIDITY.

72.3	84.7	84	76.3	72.3	79	1.3

PREVAILING WIND.

W	W	SW	W	W	W	W

WIND—MILES TRAVELED.

270	293	233	350	257	324	

STATE OF WEATHER.

Clear.	Fair.	Foggy.	Fair.	Clear.	Clear.	

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1881. —— inches.

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, August 17, 3 P. M.

SILVER, ½.

GOLD BARS, 890@910. SILVER BARS, 10@18 ₰ t. count.

EXCHANGE on New York, par; London, 49½@49¾; Paris, 5.20 francs ₰ dollar; Mexican dollars, 90@91.

NEW YORK (4 per cent), 116.

San Francisco Metal Market.

[WHOLESALE.

WEDNESDAY, August 17, 1881.

IRON.—		
American, Pig, soft, ton	— @	30 00
Scotch, Pig, ton	— @	25 00
American White Pig, ton	— @	—
Oregon Pig, ton	— @	36 00
Clipper Gap, White	— @	26 00
Clipper Gap Car Wheel	— @	35 00
Refined Bar	4½ @	8
Horse Shoes, keg	7 00 @	8 00
Nail Rod	— @	9½
Norway, according to thickness	8½ @	9½
STEEL.—		
English Cast, B	16 @	18
Black Diamond, ordinary sizes	13 @	15
Drill	15 @	18
Flat Bar	— @	16
Plow Steel	15 @	16
COPPER.—		
Ingot	— @	52
Sheet	— @	20
Sheating, Tinned 14x18	— @	42
Nails	— @	—
Bolts	38 @	42
Old	— @	18
Bar	— @	22
Cement, 100 fine	— @	15½
LEAD.—		
Pig	@	4½
Bar	@	6
Pipe	— @	8
Sheet	— @	9
Shot, discount 10% on 500 Bags		
Drop, per bag	@	2 10
Buck, "	@	2 30
Chilled "	@	2 50
TIN PLATES.—		
10x14 I C Charcoal	— @	7 50
10x14 I C Coke	6 00 @	6 25
Banca Tin	— @	25 00
Australian	— @	22 00
I. C. Charcoal Roofing 14x20	— @	7 25
" " " 20x28	20 00 @	21 00
ZINC.—		
By the Cask	— @	9
Zinc, sheet 7x3 ft. 7 to 10 lb. less the cask	— @	10
NAILS.—		
Assorted Sizes	3 50 @	3 75

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

REGULAR DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

SAN FRANCISCO, AUGUST 10, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, a Dividend (No. 50), of Fifty (50) Cents per share was declared, payable on Monday, August fifteenth (15), 1881. Transfer books closed on Thursday, August eleventh (11), 1881, at 3 o'clock P. M.

WM. WILLIS, Sec'y.

Office—Room No. 29, Nevada Block, No. 300 Montgomery street, San Francisco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

SAN FRANCISCO, AUGUST 10, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, an Extra Dividend (No 51), of Twenty-five (25) Cents per share was declared, payable on Monday, August fifteenth (15), 1881. Transfer books closed on Thursday, August eleventh (11), 1881, at 3 o'clock P. M.

WM. WILLIS, Sec'y.

Office—Room No. 29, Nevada Block, No. 300 Montgomery street, San Francisco, Cal.

Steep Hollow Gold Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Liberty Hill Mining District, Nevada County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 6) levied on the 21st day of June, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. shares.	Amt.
Jos. Clark	3	50	$75 00
E. A. Richardson, Trustee	25	100	150 00
E. A. Richardson, Trustee	26	100	150 00
E. A. Richardson, Trustee	27	50	75 00
E. E. Dewey, Trustee	50	500	750 00
J. W. Pew, Trustee	55	2250	3375 00

And in accordance with law, and an order of the Board of Directors, made on the 21st day of June, 1881, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the auction rooms of Jno. Middleton & Son, No. 116 Montgomery street, San Francisco, California, on Thursday, the 18th day of August, 1881, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

J. W. PEW, Secretary.

Office, 310 Pine street, room 15, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Company,

Nevada Block, Room 37, San Francisco, Aug. 15, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 70) of Fifty (50) Cents per share was declared, payable on Saturday, August Twenty-seventh (27), 1881. Transfer books closed until the Twenty-ninth (29) inst.

W. W. TRAYLOR, Sec'y.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending this date, the Board of Directors of The German Savings and Loan Society has declared a dividend on Term Deposits at the rate of five and one-tenth (5 1-10) per cent per annum, and on ordinary Deposits at the rate of four and one-fourth (4¼) per cent. per annum, free from Federal Taxes, and payable on and after the 11th day July, 1881. By order, GEO. LETTE, Secretary.

San Francisco, June 30, 1881.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company,

SAN FRANCISCO, AUGUST 9, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend, number twenty (20), of twenty-five (25) Cents per share was declared, payable on Monday, August fifteenth (15), 1881, at the office of the Company, Room 19, No. 328 Montgomery street, San Francisco, California. Transfer books closed on August tenth (10), 1881, at 3 P. M.

JOSEPH NASH, Sec'y.

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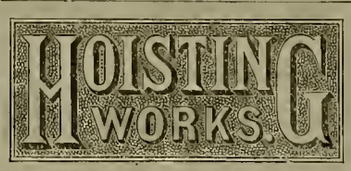

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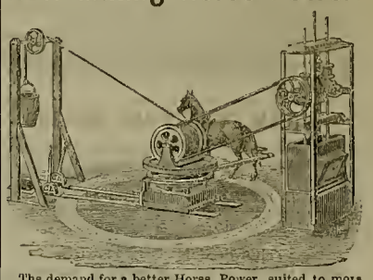

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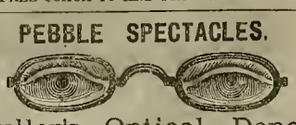

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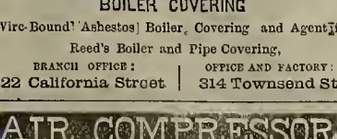

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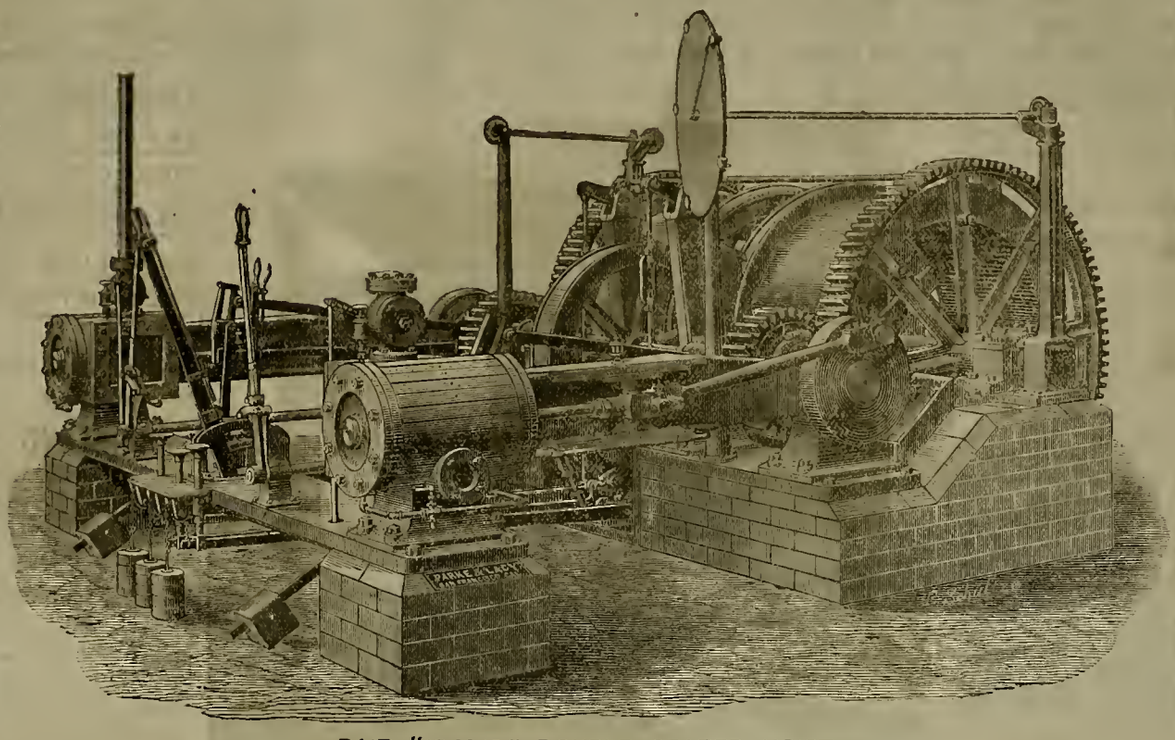

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This is no NEW PATENT NON-EXPLOSIVE SAFETY POWDER, but the GENUINE STANDARD ARTICLE, and as safe to use and handle as any Nitro-Glycerine Powder manufactured. The Fumes and Gases, common in other Nitro-Glycerine Powders, are almost destroyed, and do not leave the miner with headache or nausea. Among the numerous recent testimonials the following is but a fair sample, constantly received, attesting the superiority of EXCELSIOR POWDER:

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E. W. ROBERTS, Superintendent.

Give this Powder a trial and you will use no other. For Strength and freedom from noxious fumes, it has no equal. Address all orders to EXCELSIOR POWDER CO., No. 330 Pine Street, Rooms 53 and 54, Academy Building, San Francisco, Cal.

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"THE $1,000 CHALLENGE"

Ore Feeder for Quartz Mills.

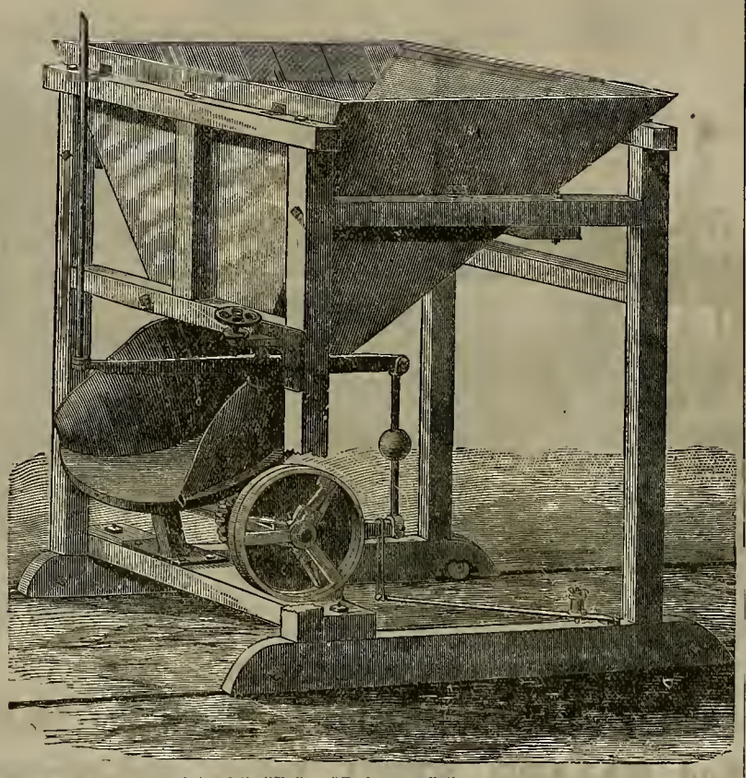
OVER 800 ARE NOW IN USE, GIVING ENTIRE SATISFACTION.

Awarded First Premium at the Tenth and Twelfth Induetrial Faire of the Mechanics' Institute.

Twenty Per Cent. More Ore Crushed with Fifteen Per Cent. Less Wear of Iron than by Hand Feeding.

The accompanying cut illustrates the recently introduced Grip, and also the Spring Attachment, which replaces the Weight heretofore used, and which are obvious improvements.

It is now fully demonstrated, after careful and long continued experimentation and practical use, that the plan upon which a perfect Ore Feeder must be constructed is that of a carrier, and not that of a shaking-table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Jerky or spasmodic contrivances will not answer the purpose for wet or sticky ores.



The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20	Stamp	Tuolumne county,	Cal.
Sheep-Ranch	20	"	Calaveras "	"
Mahoney	40	"	Amador "	"
Zeile	40	"	" "	"
Placerville	40	"	El Dorado "	"
Gross	80	"	" "	"
Julian	20	"	Placer "	"
St. Patrick	15	"	" "	"
Providence	20	"	Nevada "	"
Omaha	10	"	" "	"
Green Mountain	60	"	Plumas "	"
Plumas-Eureka	60	"	" "	"
Bulwer-Standard	30	"	Bodie Dis., Mono,	"
Standard	20	"	" "	"
Noonday	30	"	" "	"
Bodie	10	"	" "	"
Christy	5	"	Uintah Co., Utah.	
Ontario	40	"	Parley's Park,	"
Contention	20	"	Tombstone Dis, Arizona	
Grand Central	20	"	" "	
Harshaw	20	"	Patagonia,	
Sunshine	20	"	Idaho Springs, Col.	
Homestake	200	"	Black Hills, Dakota.	
Father De Smet	80	"	" "	
Hidden Treasure	40	"	" "	

Superiority of the "Challenge" Ore Feeder Demonstrated!

At the "Christy" Mill, Uintah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "Eclipse."

The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted.

The "Silver King," Mill of Arizona, also removed the "Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill, of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.

Mr. H. W. GREENWELL, of the Tingman Mine, El Dorado Co., or any other person can make $1,000 by disproving the acknowledged superiority of my "CHALLENGE" Feeder, in a competitive trial, side by side, with any other Feeder, on wet or sticky ores from any mine, and I will give $100 to any one who will procure the acceptance of this challenge, and arrange for a fair and impartial test on merit.

I mean business, Gentlemen, "either put up or shut up."

JOSHUA HENDY,

Manufacturer of all descriptions of Quartz and Saw Mill Machinery. A Large Stock of both New and Second Hand at Machine Worke. Noe. 49 and 51 Fremont Street, San Francieco.

Agent for "BAKERS" Rotary Pressure Blowers.

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THE BALDWIN STEAM MOTOR for use on City and Suburban Roads.

FREIGHT CARS, PASSENGER CARS, STREET CARS, } From BILLEMEYER & SMALL CO., and J. M. JONES & CO.

CAR WHEELS. from A. Whitney & Sons.

RAILROAD IRON, SPIKES, BOLTS, Etc. } FROM BEST EASTERN MAKERS.

WILLIAMS, DIMOND & CO.

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The springs are situated at an altitude of 1,700 feet above sea level; and for natural beauty of scenery, healthful climate, hunting and fishing, are unsurpassed in the State. The surrounding forests and valley are particularly inviting to campers, who will be especially entertained at the Springs.

The waters have produced many wonderful cures in the following diseases: Dyspepsia, Paralysis, Erysipelas, Rheumatism, Sciatica, Liver and Kidney, Bronchitis, Pulmonary Complaints, in their early stages General Debility, and a never-failing remedy for Chills and Fever.

For further particulars, address

MRS. J. C. COODS, Highland Springs.

MINES WANTED.

Wanted for foreign account, two or three GOOD MINING PROPERTIES, in either Arizona, New Mexico or California. Also one California Dividend Paying Mine for New York account. Favorable report of expert essential.

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Dewey & Co., 202 San [illegible] St. **Patent Att'ys**

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Nos. 811 to 819 North Second Street.

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MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS.

Noe. ONE, TWO and THREE.

Stronger, Better and Safer than any other High Explosive

Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. Triple Force Caps and all Grades of Fuse.

BANDMANN, NIELSEN & CO.,

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MUSICAL BOXES

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ACTS DIRECTLY upon the great nervous and organic centres, and *cures by a natural process of reinvitalization.*

HAS EFFECTED REMARKABLE CURES, which are attracting wide attention.

HAS BEEN USED BY Rt. Rev. John J. Keane, Bishop of Richmond, Va., Hon. Wm. D. Kelley, T. S. Arthur, and others, who have been largely benefited, and to whom we refer *by permission.*

IS STRONGLY ENDORSED: "We have the most unequivocal testimony to its curative power from many persons of high character and intelligence."—*Lutheran Observer.* "The cures which have been obtained by this new treatment seem more like miracles than cases of natural healing."—*Arthur's Home Magazine.* "There is no doubt as to the genuineness and positive results of this treatment."—*Boston Journal of Commerce.*

THE OXYGEN HOME TREATMENT contains two months' supply, with inhaling apparatus and full directions for use.

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All orders directed to H. E. MATHEWS, 606 Montgomery street, San Francisco, Cal., will be filled on the same terms on which we fill orders sent directly to our office in Philadelphia.

Patients ordering from our depository in San Francisco, should, at the same time, write to us, and give a statement of their case, in order that we may send such advice and direction in the use of the Treatment as their special disease may seem to require.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, AUGUST 27, 1881.

VOLUME XLIII Number 9

Pan Amalgamation.

To promote amalgamation it is the general custom to add to the charge in silver mills, either at or soon after the beginning of the grinding, or at the time of supplying the quicksilver, various materials generally described as "chemicals," and usually consisting at present of sulphate of copper and salt.

Since the first introduction of the pan process a great variety of substances supposed to effect the decomposition of the silver sulphurets and to facilitate amalgamation, have been suggested by what J. D. Hague calls "process vendors," and employed by men possessing little or no knowledge of the science of chemistry. Even tobacco juice, decoction of sego brush, and various other equally absurd ingredients are said to have been used by some operators in the earlier days of the Comstock, and believed to be effective reagents in the decomposition of the ore and amalgamation of the silver. We can easily see how this could be done, remembering that even at this late day things equally absurd are practiced; and the same absurdities repeated time and time again.

The long list of materials in use has now been reduced, excepting in a few places, to sulphate of copper and salt. The quantity used varies from a quarter or half a pound to three or four pounds to each charge of ore, the two substances being employed in very variable proportions in different mills. The action of these, however, which is generally supposed to be analogous to that produced by the same reagents on the Mexican patio process, is not very clearly understood. This is apparent from the fact that in some mills, both the sulphate of copper and salt are used; in others, only the first is used without the second; and in others, only second without the first, or, if at all, in proportions so minute, that its efficient action is incredible; others dispensed with the use of "chemicals" altogether; and under all these varying results, about the same average results have been obtained.

Mr. Hague, who investigated this subject pretty thoroughly, made the statement some years since, that some mills accustomed to use both salt and sulphate of copper, dropped either one or the other while working on the same class of ore without perceiving any difference in the result.

The mining town of Jesus Maria is situated in the State of Chihuahua, Mexico, in the very heart of the Sierra Madre mountains, distant about 300 miles due east of the port of Guaymas, 200 miles northeast of the city of Alamos, State of Sonora, and 300 miles westerly of the city of Chihuahua. It contained at one time 14,000 inhabitants, whose sole occupation was mining. Fourteen years ago the town was destroyed by fire, and up to within the past year but little was done to rebuild it, as but few of the inhabitants have been able to recover from the effects of that calamity. At present there are about 1,500 inhabitants, and the population is increasing, as English and American capital are erecting extensive works, and in a very few months Jesus Maria will again be yielding its treasures of gold and silver as of old. The mineral belt is large, and within a radius of 15 miles of the town the records show 550 locations or mining claims, all of which have been worked more or less extensively for the last 35 years. Over a dozen mines have yielded immense bonanzas from surface down. The Santa Julian mine yielded $52,000,000, the work being done in the crudest manner and under the greatest disadvantages.

Some bars of silver bullion, sent by Wells, Fargo & Co's. express, were unloaded from the stage at the depot at Benson, Arizona, the other evening, and while the messenger was taking them from the platform into the office, being absent but a few seconds at a time, some person or persons got away with one of the bars, valued at $2,000, and which must have weighed at least 125 lbs., and no trace of it has been discovered.

Railroad building is difficult and costly in the Temecula canyon, San Diego. The *Union* says: The roadbed is located from 4 to 25 ft. above the creek, and in a few places the grade

THE VICTOR ROCK DRILL

is very heavy—145 ft. to the mile—which will necessitate the assistance of an extra locomotive. Much of the way the roadbed is to be formed

WILBRAHAM ROTARY PUMP WITH ENGINE.

by just enough cutting on one side to make the fills. Estimates were given us from which we infer that about one-fourth of the rock which is to make the roadbed must be removed by blasting. Some idea of the cost of construction of this seven miles may be had when we say it is estimated that it will require $80,000 worth of powder to do the necessary blasting, and we think $45,000 a mile, a very low estimate for this portion of the work.

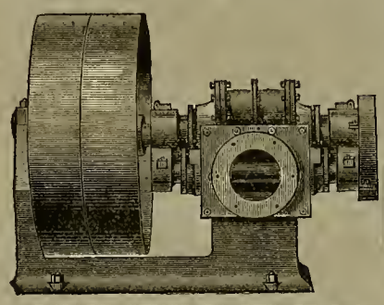
The Humboldt (Nevada) sulphur works ship 180 tons of sulphur a month.

Victor Rock Drill.

Parke & Lacy have at their mining machinery depot, Fremont St., one of the Victor rock drills set up for trial. This rock drill we illustrate on this page.

This machine is so simple in its construction that by a few minutes' observation, any person may fully understand how to operate it. It has all the adjustability required to adapt it to uneven surfaces and can be operated upon a space 16 inches square.

The double gauge bit which is used with this machine is superior to the ordinary single bit. It is less liable to break. It always bores round, straight smooth holes. In consequence of the peculiar shape of this novel bit, any size hole



ROTARY PUMPS TO RUN BY BELT.

can be drilled with one and the same machine, from half an inch up to six inches in diameter, and any bit from one and a half inches in diameter will drill holes from 1 to 10 ft. in depth without requiring any change of bits. This machine is self-feeding and self-cleaning. It is run either by hand or steam, as persons may desire. It weighs 350 lbs., and can readily be moved by one person in less than one minute, by laying it down and running it upon its own wheels, like a cart from place to place in a quarry. This machine has recently been greatly simplified, improved and strengthened. It is made of the best cast steel and iron. The engraving is so plain that anyone can see how the drill is operated.

The Wilbraham Rotary Pumps.

We illustrate on this page the Wilbraham rotary piston pump, one of which is exhibited in the fair by Joshua Hendy, agent for this coast. The pump is made on the same general principle as the well-known Baker blower, and it is claimed that the ordinary objections to this class of pumps have been overcome in this. The pumps work equally well run in either way. It will pump hot or cold liquids, delivering a steady and uniform stream, and works under either high or low pressure. It is positive in its action in both lifting and forcing. It has no irregular shape or sliding movements, all working parts being true circles. The larger engraving shows the pump with engine attached. The smaller one shows it arranged to run by belt. This pump has only lately been introduced on this coast, though well known in the East.

Foundry Notes.

The Fulton foundry (Hinckley, Spiers and Hayes), is in common with most of the other large iron works of the city, very busy just now. They are making a specialty of the Corliss engine, of which pattern they are making quite a number. They have just completed a large 400 horse-power engine for the Pioneer Woolen Mills of this city. This is a Corliss cut-off, with cylinder 30-inch bore, and 60-inch stroke. It works perfectly. On the trial, the first day it ran, there was only a difference of half a revolution a minute when running without a load, or with all the ponderous machinery of the mill, suddenly started. This remarkable performance shows the perfection of the mechanism both in design and construction, and the builders are to be congratulated on the result.

Another one of these engines, with cylinder 18-inch bore by 48-inch stroke, has just been completed for the American Sugar Refinery of this city. They have nearly completed two of these engines, each 18-inch bore by 36-inch stroke, for the Presidio Railroad Co., the new cable road.

Some little marine work is also being done. They have just completed a little iron steamer for Ecuador, 49 ft. long, 12 ft. beam and 8 ft. deep. She is to run on a river there to transport gum for private parties. The boiler is horizontal, and the engine is a 10x12 high pressure. Have also completed two double engines, 10x12, and boiler, for the Health Officer's new steam launch, *Geo. C. Perkins*. Are now putting into a new freighting schooner auxiliary steam power. Among other jobs now in the shop is a 150-horse power engine, Myers' cut-off, for a mine in Montana; a 10-stamp mill with pans, settlers, retorts, etc., for the Bradshaw Co., Tombstone, Arizona; three sets of boisting works for as many different mines; five air compressors, etc. They are also doing a good deal of repair work on the iron steamer *Barnard Castle*, now in the dry dock.

An excellent sample of the work of this firm may be seen in the fine engine which supplies the power for all the machinery in the fair building. It has been in use several years, and has performed its duties very satisfactorily in every way.

At the Ætna Iron Works they have just turned out a 40 stamp mill, two furnaces and dryers for the Highland Chief mine, Lewis district, Nevada. The firm has in process of manufacture three O'Hara furnaces, a 12x24 engine and boiler for Knox's woolen mill, Fifth street, a ten-stamp mill, to be provided with furnaces and everything necessary, and to be set up in running order at the Tahoma mine, Atlanta, Idaho. The owners of the Tahoma are Pennsylvania capitalists. Then there is a large lot of 12-ft. pulleys and 10-inch shafting in process of manufacture for Beckett & McDowell, of New York. The Ætna people have lately sent a 40-stamp mill to the Providence mine, Nevada City.

The ore streak found in the south header of Sutro tunnel, in Yellow Jacket ground has been prospected a distance of 15 ft. from the drift. It maintains its width, and is said to have a better appearance. No assays have been taken since it was found. The foregoing we take from the Virginia *Chronicle*. There is a conflict of testimony somewhere. One of the Comstock papers recently stated that the ore was sulphuret in true Cometock quartz, assaying from a trace up to $300 per ton.

The New District.—The excitement at Palisade over the mining discovery in that neighborhood is unabated. A private letter from the Eureka *Sentinel* that Howland & O'Brien purchased a half interest in the Onondago for $50,000. It has been published that they merely bonded it. A number of strangers and experts went out to the mines, seeking locations. The new camp seems to be attracting a great deal of attention.

Tearing down the old smelting works at the Geddes & Bertrand mine, Eureka, Nev., has been commenced, to make room for the 40-stamp mill to be immediately erected.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

San Diego Mines.

Editors Press:—I have besn down the coast to San Disgo county hunting mines for a party, and stopped two weeks in the Pinacarte district, 30 miles south of hsre. I found some small mines, owned chiefly by Mexicans. Arastras are used extensively. One mine, whicb was divided and the north end sold to John Larocbe, called the San Jacinto, is now down 107 ft. The decomposed white quartz pays from $30 to $100 per ton. Thsy are now working a vertical shaft near the junction with the otber mins on the same lode. Thsy will soon put up a five-stamp mill with 600-lbs. stamps, pan and 20 horss-power engine. The gold is exceedingly fine, and nothing would work it hettsr than Paul's pan.

There is every prospect of the Julian mines starting up again. The Providence Mountain mine, located hy Andrew Macfarlane, and which he sold to a mercbant of this town and to Ahern & Co. some time ago for $300, has now men at work on it. Ths Waterman mine, in Mohave, is a fine property, and hig pricss have been offsred for it.

The district is evidently way up for miners. Mr. Waterman believes he has a mine now. His brothsr is huilding for him a mill, which was formerly owned hy the Miueatta Belle, of Panamint valley.

A party are going out on a general tour for miners to prospect towards the Colorado. Look out for big strikes. When I return from the trip, I will let you know the result as well as a practical opinion of snch properties as I may see on my rounds. Old Prospector.

San Bernardino, Aug. 11, 1881.

First Gold in California.

General Sherman has given this account of the first discovery of gold in California: "I remember one day that two men, Americans, came into the office and inquired for the Governor. I asked their husiness, and one answered that they had just come down from Captain Sutter on special business, and they wanted to see Governor Mason in person. I took them into the Colonel, and left them together. After some time the Colonel came to his door and called me. I went in, and my attention was directed to a series of papers unfolded on the tahle, on which lay ahout half an ounce of placer gold. Mason said to me, "What is that?" I touched it and asked, "Is it gold?" Mason asked me if I had ever seen native gold. I answercd that in 1844 I was in Upper Georgia, and there saw some native gold, hut that it was much finer than this, and that it was in phials or transparent quills; but I said if this were gold it could be easily tested—first by its malleahility, and next hy acids. I took a piece in my teeth, and the metallic luster was perfect. I then called to the clerk (Baden) to bring an axe and hatchet from the hack yard. When they were brought, I took the largest piece and heat it flat, and beyond donht it was metal, and a pure metal. Still, we attached no importance to the fact, for gold was known to exist at San Fernando and yet was not considered of mnch importance."—*Ex.*

New Mill at Sawtooth.

The Wood River *Times* says: Mr. Cortright, Secretary of the Colnmhia, Beaver, and Lncky Boy mining companies, of Sawtooth, spent fonr days in Hailey last week, endeavoring to secure 35 or 40 carpenters to work on the two mills which are being erected over the range for the companies named. About 80 men were at work already, hut Mr. Cortright said that his companies wanted to crowd two seasons work into one, if possible.

The quartz mill and appurtenances are intended for 20 stamps, working abont 60 tons of ore per day. Only 10 stamps were ordered, however, as the mine managers preferred to go a little slow this year. But more ore having been struck recently, it was deemed hest to make the contemplated addition to the capacity of the mill at once, and Mr. Brewster, President of the three companies named, left for San Francisco last Friday to proonre tbe other ten stamps. They will probahly he shipped within 30 days, and be in position hy the 10th of October. The mill was mannfactured at the Pacific Iron Works, in San Francisco, and James E. Owsns, who is said to he the hest constructing engineer on the coast, will superintend its erection. It will be started up on ore assaying from $35 to $65 in gold and ahont $600 in silver. It is expected that hy the first of Octoher tbe earnings will admit of the first monthly dividend being declared.

The grading of the experimental mile of the Grangeville and Antioch road has heen commenced from Hanford. The first furrow was plowed hy J. A. Hill, who sowed the first wheat in the Mussel Slough conntry.

The Harbor at Wilmington presents a lively appearance. There are 14 vessels either lying in the harbor or anchored outside.

Subterranean Heat.

Statistice of Interest to Scientiete.

Following are the temperatures of the ground in the Forman shaft, from the surfacs to the depth of 2,100 ft., as ascertained by drilling holes not less than three ft. dsep into the rock, and inserting a Negretti & Zambra slow-acting thermometsr (of the pattern adopted hy the Undsrground Temperature Committee of ths British Association, and standardized at Kent) into the hols, closing the hole with clay and lsaving the thermometer for 12 hours—not less than three holes being tried at each point:

Depth.	Temperature.
100 feet	50½ degrees.
200 "	55 "
300 "	62 "
400 "	60 "
500 "	68 "
600 "	71½ "
700 "	74½ "
800 "	76½ "
900 "	78 "
1,000 "	81½ "
1,100 "	84 "
1,200 "	89½ "
1,300 "	91½ "
1,400 "	96½ "
1,500 "	101 "
1,600 "	103 "
1,700 "	104½ "
1,800 "	105½ "
1,900 "	106 "
2,000 "	111 "
2,100 "	119½ "

It will he sesu by tbe ahove that, although there is on the whole a steady increase of temperature as depth is attained, the increase of temperature is not rsgular. For instance, the rock at the 400 is two degrees cooler than at the 300 level; between the 400 and 500 levels there is a diffsrsnce of eight degrees, whils in other places an additional depth of 100 ft. shows hut a slight increase in the temperatnre. Thus at the 1800 level the temperature is 105½ degrees, while at the 1900 it is hut 106 degrees, an increase of hnt one-half a degree. This difference is undoubtedly owing to the character of the rock at the points whsre the holes were made; therefore, it would he of great interest to have, in connection with the temperature, a description of the rock; not only the kind of rock, hut also the nature of the same, whether carrying much lime, gypsum or iron pyrites. It would prohahly he shown that wbere tbere was mucb lime there wonld he an inoresse of heat not warranted hy the incressed depth, and the revesse where lime was absent.—*Virginia Enterprise.*

Educating the Indians.

We had this week, an opportunity of conversing with Mr. E. Conklin, who lately arrived in this city from New Mexico, on his way East again. Mr. Conklin has heen very sncessful in his mission among the Indians, getting the full quota to take to the Government schools at Hampton, Virginia, and Carlyle, Pennsylvania.

It will he rememhered that during President Grant's administration the different Indian Territories were divided np among the religious denominations, in the matter of Indian affairs. New Mexico and Arizoua fell to the Presbyterian chnrch, and the Rev. Sheldon Jackson, D. D., is Snperintendent of Missions for the Pacific coast for that denomination.

Early last fall the Government commissioned Dr. Jackson to proceed to New Mexico and Arizona to collect a certain numher of Indians for the purpose of taking them on to the Government schools referred to. Dr. Jackson, knowing of Mr. Conklin's familiarity with and knowledge of Indian affairs, called upon him to assist in the task. He took Arizona for his field, and to Mr. Conklin was assigned New Mexico. A brief account of the method of procedure as ohtained from Mr. Conklin will be of interest.

He proceeded, with letters from the Government to the different agencies, and visited tbe different puehlos holding treaties with the nnmerous trihes of New Mexico.

The combined result of the efforts of these two gentlemen was that more Indians were collected than the commission called for, which was very rare, and a flattering circumstance for these two gentleman. Twenty-six only were taken East, several heing left hehind.

In visiting the puehlos some appreciate the advantages to he gained hy going, but will not go nevertheless. Some can see no advantage in education. Others again, who see the henefit, would like to go, bnt the ties of kinship are stronger than the desire for knowledge. It sometimes happens also that those who make up their minds to go are not allowed to do so hy their relations.

There is, of course, nothing compulsory in this matter, and the couditions nnder which the Government will take the Indians is always carefnlly explained to them. They then hold a sort of council or cancus to consider the advisahility of letting any of the trihe go. Some of the chiefs, however, are so opposed to treating with the Government that they will not even permit a council to be called. In some pnehlos they will he pleased and agreeahle, which in others they will have nothing whatever to say or do with any Government official. One great trouble Mr. Conklin found was his necessity of refusing a great nnmher from any one trihe. That is, two or three wonld signify a willingness to go, and then a dozen more would want to. They heing denied, the first ones would decline, nnless all went. In consequence, none would go from this tribe.

Among tbese Puehlo Indians, altbough they are all the same, each tribe spsaks a diffsrsnt language. In one locality Mr. Conklin found in 75 miles, five Pueblos, the Indians of no one of which could understand those of the otbers. This is between Albuqnerqne and Santa Fe. The languags vary all over ths Territory. In nne of the carloads taken none of the Indians nnderstood each othsr at all.

These Indians are taken to he schooled for three years and tben returned to their peopls again, the whole, of course, at tbe cost of the Govsrnment. They are now huilding a large school-house in connsction with this system, which will he for girls especially. It will, thsrefore, he feasihle to bring more Indians in the future.

Mr. Conklin has had 10 years experience among the Indians, and has become proficient in agreeably dsaling with thsm.

Dr. Jackson is very popular and an expert in dealing with Indians, so that the combined lahors of these two gentlemsn have hssn crowned with success. These Puehlo Indians are peaceable, never having heen known to lift a hand against the white man. There is a heatsd controversy now going on among scisntists as to whetber they are direct descsndants of the Aztecs, or a differsnt race of people.

The Mining Regions of California.

The *Union Democrat* (Tuolumne Co.) says: The mineral region of California has produced an immense amonnt of money since mining was commenced in the Stats. The products of the minss huilt up San Francisco and other citiss, developed agricultural interests and furnishsd the mouey to improve all kinds of possessions and give the Stste great prominsnce abroad. Had there heen no mines there would now he a sparsely settled conntry in place of a great and powerful State. Singular it is, but true, that the locality producing this great wealth is to-day the poorest of any portion of the State. It is the least developed, altbough possessing some as fine agricnltural lands as can he found elsewhere. The climate is the best and healthiest that can be fonnd outdoors, yet it has heen made trihutary to the great centers and to the larger chauces for speculation in the lands of the valley. If bnt a moiety of the gold taken out of the ground, had been retained in the mining foothills, to develop their resources for prodncts of the eartb, and the establishment of industries, they to-day would be the most valnable and most songht for portions of the Stato. History of the mining connties all show, nnfortunately, that wbcn men bad large success in mining, they transferred their gains to San Francisco or to the valleys, leaving the land that gave them money, to languish aud go on its way in poverty. No section of country can have its suhstance taken from it and enjoy prosperity. What a nnmber gathered fortune from the mines in Tuolumne and took it all away leaving those less fortnnate to plod on as best they could. Experience bas shown that one good mine, the yield of which is devoted to the creation of property and for the puhlic good, is worth a dozen others, let them be rich as they may, when all hut the working expensss goes where it is of no more henefit to the county in which it was taken out. The mining rsgion has wealth remaining, sufficient to make it tbe richeat portion of the State, if it can he allowed to enjoy a reasonahle part of the yield of its mines. The man that works a mine and huilds a house, or establishes an indnstry, or adds to the improvements of his locality is entitled to the warm support of his neighhors. He is worth all the adventurous speculators that can come, who immediately ship away every dollar they get ahove necessary expenses for working their mines. Of course meu can come with means and work and do what they please with their profits. There is no law that can ahridge that right, yet the interest of the community cannot help heing greater for the mine owner that invests his profit at home. After so many years of constant drain, keeping the county from that prosperity it should enjoy, it would he a grand thing if our mines could get into hands that would devote a portion of their gains to improve and make more valuahle the surroundings. It is not for the want of rich resources that the mining region is less prosperous than elsewhere, it is from the fact that fast as the wealth is gathered it is pnt hsyond heing of any henefit to that region.

Chinese River Mining.—A company of Chinese miners are working in the hed of Bear river, a short distance helow the mouth of Greenhorn creek. They bave diverted the watsr in the streams by means of enhankments, so that it runs close to the Nevada side, leaving a large area of ground dry. They have sunk a large pit into this, which is compact sand and gravel, the washings from the mines, down to the original hed of the river. The depth is 16 or 18 ft, which makes heavy stripping, as all the top dirt has to he wheeled out in barrows. The pit is kept dry of the sipage water hy the nsual water-wheels used in river mining, in the erection of which the Chinese always show as much ingenuity as the white men. The Chinese are always reticent as to their snccess in mining, hut from the fact that the same company has worked that part of the river for several years in snccession, the inference is that they have paying ground.—*Grass Valley Union.*

A $40 nngget was found on Weaver creek, near Osceola, last week.

Middle Portion of the Comstock.

The Virginia *Enterprise* says: Our stock dealers and dahhlers are heginning to wake up. They havs had a long snooze. It is to he hoped a fosman worthy of their "stsal" will soon riss up. No one would object to seeing something like the stock hattles of yore. After years and years of waiting we shall now see something done in the middle mines in the way of prospecting. Thus far, siuce the draining of those mines of the ancisnt flood, the only work done has heen preparatory—the running of drifts. In the Chollar and Potosi mines a joiut drift of great length was run long ago on the 2400 level. Now that the hydraulic pump at the Chollar-Norcross-Savags shaft is working all right, this drift is heing cleaned out, preparatory to prospecting ths grouud of hoth companies.

There is in ths Potosi, also in Ohollar, a vast deal of virgin ground. From the 2400 up to the 1900 lsvel the ground is unexplored. In the Potosi is a considerahle length of grouud that is virgin from the surfacs down. All this ground is now to he opened up. In it tbers is room for half a dozsn big honanzas, and lst us hops that ore may have utilized all the space at band.

The Savage folks are now getting ready for business. On their 1300 level to the northward they have a great hrsadth of quartz containing more or less metal, and on the 1600 level the Sutro tunnel cut through a solid body of quartz over 80 ft in width. This quartz really gives assays tbat show it to hs almost, if not quite, a "milling proposition." In places ars spots of very rich ore. From one of these an assay of ovsr $2,000 was obtained. This proves not only that ths quartz is fertile but also that it is capahle of producing as rich ore as has ever heen found on the Comstock. All that is known ahout this immense body of quartz, is what is to be seen in the oue spot where the Sutro tunnel folks cut through it. No one knows what lies in the big quartz deposited 10 ft to the north or soutb of the tunnel.

The hody on the 1300 level is also unexplored at depth, hut already the water has so far receded that oxplorations may be commenced on the 2200 level.

At the Gould & Curry and Bsst & Belcher shaft they must one of these days cut into the same hig body of quartz that was passed through hy the Sutro tunuel. As it is to the west of the shaft they should not even now have far to drift in that directiou hefore cutting it.

At tbe Yellow Jacket, on the 282S level, they have an 80-ft. vein of quartz, which is shown to be metal-hearing hy the only hole that has ever yet bsen drilled iuto it. For all anyone knows to the contrary there may he paying ore at a distance of a few fest from this hole in any direction—north or south, up or down. They are now pnshing their main drift north, aud will soon again hore through this deposit and in dne time will cut it up with drifts and crosscuts.

Besides this prospect thsre is the very promisiug vein cut through hy the south hranch of the Sutro tunnel, lying out to the eastward of the shaft. This is as yet wholly unprospected. Wben cut through it was rapidly widening (at the rate of two ft. in eight) to the northward.

From tbis hasty glance it will be seen that there is much of promise lying withiu that portion of the lode bounded by the Yellow Jacket shaft on the south aud the Oshiston shaft on the north.

The Bullion Product.—Wells, Fargo & Co.'s report of the semi-annual production of preoious metals on the Pacific coast, just issusd, is as follows: Gold, $9,418,378; silver, $29,826,400. The report wns prspared hy John J. Valentine, Superiutendent of Wells, Fargo & Co.'s express, from the hooks of the company, and is authentic. This rate continued during the remainder of the year will aggregate for 1881 about $80,000,000, the largest hullion prodnction since 1874. Though the Comstock mines declare no dividends, they produce considerahle hullion, and Eureka and other outside camps in Nevada have increased their yield during the first six mouths of the year. Arizona, too, has prodnced considerable hullion this year, which has to some extent made up for the deficiency of the Comstock. The aggregate yield shows that notwithstanding the supposition that mining was on the wane, tbe amount of bullion prodnced from January to July, 1881, on this coast, is larger than it has heen for years. This will nndouhtedly encourage new enterprises, as it will attract the atteution of capital uow seeking investment in the East to the Pacific States and Territories, as it shows conclusivsly that mining is as productive to-day as it has been at any time since 1874, when the Comstock honanzas were producing millions annually.

The Paradise Mines.—A correspondent of the *Silver State*, writing from Spring City, says the mining prospect is so enconraging that several parties have gone into the husiness of jumping lots in that village. The Philadelphia gentlemeu, Messrs. Dow and Chandler, who visited the camp last week, are well pleased with what they saw. They paid all dehts that had heen incurred by the Red Dear company, in which they are interested, and set a force of men at work on Monday under the supervision of Frank Gregor. They made a thorough inspection of the mines, and concluded to huild a mill this fall, on a site selccted hy them at the north end of Spring City. Lots are consequently sought for, and cahius, chicken honses, etc., are being moved on favorable locations, to hold them.

MECHANICAL PROGRESS.

Cutting-Tools and their Uses.

A correspondent to the mechanical department of the Boston *Journal of Commerce* gives the following interesting and instructing *resume* in regard to the use and action of cutting-tools:

"Cutting," as generally understood, is illustrated in the cutting of bread by a bread knife, the slicing of meat by a carving knife, the whittling of wood by a pocket knife, and other handy methods of using the knife, razor and similar implements. All these methods depend upon their utility by drawing the cutting edge over the substance, and not merely separating fibers by breaking them or cutting them square across. This method of cutting is not applicable to metals, to ivory, and to other substances whose rigidity is greater than their tenacity, nor to those whose compactness is greater than their porosity. As instances: cast steel and cast iron are rigid and compact, while wood and baked wheat in the loaf are porous and tenacious. The one cannot be properly cut by a drawing cut, while the other cannot be readily cut by any other method.

A wedging cut is a violent disruption of the particles by blows or pressure, and consists in lifting the particles to be moved from those which are to remain. In the case of the cold chisel the particles are driven in front of the edge of the chisel by blows; in the case of the planer cutter they are pressed forward by the movement of the planer platen against a fixed cutter; and in the case of the lathe the cutter lifts the material on a rotary motion which allows the cutter to operate on an inappreciable amount of material for an almost infinitesimal period of time. So it will be noticed that while a turning tool in a lathe may be so used as to leave hardly any marks of its progress, a similar tool on a planer shows its progress, and leaves its results not only visible but in actual ridges.

The separating of parts of a substance by shearing—one cutter operating against another—is not "cutting" in the proper sense of the term—it simply means that there is not space for the material to pass between two closely opposing obstacles. In the sense of edge tools, the wheels of a locomotive or of a railroad car are as much so when combined with the rail, as the two blades of a pair of scissors; so scissors can hardly be called "edge tools."

In fact there is no such thing as a positively cutting mechanical tool. The sharpest edged drawing tool, as a razor, is merely a means of separating portions of material that have already invited to a rupture by the spaces between their particles. The razor simply finds its way between them because it has a thin, wedge-like edge, and when the separation is completed, the microscope shows the ends of the separated hairs as the sheared ends of grass stalks the scythe has cut; and this cut is a shearing cut, not a positive, square, diametrical separation. Even when the heaviest, most rigid and most exact shearing machines in use in our shops and large manufactories merely cut bars to crude lengths; and if exactness is required, the bars are placed in a cutting-off lathe that gradually turns a score from circumference to center, cutting its way by means of a fixed chisel against the rotation of the shaft, or bar. All this slant or "shear," as mechanically called, is occasioned by the resistance by the material to the intruding cutter, and in no case does it allow the cutter to pass without presenting the obstacles of its matter.

With the best, most closely geared, and rigid planer it is impossible to produce an equable, smooth surface, even with the finest feed. In fact, it is impossible to produce a surface that does not show the "planer marks" to the naked eye. The best finished planed surfaces of the finest gray cast iron or low steel, must be scraped to surface to *have* a surface. Between every ridge of the finishing cut of the square-nose tool of the planer shows a dark gray furrow, in plain distinction to the polished ridge. Under the microscope, the polished ridge is a burnished ridge, the disturbed and serrated particles being erect or bent, but crowded by the passage of the non-cutting portion of the tool, while every longitudinal depression shows the particles of the disturbed metal standing up like the horrified bristles of the annoyed porcupine. To produce an even surface, hand manipulation is brought into action by scraping, which more gently removes the superabundant surface, and allows us to claim, in our coarse mechanical way, a "true surface." But even this is only an approach to absolute perfection; yet scraping is nearer actual cutting of the metal than the best preliminary of the planer.

Probably the lathe gives the best first results of cutting metals. With a fine feed and broad-nosed tool we can get a very good surface requiring but little abrasion to bring ridges down and depressions up to a general surface. And even in this case all the after finish is but a repetition of the former action. Whether the material used as a tool or an abrasive substance, the action is merely a cutting away of the superabundant material.

Burnishing or metals simply means returning to its place the disturbed particles, but even that does not close up perfectly the gaps left by the removal of portions of the material. In short, there is no absolute cutting of materials. The best we can do by our best mechanical means is to remove unnecessary material and make the disturbed surface conform, in some approximate degree, to a fixed gauge, or to some other surface it is intended it should fit.

Cutting implements, whether edge tools or other appliances, are merely means of separating rejected from useful portions of material, and do not reach the particles of the material itself. We can give no perfect surface to material simply by removing a portion. We may reduce in size, and make fits, but the best surface given by mechanical means is a depression of torn or ruptured surface by burnishing, or the mechanical-chemical action of friction and heat, as shown in the interior of a steam cylinder or on the face of a steam valve.

Belting Material.

There can be but little doubt in the minds of observing mechanics that we are on the eve of a revolution in the selection of material for belting. Leather has already been largely superseded by rubber, but the latter also fails to give the full satisfaction desired. Cotton is coming largely into use in Europe. In regard to this material Kirkaldy, of London, whose test works are known throughout Europe, has shown that an 8-ply cotton belt is capable of sustaining nearly double the breaking strain of the best six-inch double leather belt, whilst it is little more than half the cost. Cotton belting is now in use in some 10,000 mills abroad; the demand is at present larger than the supply. So many annoyances attach to leather belting, that its supercession by a more durable material, possessing all the requisite elasticity without any tendency to give will be a matter of general congratulation.

It is furthermore reported in *Engineering* that *paper* belting is successfully used in the machinery hall of an exhibition recently held in Japan. The Japanese have long been celebrated for their manufacture of some exceedingly tough descriptions of paper, and it is stated that the paper belting has been tested and found much stronger than ordinary leather. Now that machinery is rapidly making its way into Japan, the manufacture of this paper belting is of special interest to this country, as from the want of proper tanning good leather is not made by the Japanese.

CARBON IN STEEL.—Prof. Leeds has found that the amount of carbon in a piece of steel which had been purposely burned was the same as in a similar piece which had not been burned; the burning, however, was of the steel itself, which contained a large amount of the oxide of iron; that is, the metal, instead of the carbon, burned. The heat, he says, does not harm steel or iron, and consequently they may be heated and cooled an unlimited number of times, provided they are not brought in contact with the air and so take up oxygen. In heating a piece of steel, the amount of blast has more to do with the burning than the heat; and if the extra amount of oxygen which a burnt piece of steel has taken up is taken out of it, it can be made to work just as well as it did before. The proof that the heat does not harm the steel is found in the fact that if the steel is put in a closed box, and luted up so as to keep out the air, it can be heated and cooled an unlimited number of times without injury.

A MECHANICAL COTTON PICKER.—This new invention, the appearance of which has for some time been foreshadowed—the combination cotton picker, with fingers of iron—will no doubt work a revolution in cotton-growing. It will, it is claimed, make a reduction in the price of growing of two cents per lb. The machine, by means of heaters and fans, takes the fiber from the boll, removes the seeds and all impurities, finally delivering it straightened and ready for the bale. Efforts are making to develop the machine in time for the exhibition at Atlanta.

NOTE.—If iron is placed in a furnace and completely covered with soot, the temperature then raised to a red or white heat, and continued for 15 or 30 minutes, or longer, according to the mass of iron to be operated upon, and then removed from the furnace and allowed to cool, the surface will be found thoroughly cleansed and covered with a coating which is impervious to rust under ordinary circumstances.

A FOUR-CYLINDER ENGINE.—An experiment is being made on the Providence railroad of an engine with four cylinders, double the usual number, the advantage claimed being increased speed, with less danger of leaving the track, and a much steadier motion while running.

NEW VARIETY OF COAL.—The *Jahrbuch fur Mineralogie* says that a new variety of coal, said to be the most highly carbonized member of the coal series hitherto described, has been found near Schunga, on the western shore of Lake Onega. It contains about 91% of carbon, 7% or 8% water and 1% ash; it is extremely hard and dense, has an adamantine lueter, is a good conductor of electricity, and has a high specific heat—0.1922. Although containing as much carbon as the best graphites from Ceylon, it is not a true graphite, inasmuch as it is not oxidized by potassium chlorate and nitric acid, but behaves toward those reagents like an amorphous coal.

The *Textile Colonist* suggests that novel and striking effects might be produced in tissue printing by means of Balmain's luminous paints.

SCIENTIFIC PROGRESS.

Prof. Winchell on Evolution.

In a recent lecture before the Summer School of Christian Philosophy, at Greenwood Lake, Prof. Alexander Winchell, of the University of Michigan, discussed the speculative consequences of evolution. Speaking of the predicament of those who state all religious truth on an allegation of the untruth of evolution, in case the method of nature is finally found to be a method of evolution, he said:

"At this moment the well-nigh unanimous verdict of the scientific world sustains the doctrine of evolution. This verdict is one of the criteria of truth. Repudiation of it is a hazard which only rashness and ignorance will incur. To stake all religious belief on such repudiation is to throw all of man's spiritual interests upon the hazard to die. As I understand it, the recognition of a method of evolution in nature's operations does not involve consequences deleterious to a spiritual faith, but is a means, on the contrary, for approaching into closer relations with the immaterial forces of the Divine government of the world. We must first establish a clear conception of evolution. Multitudes of men imagine evolution and Darwinism to be synonymous terms, if they do not even believe them synonymous with materialism as is so often charged. I conceive the evolution which I discover in nature to be the progressive differentiation of an identical existence. It proceeds from the more general to the more special, from the homogeneous to the heterogeneous. It means that new forms of existence are only older existences transformed and not new beginnings of existence. Every department of the cosmos has had a history, and every present is the outcome of a past. It takes no cognizance of special originations, but only of the history which follows. Evolution, I say, knows nothing of creation. This is not because it contravenes creation, but simply because creation is an event which does not come within its purview. Evolution is the name of a mode of continuance, not of a mode of beginning. It can neither affirm nor deny any mode of origin."

OZONE.—Em. Schoene calls attention to the fact that, since the existence of hydrogen superoxide in the air has been demonstrated, the occurrence of ozone as a constituent of the atmosphere has become very doubtful. Most of the reactions formerly relied upon for the detection of ozone are also produced by hydrogen superoxide. The latter liberates iodine from the iodides and oxidizes thallous compounds. It does not oxidize manganous salts, but such oxidation cannot be regarded as an evidence of the presence of ozone, since ordinary oxygen in the presence of carbonate of ammonium—which is always to be found in the air—will effect it. The tarnishing of silver may be, and probably always is, due to the presence of sulphides. The odor sometimes observed and ascribed to ozone is at best a questionable argument for its presence. Most observers would be liable to confound the odors of ozone and hyponitric acid. Moreover, ozone is not produced by the electric spark in a mixture of oxygen and nitrogen, but only oxide of nitrogen, hence the fact of visible electric discharges in the air is no evidence of its formation. It is produced by the silent discharge, but of this, as an atmospheric phenomenon, we still know too little to justify us in regarding it as a probable source of supply.

MUSCULAR ACTIVITY AND THE DECOMPOSITION OF MATTER.—The requirements of an organism for the exertion of energy can become a cause of the decomposition of the components of the nutriment and of the body. Non-azotized materials are first attacked, and if such are insufficient or have been consumed, a decomposition of the organized albumen takes place. This decomposition of the albumen of the body can only be arrested by an increase of food, especially of its non-nitrogenous portion. Even a very abundant supply of albumen cannot prevent the destruction of organized albumen if the total quantity of nourishment is not sufficient for the requirements of the force to be exerted. It is possible and probable, that in consequence of the increased demand for oxygen during work, a larger quantity of circulating albumen is necessary than the minimum required by the organism when at rest.—*Dr. O. Kellner.*

ANOTHER PREHISTORIC MAN.—Some human remains, evidently of great antiquity, says the *Academy*, were discovered a few months ago at Carahacel, near Nice, and have been reported upon by a local scientific committee, as well as examined by M. de Quatrefages. The bones had not been artificially interred, but were found embedded in a deposit of calcareous clay, at a depth of about nine ft. from the surface. This deposit was irregularly stratified, and contained a mixture of pliocene and eocene shells, showing that it had been formed by the reconstruction of the pre-existing strata. Of the bones the most remarkable is the lower jaw. This is sufficiently characteristic to enable De Quatrefages to refer it to the Cro-Magnon type. The fossil man of Nice, therefore, belongs to the same race as M. Riviere's skeleton from Mentone, both being probably of Paleolithic age.

Water and its Impurities.

Water, which consists, in its purity, of one atom of oxygen combined with two atoms of hydrogen, is never found pure except in the chemical laboratory. Pure water exerts a solvent action upon many gases and solids, and whenever it is exposed, as in nature, it always takes into its embrace something foreign to itself, and as a general thing, especially in the case of surface water, something deleterious to its use for drinking purposes.

Still, absolutely pure water is decidedly unpleasant and insipid to the taste; in fact, it is quite unfit to be taken into the system. The sparkling and refreshing effect of spring water as a beverage is chiefly due to the presence of carbonic acid gas. Free oxygen probably exists, to a very small extent, in spring water. A person may descend in a diving bell and remain for 24 hours or more under water, without any communication with the atmosphere, if he is simply provided with the means of throwing a spray of water through the atmosphere of the bell two or three times each hour. The spray absorbs and thus removes the carbonic acid, which results from breathing, and at the same time liberates sufficient pure air to take the place of that which has been vitiated and removed as carbonic acid. No doubt a small quantity of free oxygen is also liberated from the spray and passes into the lungs, either as oxygen or ozone.

The presence of certain dissolved gases in water and some minerals are in every way beneficial, while the presence of others is decidedly hurtful and often exceedingly dangerous. Oxygen, either free or in its various combinations with other substances than hydrogen, exerts an important influence in the solution and removal from water of organic matter impurities; but at the same time those solvent qualities often take up and hold in solution solids which are highly deleterious—such, for instance, as lead, etc.

Too much care cannot be taken in a thorough examination of the water we use as a beverage. Though we do not and ought not to drink pure water, we should know for a certainty what impurities we are taking into the stomach. Such knowledge is too seldom acquired, but it would be greatly to our advantage if more effort was made for a knowledge that would lead us "to wonder at the wisdom which works through intricate and complicated labyrinths to a perfect and simple end, and to admire the ultimate tendency and result of even such seeming anomalies as the 'impurities of water.'"

CAUSE OF REDDENING OF CARBOLIC ACID.—It has often been noticed that commercial carbolic acid generally assumes a reddish color. Different specimens differ in their degree of colorization. Careful experiments have shown that this color is due to the presence of copper. This color is especially manifested if ammonia be added to the solution. When the colorization is hastened by adding ammonia, it is of a darker red than without the ammonia. The presence of copper is supposed to arise from the traces of that metal found in the coating of the tinned iron vessels in which the acid is generally put up for the market. Now, will some one tell us why a solution of salycilicate of soda so frequently turns dark on exposure to light in a glass vessel. We have frequently known it to assume almost the color of ink after an exposure of a week or two. Then again, we have known it to retain its original color with only the merest shade of turning for months. In the cases referred, the samples have been obtained from different druggists.

PARASITIC WORMS.—Mr. Frederick W. True, of the Smithsonian Institute, a rising young student who has taken up the little known subject of intestinal and other parasitic worms, has lately endeared himself to the Ichthyophagous Club by his statement, in *Forest and Stream*, that fishes are more or less populous with these tenants. The salmon has 16 different kinds; the pike at least 20, and the carp so many as a dozen in its native waters. None, of them, however, resemble trichinæ "except as a garter-snake resembles a copperhead;" and they are as harmless when eaten as worms in cherries, being out of their element in the stomach of the warm-blooded human. Mr. True, wishing to follow up the useful if not pleasing investigation, invites anglers and sportsman generally to advance the study of American helminthology by preserving in spirits and sending to him at Washington, D. C., any specimens of parasitic worms which they find in game, fish and other animals.

THE ASTRONOMER ROYAL.—It is reported that Sir Geo. Airy is about to relinquish the office of Astronomer Royal, which he has filled since 1835 with so much honor to himself and advantage to the science of astronomy. He resigns his position on account of the increase of rest called for by his present state of health and advancing years. It is to be hoped that he will long enjoy the sentiment he has so well earned by the energy and devotion with which, throughout his long career, he has discharged the responsible duties of his office, to say nothing of the many improvements which his great scientific attainment and mechanical skill have enabled him to introduce into the Royal observatory.

WATER IN GEMS.—An Atlanta paper reports the recent finding, in Rauhin county, Georgia, of an amethyst bearing a drop of water or similar liquid in a cavity near the center of the stone.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 4.		Week Ending Aug. 11		Week Ending Aug. 18		Week Ending Aug. 25	
Alpha	3.90	3¼	4.05	3⅞	4¼	3.85	4.40	4¼
Alta	4.15	3⅞	4.05	3.90	4.35	4.10	4.15	3.80
Andes	1.45	1.30	1.45	1	1.40	1	1.30	1.15
Absiou	1⅞	1.40	2.10	1.55	2.10	1.80	1.90	1.55
Argenta	5c	....	15c	....	....	....	....	....
Addenda	10c	5c	10c	5c	30c	15c	30c	25c
Belcher	3.10	2.80	3.10	2.85	3⅛	2.90	3.30	3.10
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	11¼	9⅝	10¾	9⅝	13	10⅜	13¼	12½
Bullion	60c	45c	60c	45c	70c	50c	1.45	70c
Bechtel	1.45	1.20	1.45	1.30	1.30	1	1.15	1.05
Bel Isle	25c	....	20c	15c	20c	15c	20c	....
Bodie	6⅞	6¼	7⅛	7	10½	7⅞	9⅜	8⅛
Benton	1	90c	95c	90c	1	95c	1	85c
Bulwer	2⅞	2⅜	2¼	....	3¼	3	....	....
Boston	40c	25c	30c	....	30c	25c	....	....
Black Hawk	5c	....	10c	5c	30c	5c	25c	20c
Belvidere	....	....	45c	....	50c	....	50c	....
Booker	....	....	....	....	....	....	....	....
Caledonia	15c	10c	40c	10c	40c	30c	45c	40c
California	90c	70c	1	90c	1.05	90c	1.10	1
Challenge	....	....	100c	75c	95c	90c	95c	90c
Chollar	2.20	2.10	2¼	2.10	3.10	2.15	3.05	2⅛
Confidence	3.70	....	4	3⅛	4¼	4⅛	4¼	4
Con Imperial	15c	10c	15c	10c	20c	15c	20c	15c
Con Virginia	2.15	1⅞	2	1.85	2.35	1.40	2.30	2
Crown Point	2.05	1.80	2¼	1.90	2¼	2	2¼	2.10
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	75c	50c	1.60	....	1⅛	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	25c	20c	40c	20c	70c	50c	75c	60c
Derbec	....	....	....	....	....	....	....	....
Day	2⅜	2¼	2.65	2¼	2¼	2	2.15	2¼
E. Mt. Diablo	15c	10c	16c	15c	15c	....	15c	....
Eureka Con	28	25	25	23½	29	23	....	....
Exchequer	1.15	1.05	1.15	1.10	1¼	1.10	1.30	1.10
Endowment	....	....	....	....	....	....	....	....
Grand Prize	25c	15c	20c	15c	15c	10c	15c	....
Golden Gate	....	....	2¾	....	2.80	2⅜	....	....
Goodshaw	50c	40c	45c	40c	65c	55c	65c	60c
Gould & Curry	5¼	4⅜	5⅜	4.80	7⅜	4.95	7⅜	6⅛
Hale & Norcross	3.20	2.95	3.10	2.95	4.35	3.30	4.40	3.80
Head Center	95c	90c	....	....	1	....	1	....
Hussey	....	....	....	....	....	....	....	....
Independence	5c	....	....	....	....	....	....	....
Julia	40c	35c	30c	....	40c	30c	45c	35c
Justice	80c	75c	85c	75c	90c	80c	85c	75c
Jackson	50c	....	75c	50c	....	....	75c	....
Jupiter	....	....	10c	....	20c	15c	25c	....
Kentuck	2¾	....	3	2¾	3	2¾	3	2.10
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	20c	....	25c	15c	20c	....	15c	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	30c	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2	....	2	....	2	....	1¼	....
Martin White	....	....	25c	....	....	....	30c	20c
McClinton	....	....	....	....	20c	10c	10c	....
Mono	2.70	2¼	2⅝	2.30	4.35	2.65	3.90	3.75
Mexican	8⅛	7⅛	8⅞	7⅜	9⅞	8⅜	11⅜	10⅛
Mt. Diablo	5⅜	....	....	7	....	6½	....	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1	75c	1	90c	1¼	1.10	1.55	1
New York	10c	....	10c	5c	20c	10c	20c	10c
Northern Belle	15⅞	12½	15	14	15⅞	14⅜	15⅞	14⅜
North Noonday	55c	50c	55c	50c	90c	55c	70c	55c
Navajo	75c	....	75c	70c	65c	....	65c	....
Occidental	1.40	1.35	1.35	1.30	2	1¼	1.80	1¼
Ophir	5½	5	5⅝	5	6⅞	5½	7⅜	6⅜
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.30	1.05	1.20	1.10	1.40	1.05	2	1.20
Oro	65c	45c	55c	50c	70c	45c	50c	45c
Paris	15c	....	....	....	40c	....	25c	....
Potosi	2.80	2.45	2.65	2.45	3⅛	2.55	3.35	3
Queen Bee	....	....	....	....	10c	5c	....	....
South Bulwer	....	....	....	....	80c	25c	....	....
Savage	2.80	2¼	2⅝	2.40	3⅜	2.40	3.85	3.10
Seg Belcher	....	....	5½	5	6	5	6½	....
Sierra Nevada	9½	8⅝	9⅝	8⅝	13⅜	8⅛	17	13⅜
Silver Hill	15c	....	15c	10c	20c	10c	15c	....
Silver King	20⅛	20	20⅞	20⅛	20⅞	20	20⅛	20
Sucor	....	....	....	....	....	....	....	....
Summit	30c	25c	25c	....	50c	25c	....	....
Scorpion	1.35	1.05	1.40	1⅛	1⅛	1.35	1.80	1.15
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	5c	....	....	....	10c	....	5c	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	40c	....	50c	40c	50c	45c	50c	....
Tioga Con	35c	....	25c	....	1.05	40c	45c	35c
Tiptop	5½	5⅛	5⅝	5⅛	6	5⅛	6⅛	5⅛
Tuscarora	....	....	....	....	25c	20c	....	....
Union Con	9⅛	8⅜	10	9⅛	12	9⅛	14⅛	11⅜
Utah	8⅛	7⅜	8⅝	8⅛	11⅛	8⅜	11⅜	10
Ward	....	....	2.40	....	2¼	....	....	....
Wales	1.10	1	1.10	50c	80c	50c	75c	50c
Yellow Jacket	4.55	4.05	5¼	4.40	6¼	4.95	8⅛	5⅞

Sales at S. F. Stock Exchange.

Thursday A.M...Aug. 25.

155	Alta	3.80	
380	Andes	1.15@1.20	
370	B & Belcher	12¾@12¾	
460	Belcher	3.10@3.15	
165	Bullion	1.30@1¼	
390	Benton	.95@90	
710	California	1	
2990	Con Virginia	2.05@2	
585	Chollar	2¼@2.45	
350	Crown Point	2.15	
660	Con Imperial	.20@15c	
100	Challenge	.90	
5	Confidence	4	
600	Calsdonia	40c	
400	Exchequer	1.15@1.20	
640	Gould & Curry	.6¼@7	
640	Hale & Nor	3.80@3.90	
920	Julia	.45@40c	
250	Justice	.80@75c	
85	Kentuck	2.10	
100	Lady Wash	15c	
650	Mexican	10¾@10½	
200	New York	10c	
285	Ophir	6.30@6	
100	Overman	1.90@1.85	
100	Occidental	1¼	
100	Orig Gold Hill	15c	
610	Potosi	3.05@3	
1030	Savage	3.15@3.10	
475	Silver Hill	15c	
1615	Sierra Nevada	14@14¼	
325	Scorpion	1	
200	Sutro	20c	
1175	Union	12¾@12¾	
90	Utah	10@10¼	
305	Yellow Jacket	5¾@5¾	
	AFTERNOON SESSION.		
360	Addenda	25c	
200	Alhion	1.70	
500	Belle Isle	20c	
130	Bodie	9	
125	Bechtel	80@90c	
200	Bodie Tunnel	3.05@3	
200	O Pacific	50c	
700	Day	2.30	
100	E Mt Diablo	10c	
100	Goodshaw	55c	
200	Grand Prize	5c	
100	Giant & O A	2	
400	Holmes	45c	
20	Jackson	60c	
100	Mono	3¼	
200	McClinton	15c	
130	Northern Belle	16	
200	Navajo	50@60c	
400	Noonday	1	
300	Oro	50c	
150	Star	30c	
70	Silver King	20@20¼	
150	Tiptop	5¼	
250	Tioga Con	35c	

Meetings and Elections.

GOLDEN FLEECE GRAVEL M. Co.—Aug. 13. Directors—O. F. Graves, Jno. O'Brien, A. Wason, D. S. Chisholm, Fr. Schirmeir.

SOUTH COMSTOCK M. Co.—Aug. 15. Directors—R. Sherwood, J. M. Buffington, F. G. J. Margeteon, H. F. Cutter, O. H. McKee. President, R. Sherwood; Secretary, J. M. Buffington.

INDEPENDENCE M. Co.—Aug. 15. Directors—A. W. Foster, F. A. Berlin, J. F. Tichenor, S B. Wakefield, E. M. Hall. President, A. W. Foster; Vice-President, F. A. Berlin; Secretary, E. M. Hall.

MACKAY & REVOLUTION M. Co.—Aug. 16. Directors—Robert Sherwood, John W. Harker, Horace Webeter, Geo. L. Bradley and W. S. McCormick. The MacKay and Revolution mine adjoins the famous Emma mine in Utah.

MINING claims have been located near the junction of Hay fork with the south fork of Trinity river in Trinity county. There is much excitement among the residents of the locality, and 30 or 40 claims, each 1,500 ft. frontage, have been located. The surface ore is said to contain gold, silver and copper.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	21	50	Aug 2	Sept 6	Sept 26	W H Watsou	302 Montgomery st
Andes M Co	Nevada	17	50	Aug 8	Sept 14	Oct 4	B Burris	309 Montgomery st
Ahton Con Co	Nevada	8	40	Aug 1	Sept 5	[Sept 26	D B Chisholm	327 Pine st
Aurora M Co	California	3	10	July 5	Aug 6	Aug 31	P Conklin	535 Market st
Addenda M Co	California	5	10	July 11	Aug 17	Sept 6	T H Dixon	238 Montgomery st
Argenta M Co	Nevada	8	10	July 7	Aug 11	Sept 2	E M Hall	327 Pine st
Bullion M Oo	Nevada	20	60	July 21	Aug 25	Sept 15	J M Brazell	328 Montgomery st
Belmont M Co	Nevada	29	15	July 27	Aug 30	Sept 26	J W Few	310 Pine st
Best & Belcher M Co	Nevada	21	50	July 12	Aug 16	Sept 7	W Willis	309 Montgomery st
Caledonia M Co	Nevada	36	25	July 7	Aug 11	Aug 31	R Wegeuer	414 California st
Con Amador	California	2	1 00	Aug 3	Sept 6	Sept 24	F B Latham	328 Montgomery st
Con Imperial	Nevada	16	10	Aug 22	Sept 27	Oct 18	W E Dean	309 Montgomery st
Con Pacific M Co	California	3	40	July 9	Aug 1	Sept 1	F E Luty	330 Pine st
Con Virginia M Co	Nevada	16	30	Aug 2	Sept 24	Oct 22	A W Havens	309 Montgomery st
Grand Prize M Co	Nevada	6	25	July 30	Sept 8	Sept 29	E M Hall	327 Pine st
Gould & Curry S M Co	Nevada	40	50	July 15	Aug 19	Sept 8	H K Durbrow	309 Montgomery st
Gila S M Co	Nevada	8	25	July 22	Aug 22	Sept 6	J T McGeoghegan	318 Pine st
Hale & Norcross S M Co	Nevada	70	50	July 12	Aug 16	Sept 7	J F Lichtner	309 Montgomery st
Independence M Co	Nevada	8	15	Aug 25	Sept 26	Oct 17	E M Hall	327 Pine st
Juniata Con M Co	Nevada	5	04	Aug 18	Sept 19	Oct 8	C Y Hubbard	310 Pine st
Kentuck M Co	Nevada	16	50	Aug 22	Sept 26	Oct 17	A C Stuart	234 Montgomery st
Meadow Valley M Co	Nevada	16	30	Aug 1	Sept 10	Oct 4	H DeLaguna	414 California st
Mariposa L & M Co	California	21	1 00	June 8	Aug 10	Sept 7	L Leavitt	309 Montgomery st
Mono M Co	California	13	50	Aug 6	Sept 12	Oct 3	W H Lent	309 Montgomery st
Mt Potosi M Co	Nevada	7	15	Aug 12	Sept 17	Oct 10	J H Sayre	330 Pine st
North Gold King M Co	Arizona	6	25	July 8	Aug 13	Sept 5	E A Holmes	318 Pine st
North Noonday M Co	California	3	50	June 28	Aug 5	Aug 29	Wm J Traylor	310 Pine st
Oneida M Co	California	15	3 00	July 21	Aug 29	Sept 20	H P Bush	431 California st
Overman M Co	Nevada	50	50	July 20	Aug 24	Sept 14	G T Edwards	414 California st
Seg Belcher M Co	Nevada	19	1 00	Aug 3	Sept 6	Sept 27	G D Edwards	414 California st
Silver Hill M Co	Nevada	10	25	Aug 16	Sept 19	Sept 10	W E Dean	309 Montgomery st
Tioga Con M Co	California	14	20	Aug 16	Sept 22	Oct 12	W H Lent	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M Co	California	3	15	Aug 22	Sept 22	Oct 10	J M Buffington	309 California st
Alpha Hydraulic M Co	California	3	25	Aug 20	Sept 27	Oct 18	J Ireland	216 Sansome st
Black Hawk M Co	California	12	10	July 15	Aug 19	Sept 9	H A Charles	419 California st
Delano M Co	California	2	03	Aug 13	Sept 16	Oct 7	J Morizo	328 Montgomery st
East Noonday M Co	California	2	05	Aug 2	Sept 8	Sept 24	C V Huhhard	310 Pine st
Harrington M Co	California	2	05	June 15	Sept 14	Oct 4	O O Muller	409 California st
Iowa M Co	Nevada	14	05	July 27	Sept 12	Oct 5	C S Leavitt	411½ California st
Lodi M Co	Nevada	3	05	July 19	Aug 22	Sept 12	A B Paul	328 Montgomery st
Lodi M Co	California	3	05	July 19	Aug 22	Sept 12	A B Paul	328 Montgomery st
McMillen M Co	Arizona	3	20	Jan 12	Aug 26	Sept 26	J Morizo	328 Montgomery st
May Flower G M Co	California	12	10	July 19	Sept 7	Sept 28	J Morizo	328 Montgomery st
Morgan M Co	California	7	50	July 6	Aug 16	Sept 13	J Raphael	533 Kearny st
New York M Co	Nevada	26	10	July 16	Aug 18	Sept 8	D L Thomas	327 Pine st
North Gould & Curry M Co	Nevada	1	25	July 15	Aug 15	Sept 6	N C Southard	331 Montgomery st
Navajo M Co	Nevada	8	25	Aug 19	Sept 22	Oct 13	J W Few	310 Montgomery st
Oro M Co	California	9	25	Aug 16	Sept 21	Oct 12	W Stuart	320 Sansome st
Oakland M Co	California	16	05	July 30	Aug 31	Sept 19	R D Hopkins	436 Montgomery st
Santa Anita M Co	California	1	13	Aug 20	Sept 25	Oct 10	J B Titus	34 Kearny st
Sherwood M Co	Nevada	3	05	Aug 11	Sept 19	Sept 10	J M Buffington	309 California st
Sierra M Co	Nevada	69	1 00	July 15	Aug 18	Sept 6	E L Parker	309 Montgomery st
Spaulding G & S M Co	California	2	10	June 28	Aug 23	Sept 15	J W Few	310 Pine st
University G M Co	California	9	10	Aug 15	Sept 20	Oct 12	Wm. L Oliver	328 Montgomery st
Western Home Con M Co	Idaho	2	05	Aug 16	Sept 26	Oct 26	A Halsey	328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Addenda M Co	California	T H Dixon	328 Mantgomery st	Annual	Sept 7
Arnold G & S M Co	——	A Judson	320 Sansome st	Annual	Sept 6
Booker Con M Co	California	W H Lent	309 Montgomery st	Annual	Sept 26
Halsted M Co	Nevada	R Van Brunt	318 Pine st	Annual	Aug 29
Home G M Co	——	R Ellon	310 Pine st	Annual	Sept 1
Lodi M Co	Nevada	A B Paul	328 Montgomery st	Annual	Sept 10
Mint M Co	California	H H Haskell	528 California st	Annual	Sept 26
Mono M Co	California	W H Lent	309 Montgomery st	Annual	Sept 6
Noonday M Co	California	W J Taylor	310 Pine st	Annual	Aug 25
Norwich M Co	Nevada	J B Curtis	310 Pine st	Annual	Sept 6
Old Judge M Co	——	J E Hill	230 Montgomery st	Stockholders	Aug 30
Putnam M Co	Nevada	A K Hartwell	609 Folsom st	Annual	Sept 5
Queen Bee M Co	California	G W Fisher	324 Pine st	Annual	Sept 5
Real del Castljo M Co	Nevada	A Judson	320 Ssnsome st	Annual	Sept 6
South Noonday M Co	California	W Stewart	320 Sansome st	Annual	Aug 27
Swamp Angel G M Co	California	Lewis Lillie	607 Washington st	Stockholders	Sept 15
Villa Grana M Co	Mexico	A Judson	320 Sansome st	Annual	Sept 6

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Aug 27
Father De Smet M Co	Dakota	H Dean	New York	50	June 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Aug 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Aug 15
Silver King M Co	Arizona	J Nash	315 California st	25	Aug 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Aug 12
Tip Top M Co	Arizona	H Deas	309 Montgomery st	20	Aug 25
Western M Co	California	O S Curtiss	309 Mo ntgomery st	75	May 12

The Mining Share Market.

There is not very much doing in stocks just now. In fact, they are rather shaky. The hydraulic pump at the Cbollar-Norcross-Savage shaft is working splendidly. The hulkhead on tbe 2400 level of the Savsge has been opened, and all the accumulated water was pumped out in 19½ hours—all the water from other sources being handled at the same time.

The Virginia *Chronicle* says: "The reason for the steadiness of the north end stocks continues to be the main conundrum propounded for solution on the Comstock. Wby Sierra Nevada shonld be qnoted four or five times higher than the middle stocks is not understood. While the prospects for Savage, Potosi and adjacent mines, in view of the successful working of the comhination pump, are very flattering, it is strennously denied at headquarters that any promising developments have hesn made in Union, Utah, Ophir, Mexican or Sierra Nevada, which leads the market. The superintendents of the mines at the north end are nnanimous in stating that there has bsen no development in them, and they profess to be unable to acconnt for their advance in valne."

The *Enterprise* says at the Savage the prospects are now quite flattering. The water in the incline had yesterday receded 22 ft. since taking out the hnlkhead on the 2400 level. In three or four days the pnmps will he started up, and the remainder of the water taken out. It is thought that the incline may bo drained in three days. Sinking will then he resumed; also, they will commence explorations on the 2300 level, where no work has yet been done. They will now very soon begin the extraction of ore from the 80-ft. body of quartz cut by the Sutro tunnel on the 1600 level. Although it is not generally known, they have next the hanging wall a deposit of very good ore. A careful examination with a view to milling shows that the first three ft. next to the clay of the east or hanging wall averages $134 per ton; the average assay of the next eight ft. west of this streak is $53.81. This gives ample room for opening out two square sets of timbers in width. Assays taken across the vein at this point show that a width of 33 ft. will average $24. There are, of conrse, spots to he found assaying up in the hnndreds.

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Barhee & Walker, Aug. 16, $2,102; Hananer, Ang. 16, $2,400; Germania, Aug. 16, $1,980; Great Bssin, Aug. 16, $1,900; Horn Silver, Aug. 17, $70,000; Frisco, Aug. 17, $12,596; Alice (Montana), Aug. 16, $6,000; Horn Silver, Aug. 17, $10,000; Barhee & Walker, Aug. 18, $1,869; Mayflower, Aug. 18, $4,400; Germania, Aug. 18, $3,600; Hananer, Aug. 18, $2,200; Stormont, Aug. 18, $4,550; Frisco, Aug. 20, $5,000; Hananer, Aug. 20, $2,000; Germania, Aug. 20, $1,980; Eureka, Aug. 20, $2,190; Eureka Con., Ang. 13 and 14, $9,333.38; Christy, Aug. 17, $2,230; Northern Belle, Aug. 15, $5,939.75; Ontario, Aug. 12, $49,836 58; Standard Con., Aug. 15, $24,322.89; Bodie Con., Ang. 22, $7,376; Christy, Aug. 20, $1,733; Northern Belle, Aug. 18, $5,697.13; Star, Ang. 15, $2,551.37; Bullion, of Paradise, Aug. 16, $1,243; War Eagle (Idaho), Aug. 17, $2,945; Buffalo, Aug. 17, $3,206; Christy, Aug. 23, $2,111.

New Incorporations.

The following compauies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

ARRON M. Co.—Aug. 20. Location: Tucson. Capital, $1,000,000, in 10,000 shares. Directors—D. C. Brown, O. Lord, J. C. Todd, O. Emlay and S. R. Page.

PACIFIC COAST M. & M. Co.—Aug. 24. Object: Buying, selling and working of mines bearing precious metals in California, Nevada, Utah, Montana, Idaho and Arizona, and to acquire mill sites, water richts and real estate in said States and Territories, besides carrying on the general business of mining and milling. Capital, $10,000,000, in 100,000 shares. Trustees—G. D. Crocker, J. P. M. Perham and John P. Kelley.

SAYS the San Lnis Ohispo *Mirror:* "There is an almost inexhaustible quantity of chrome ore to he mined in this county. This industry is lying idle, and hut little or no mining being done, for tbe simple fact that the price paid for chrome ore delivered at the depot in San Luis Ohispo does not pay."

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

DOWNS.—*Dispatch*, Aug. 20: The Downs mine at Volcano is being retimbered, and a new shaft is to be sunk. The mill is lying temporarily idle, owing to the scarcity of water. A cupply of water cannot probably be had before Octoher or November.

A CONTRACT has been let to Louis Longtime to sink the Golden Gate mine at Volcano, belonging to Moyle & Chequette, 120 ft deeper, which work was commenced on Thursday of last week. The contract price for doing the work, we understand, to be $12 per ft. The mine is now down about 375 ft. The Forgus, or old Gillick mine, just below Volcano, owned by Moyle & Chequetto, closed down last week for the purpose, we are told, of letting a contract to sink the shaft 150 ft deeper. The mine is about 230 ft deep. Mr. Jas. Morgan is still prospecting his claim on Hunt's gulch, and we are told the prospect for a rich and permanent lead is good. Mr. Stephen Moyle's mine, near the Morgan mine, on Hunt's gulch, is being prospected in earnest, under the supervision of Mr. William Doyle. They are working both day and night. Mr Jas. Meehan purchased the hoisting works of the Yellow Jacket mine, near Drytown, and has teams engaged in removing it to the Volunteer mine, near Jackson, of which he is the owner. Ground has been broken for the sito of a new mill at the Pacific mine at Plymouth, which will be built as soon as possible. The shaft is now down nearly 900 ft. Thirty-six tons of rock recently taken from the Soto mine and crushed at the Pioneer mill, in the Pioneer district, yielded a little over $30 per ton.

BUTTE.

QUARTZ MILL BURNED.—*Mercury*, Aug. 20: The Union mill and hoisting works, near Forbestown, were burned to the ground last Thursday about 1 P. M. The property has been lying idle for nearly 6 months, and there is no doubt but that some one set it on fire, although there is no clue to the parties. The property is owned by a San Jose company. The loss is estimated at $2,500; partially insured. Work has been commenced on the upper shaft of the Treasure Box mine. Major McLaughlin has purchased the interest of G. W. Cummings in the Big Bend property.

CALAVERAS.

RICH GRAVEL.—*Chronicle*, Aug. 20: A large body of rich gravel has been struck in the Corral Flat mine, near town. We were shown some prospects the other day which, to say the least, were simply enormous. Work on the mill is progressing rapidly, and everything in and about the mine is in first-class order. There is not the least doubt but that the Corral Flat mine will prove a permanent paying property.

GLENCOE DISTRICT.—Cor. Calaveras *Chronicle:* The recent extensive operations of the Norwich mining company and the Valentine mining company on their respective properties have created quite a stir in this vicinity. A number of new dwelling houses are being erected in consequence. A large number of men are employed by the two companies. The Centennial mine, an excellent "prospect," not easily surpassed for economical working facilities, has also changed owners. This impulse to the quartz mining interest here is apparently of a more substantial character than heretofore, and if not swamped by an excess of theoretical manipulation, should prove remunerative to the capital invested.

WEST POINT.—As a mining camp, this place has always been second to none; plenty of people leave it in contempt, hut I notice they are always glad to get back here again. The annual product of gold is about the same most every year for the last 8 years. There is little or no placer mining. At the present time our gold product is mostly from the quartz, which has been worked mostly along the surface to different depths, few exceeding 100 ft, and not even that if water was struck. There are a few mines being worked successfully by capital, namely: The Champion mine, 700 ft deep; Henry mine, 114 ft; Jacobs' mine, 100 ft deep; Florida mine, 130 ft; Billy Williams' mine, 130 ft; Walter Barnes' mine, 117 ft. There are also a number of other mines that would wish to be worked providing they were in the hands of those that could work them, namely: The Lone Star, Riverside, Carlton, Constitution, Anna, Woodhouse, Granite, Bismarck, Whisky, Matrimonial, French Lodo, Pride of the West, Moruing Star, Pride of Bummerville, Scorpion, Valentine, Sacramento, Rattlesnake, New Wisconsin, Camele, Lockwood, Tom Paine and the Catarrh mines, all of which I can recommend as being first-class mines for investment. The rock that has been milled from each and all of the above mines along the surface, has paid not less than $50 per ton on the average, and has even run as high as $150 per ton. So you see the reason why West Point can always keep up her annual product of gold. Simply because the mines are here with the gold in them. If that was not the case, our ranchers' fences would wither, dry up and blow away next winter.

DEL NORTE.

BEACH MINES.—Del Norte *Record*, Aug. 20: Mr. Lockhart, who has purchased a portion of J. Wenger's ranch, about 2 miles below town, for the purpose of beach or black sand mining, arrived from San Francisco by the steamer of Sunday last, with all the necessary machinery for commencing work. He has a 15-horse power engine for raising water, and we learn will run 0 machines of a new pattern, and from all we can learn, are a great improvement on the machines heretofore used in black sand mining. Should this enterprise prove successful, and there can hardly be a doubt in the matter, we shall expect to soon see other companies following in the wake of this, and our beach worked for miles above and below Crescent City. Although the ground secured by Mr. Lockhart is called a beach mine, still it is a portion of the farm owned by J. Wenger, and is some little distance from high-water mark, there being other and probably richer claims between this one and the beach. We hope the gentleman will make a success of this enterprise, and being an old hand at the "bellows," and having prospected this claim thoroughly before making the purchase, we have no doubt that he will make it a paying investment.

BALD HILLS QUARTZ MINE.—The work in the tunnel on this mine is progressing finely. It's the opinion of all who have examined it that a few feet farther in the east drift will tap the main ledge. If perseverance deserves success, then the owners of this mine deserve to be amply remunerated for their labor in developing it. We expect to chronicle a rich strike in a few days.

EL DORADO.

BIG SLUICING OPERATION.—*Mountain Democrat*, Aug. 20: The E. D. W. & D. G. M. Co. are making arrangements for working the tailings in Big Spanish ravine, for which purpose they have ordered of the Blair Bros. lumber for 100 flume boxes, which are to be 3 ft in width and 3 ft in depth.

RICH GRAVEL.—Henry Edner and associates, in their mine near Brownsville, have struck a large and rich deposit of gold-bearing gravel. Last week, as a result of 10 days piping by two hands, they cleaned up $1,020.

DAVIS.—Georgetown *Gazette*, Aug. 18: Parties have made all preparations to immediately start up the noted Davis mine at Spanish dry diggings. It is to be worked by hydraulic process.

HUMBOLDT.

BEACH MINING.—Eureka *Standard*, Aug. 13: The Fancher gold saving machine, which we mentioned a few weeks ago as operating on the beach at Little River, is reported to have proved a complete success. Mr. Fancher went below by the steamer last Sunday for the purpose, as we understand it, of having a large number of the machines constructed, to be set in operation at various points along the coast. We believe one is to be set under the

sluice at Ossagan. Numerous intangible rumors are floating around of projected mining enterprises that are a sure indication that the importance of our mines is beginning to awaken and fix the attention of the public.

MARIPOSA.

NEW PLACER DIGGINGS.—*Gazette*, Aug. 20: It is reported on good authority, that rich placer mines have been discovered on Kentucky ranch, between Sherlock's creek and Lyoo's gulch, and a number of claims have already been located

SILVER STRIKE.—We are reliably informed that a rich strike in silver has been made on the extension of the silver mine a few miles below town.

MONO.

BODIE.—*Free Press*, Aug. 23: The Standard is still crosscutting east on the 1000 level, and drifting south from the west crosscut in favorable formation.

STANDARD CON.—This company extracted and shipped to the mill 1,275 tons of ore during the past week from the 800, 385, 500 and 550 levels. The amount of crude bullion received was 2,650 ounces, and the amount shipped to the company was $24,322.89.

BODIA TUNNEL.—Ore is being extracted from ledges Nos. 20 and 21, and 84 tons were sent to the mill, assaying $32 per ton.

NEVADA.

MINE SOLO.—San Juan *Times*, Aug 20: We learn that the Buckeye mine, situated between Sweetland and Birchville, has been sold to a syndicate of Sweetland men for the low sum of $3,000. This mine was originally purchased by an English company from Gen. O. Evans, John S. Stidger, Thomas Cloak and others for $200,000. After working it for many years at a great profit, under the management of Geo. D. McLean, it fell into the hands of said gentleman and Geo. E. Yates. These latter gentlemen worked the mine very profitably for many years, and have now disposed of it, as stated. We learn the new purchasers intend to work the mine by the drifting process.

PLACER.

THE NEW MEXICO.—*Herald*, Aug. 20: We understand that the Adams or New Mexico mine, near Larkin's place, on the road between Auburn and Ophir, has been bonded to responsible parties who propose sinking the shaft at least 200 ft deep, with the view of more thoroughly developing the character of the ledge. A general opinion prevails that this is good property and will pay when rightly opened.

SUSPENDED.—Placer *Times*, Aug 18: Most of the men working in the Baker mine were discharged Thursday evening of last week, work in that mine being suspended for the season. A few men were kept to make a final clean-up in the tunnel and in the canyon.

PLUMAS.

BLACK HAWK QUARTZ.—Plumas *National*, Aug. 20: The new quartz mill on Black Hawk, owned by Lathrop & Co., is running steadily and with good results. The rock is low grade, yielding about $4 per ton, but the ledges are large and easily worked, and we are told that $4 rock can be made to pay a fair profit. Considerable quantities of sulphurets are being saved, containing some gold. This Co. do almost all their own work, and are taking the slow but sure plan

GOOD QUARTZ.—Mr. J. B. Bachelder was in town on Tuesday, and gave us some specimens from a ledge which he has recently opened on the mountain above Crescent. Judging by the specimens shown us, he has a fine piece of property. He says he has from two to five ft of quartz, and thinks it will pay at the rate of $25 per ton. He will soon have a mill at work on it, and should make a fortune out of his strike. "Bach" is a very successful prospector, and finds more quartz mines than anybody, but he has had bad luck in working them heretofore.

JAMISON.—The City Enterprise Co. have stopped sinking and gone to drifting. The shaft is down 270 ft, and they have a drift in, to the west, about 30 or 40 ft. What will be accomplished is hard to tell. They have very little water to contend with in the drift, as the water which comes into the shaft comes from about 60 ft above the bottom. The stream is becoming weaker all the time, and there is not more than enough to keep the pump going, and they run the pump as slow as possible.

CONCENTRATORS.—Greenville *Bulletin*, Aug. 17: Mr. Savercool reports that about the 1st of Sept. work will begin on putting up Frue ore concentrators at the Savercool mine.

SOUTHERN EUREKA.—A pump is now in place that will return water which has already passed through the battery. After being allowed to stand in a large tank and settle, the water can be used again and again. With this arrangement it is regarded as certain that the mill can be kept running steadily up to its full capacity.

CORBIN & CO., ELIZABETHTOWN.—A new shaft is now completed above the one lately used; this will very much shorten the distance over which the dirt must be hauled in the mine; a large dump is made at the new shaft, the washing is done with a pipe—this makes the work much quicker. The drift from the old shaft into Betsey gulch has already reached pay dirt and some gold has been taken out.

A NUGGET.—Mr. Bell has a very fine specimen of quartz taken from the Bell mine, Elizabethtown; it is shaped like a child's cradle, measures 3½ inches long, 2 inches wide, and 2 inches deep, and weighs 25 ounces, gross weight. The head of the cradle is interlaced with gold in a beautiful manner, through the body of the cradle the gold is veined like the lines in moss agate, the amount of gold in the piece is valued at $200. This specimen ought to be placed in some public cabinet. Mr. Bell intends to have it on exhibition at the Greenville fair. Many large pieces of gold have been taken out on the ground now owned by Corbin & Co., by Mr. Bell and others. Howard Corbin lately found one piece on the dump worth $105; from one washing on the dump he took $665. Mr. Bell, on his place, next to Corbin & Co., took out one piece worth $700 and another worth $1,700. Mr. Mills, just below them, is pushing his work along as fast as men and money can do it. The whole region has hitherto only been scratched on the surface, and yet hundreds of thousands of dollars have been taken out. Capital and skill are now united for its development.

SIERRA.

SOLD.—*Mountain Messenger*, Aug. 20: Busch's quartz and gravel mine, Loganville, has been sold for $26,000, the stockholders have gone for their coin to San Francisco.

THE prospect in very favorable for good pay at the Dutch Co.'s gravel mine, at Loganville.

P. WOLFORD was down from American Hill mine this week, and reports the boys putting everything in order for next season's work.

ANOTHER GOLD CHANNEL.—Heskel Peak is in heavy washed blue quartz gravel, just the same as that of the Bald Mountain extension, with gold in every pan prospected. The main tunnel is supposed to be from 15 to 20 ft above the bedrock. Still more cheering news comes from northern Sierra. The Bonanza gravel mining company, Howland Flat, is reported to have found the main channel so unfortunately lost soon after the recent purchase by Cornish capitalists, and the lead is as rich as ever.

TUOLUMNE.

BRIGHT.—Tuolumne *Independent*, Aug. 20: Prospects are bright at the Santa Maria mine. A shaft 45 ft deep shows a vein one ft thick, which, at the top, was a mere thread, having gradually widened as they went down. Rock in the bottom yields $100 per ton. They are troubled with water, and will put in pumping machinery. The ore is broken by two stamps, and ground in two large arastras. Messrs. Howland & Neal are the owners of the mine. On the Garfield mine, located about six miles from Groveland, owned by Messrs. Schulz & Wenzel, of Sonora, the new mill is completed, and the flume to the river nearly finished. More expense has attended the enterprise than was expected, owing to the fact that the survey of the flume struck the river at high water mark in the estimate, and to get water in the flume, when the river fell, it was found necessary to extend it some distance further up. The mill is calculated to reduce the rock at small cost.

NEVADA.

WASHOE DISTRICT.

UTAH.—*Enterprise*, Aug. 21: During the past week the incline has been sunk and timbered 20 ft. The ground in the bottom is somewhat softer.

CON. VIRGINIA.—On the 2500 level the joint Best & Belcher crosscut has been advanced 25 ft.

CALIFORNIA.—During the week there have been 90 tons of ore extracted from the 2000 level. The joint Ophir winze on the 2500 level has been sunk and timbered 15 ft.

OPHIR.—Have completed repairs on the compressor, and have repaired the Yoho at the 1405 station.

MARIPOSA.—On the 2500 level in the joint Union Con. east winze are cutting out a sump pit at the 2600 station.

UNION CON.—On the 2700 level joint Sierra Nevada drift hole No. 3 has been extended 75 ft, and drift hole No. 4 20 ft.

SIERRA NEVADA.—East crosscut No. 1, extended 20 ft; No. 2 crosscut, drift hole from end, extended 165 ft; No. 4 crosscut has been extended 21 ft; main north lateral drift extended 27 ft.

NEW WELLS-FARGO.—The west drift on the 500 level is still passing through the same favorable looking formation reported in last week's letter.

YELLOW JACKET.—We have extended the north drift on the 3000 level 30 ft during the past week, making the present length of the same 70 ft from the switch. The quantity of water pumped continues about the same—60 inches.

CANDELARIA DISTRICT.

MOUNT DIABLO.—*True Fissure*, Aug. 20: On the 3d level the east and west ends from the north crosscut, from the bottom of winze No. 1, have been driven to total a length of 30 ft each, and show considerable low-grade ore. Winze No. 3 is down 25 ft in a favorable formation. The east drift has advanced 10 ft, and shows small streaks of high-grade ore in the face. On the 2d level the west drift shows great improvement, the face showing a 2-ft ledge of ore averaging $70. Total bullion shipments for June and July was $150,974.76.

NORTHERN BELLE.—The intermediate, between the 1st and 2d levels, continues to look well, and is yielding the usual quality of ore. The other shaft levels show no important changes. During the week about 88 tons of ore have been taken out daily. Owing to scarcity of men, caused by sickness, the company were able to run only about 30 stamps, but hope for an improvement in this respect in a few days. Bullion shipments for the week ending August 18th, $22,070.53; shipments on August account to August 18th, $42,057.00.

HOLMES.—The winze in the main tunnel has attained a depth of 40 ft. The ground in the bottom is much harder than a week since, but works very well. Operations at the lower tunnel are fast assuming a business-like appearance.

EGAN CANYON DISTRICT.

TO THE FRONT.—White Pine *News*, Aug. 20: Wednesday afternoon we paid a visit to Egan Canyon, the first in 4 or 5 months, and were agreeably surprised to find a great change for the better. In our neighboring camp all is now life and activity. About 80 men are employed in the camp—over 40 in the tunnel workings, 30 in the Jenny Lind mine, and the balance about the mill. They have already over 1,500 tons of good ore on the dumps, and are constantly increasing the quantity, so that it is pretty safe to estimate that they will have 2,500 tons by the time the mill is ready to start. At the mill in force of men is employed taking out the tanks and old timber. A great deal of work is required to put the mill in running order. A large roasting furnace will be erected, and the tanks formerly used done away with altogether. Mr. E. N. Huick, a competent workman in this line, has charge of this part of the business. An additional wing will be added to the mill. Water is being brought in through a ditch run a quarter of a mile through flats to the west. About 8 inches is already flowing. In these flats Mr. John Darnell has laid out a brick yard for the company, and is now building a kiln which will contain 150,000. These will be used in the construction of the furnace and other necessary work. The Egan company have done an immense amount of dead work—enough in fact to discourage almost any other company in the State—and it must give their superintendent, Judge O'Connor, great pleasure to feel that the time is fast approaching when his company will reap the reward of their vast outlay and patient labor. The mill will not probably be ready to crush before the middle of November or the 1st of December.

LEWIS DISTRICT.

MINERS DISCHARGED.—*Silver State*, Aug. 10: The Starr & Grove mine shut down last Monday in consequence of the disarrangement of the air compressor. One of the mills has also stopped and some 60 men are thrown out of employment. It is thought that operations will be resumed in 3 or 4 weeks, which is about as soon as the machinery can be repaired. Several men have left there for Butte, Montana. Tuesday the Chinese had a lively time among themselves. They got into a general row, in which pistols were freely used, but without effect, as none of the belligerents were killed or even seriously wounded.

ARIZONA.

GLOBE.—*Chronicle*, Aug. 13: Owing to the recent heavy rains in this section, work on some of the properties has been temporarily abandoned, but the reports received are very encouraging, and show an increasing confidence wherever development is being made.

THE MACK MORRIS.—This mine continues its regular weekly output of bullion, and it is looking fully as well, if not better, than usual. The new hoisting works are doing excellent service, and ore is being taken out in larger quantities than the mill can work with its present capacity.

SILVER NUGGET.—Supt. Lennon informs us that the east crosscut is now in 156 ft, and the face is in soft ground, intermixed with clay, quartz and porphyry. There is quite a flow of water.

WASHINGTON—Globe copper.—The shaft has reached a depth of about 60 ft, and the vein is reported to be getting more solid.

BORVA GROUP.—In a few days work will be commenced on these mines, under the supervision of Capt. S. L. Burbridge. The property is in the vicinity of the Old Dominion copper company's mines, and is owned by this company. It is probably as favorable a prospect as can be found in the district, and under proper management will develop into a valuable property.

OLD DOMINION COPPER MINES.—Reports of the latest developments on this property are very encouraging. Since connection was made with the tunnel and shaft, they have had splendid air, and work progresses more rapidly in consequence.

MINERAL CREEK.—Latest advices from this property are that a station is being put in at the bottom of the shaft, and on its completion sinking will be resumed. The direct connection of shaft and tunnel has been made, showing a 6-ft ledge with 3 ft of solid ore, and of good grade. The machinery in the mill works well, and as soon as it is possible to get the supplies to the mill, everything will be in readiness for starting up.

MINERAL HILL DISTRICT.—The Elizabeth is the north extension of the Alice mine, and has a ledge 17 ft in width. Two shafts have been sunk on the claim, one to a depth of 19 ft and the other 13 ft. The ore carries $42 in silver to the ton and averages about 40% of lead.

SAN PEDRO DISTRICT.—The recent rainfall in this section is without precedent. Everything was flooded and volumes of water dashed down the mountain sides like raging rivers, and floated through the valleys like oceans in miniature. But, the good results of this plenteous wetting down of the soil are already apparent.

YELLOW HAMMER.—The vein has widened out to four ft and now carries from 25 to 00% of copper, and assays as as high as $200 to the ton in silver.

SAMPLE MINE.—Shaft No 2 on this mine is down 22 ft, uncovering a remarkably rich vein two ft and a half in width. The ore will probably average $100 clean across the vein, and some of it has assayed as high as $17,798 90. Quite a number of prospectors are at work in the district, opening up new claims, and it has indications of a bright future. The ditch for the new stamp-mill is completed, and the machinery was expected to arrive from Tucson this week. It is the intention of the builders to have the mill in running order by the 15th of next month.

SILVER DISTRICT NOTES.—Arizona *Sentinel*, Aug. 20: A contract has been let this week to sink a 100-ft shaft on Black Rock mine. Breaking off croppings continues, with no perceptible diminution in the quality of the ore. A 100-ft contract is under way to drive a shaft in the Clip mine. There is no alteration in the excellent grade of ore from this mine. Mr. Pickenback has the contract for sinking shaft. On the 11th inst., a cloud burst, and in 15 minutes there was six ft of water where before it was dry and sound. F. P. Clark, in trying to save some sacked stone coal, was carried 50 ft down the Pacific wash, under water. He escaped with a few local bruises. The shaft on the Mamie mine is filled with water, and the miners have been temporarily transferred to Lost mine, from which they are taking some remarkable rock.

TOMBSTONE.—Cor. *Arizona Citizen*, Aug. 21: The mining news of the week does not offer anything particularly new or attractive. The Cincinatti mine last week closed down, reason not definitely known. The hoisting works lie out west of the Empire, and with the hum of machinery silenced and doors closed look particularly lonesome. From what can learn the ore upon the dump of the Girard is not of sufficiently high grade to be worked with profit when hauled to the mills and worked, though a mill on their own property would be a paying investment. The Gentle Belle, owned in San Francisco, is looking exceedingly promising. Their shaft is down 120 ft, with a five-ft ledge. As they are merely sinking a prospect shaft and following the ledge, it is not as straight as it might be, but if the prospect improves as much during the next 100 ft as it has for the last 50, I hope to be able to chronicle at least a small bonanza. The property is in the hands of well known mining men in California, and they will push matters to a successful issue if possible. Some of the mines here have experienced annoyance from bad air, owing to the cloudy days and total absence of wind. The Blue Monday had some little difficulty in this way, but Mr. Stout, the Superintendent, ordered one of the latest improved blowers from San Francisco, and it having arrived and been put in working order, there will be no trouble in future.

COLORADO.

BIG STRIKE IN THE SLIDE.—Boulder *News*, Aug. 10: This week we can say that a new impetus has been given to deep telluride mining, by the fact that the Slide mine, which for some time has been under a cloud, is now opening up the largest vein of telluride ore ever found in the mine. In the 500 level a drift was commenced which ran in apparent barren ground, but last week Mr. Pughe set some men at work to drive it still farther, feeling that the ore chute was in that direction, and, after going but a few feet, they came upon a body of ore 3 ft thick, worth to bulk over $200 per ton, with streaks of the richest ore ever taken from the mine, assaying way up into the thousands. The company is to be congratulated.

GEO. R. WILLIAMSON is still pushing developments on his Yellow Pine group, and will shortly increase his shipments of ore.

FROM Mr. Leggate, foreman in charge of the tunnel operations at Talcott by the Chicago & Colorado Co., we learn that work is being steadily carried on in two of the tunnels. The air drills are doing the work nicely, and, after running 10 or more holes, they are withdrawn and the blasts fired by electricity. This method does away with the hazard attending blasting when fuse is used.

DAKOTA.

GALENA NOTES.—Black Hills *Times*, Aug. 20: Galena has suffered nothing from the excitement in other portions of the country, and many of her people think that the stampede will end in their camp. Col. Davey is working a large force of men, taking out a large amount of ore, much of which is shipped to Omaha. Just now there are parties looking the camp over for the purpose of reporting to Eastern capitalists. If the right parties take hold of Galena there will be more than the Sitting Bull put on a paying basis in a short time. There never was a camp more neglected than Galena. Just north of Galena there is a large bed of carbonates that has been known for the past four years. It lays like ashes on top of the high hills between Galena and Crook City. The time will come when this part of the country will have the attention that it so richly deserves.

BLACK BUTTES.—The mine at the Black Buttes, or Inyan Kara, owned by Rinehart, Alden & Co., has at last developed into a veritable wonder. They have been sinking a shaft for months, and at last have struck some carbonates that go away up in the thousands. At the Portland mill they have been digging for water for their mill all summer. Two shafts were sunk about 150 ft apart to a depth of 80 ft. Water was found in each of them, and to increase the quantity a crosscut was commenced between them to cut off the water that comes down the gulch in the bedrock. In the crosscut yesterday a body of ore was encountered that is very rich as well as extensive. The ground on which the find was made belongs to Captain Foster, of Golden Gate.

NEW CAMP NOTES.—A *Times* reporter went out to West Virginia yesterday and took in the camp. There has been a vast change in the appearance of the town in a week. Quite a number of new houses have been built, and many others are being erected. Judging from the improvements the people have an abiding faith in the staying qualities of the mines. There has been a vast improvement in the working propensity of the mine owners, a great many of them having gone to work in earnest to develop their property. The Jefferson people have done some more work in their mine, which shows up a larger body of ore, as has also been done in the Richmond and Adelphia. The Deadwood Carbonate Co. have a shaft down about 18 ft. They are in capital rock that shows up well in spar and other indications. The Franklin Co. have their tunnel in 25 ft. It is showing up well in carbonates, improving every day, and with day and night shifts will soon be a bonanza. In the Wilkinson mine, in the new shaft, they have struck a two ft vein of rich ore, going down almost perpendicularly. Frank Bryant is there with a force of men at work, greatly encouraged, and promises to show up a good mine in a week or two. Stacy Hill was visited and from the location, formation, etc., we think it a promising part of the camp, that will show up better soon. It would be impossible and useless to speak of each mine in detail; they are all about alike in appearance so far as surface indications go. It takes money and muscle to develop them, and that has not been indulged in to any very alarming extent yet.

IDAHO.

HOISTING WORKS FOR BULLION MINES.—Wood River *Times*, Aug. 10: New hoisting works have just been ordered for the Mayflower and Eureka mines, of Bullion. They will be of sufficient capacity to sink 500 ft, and will be in position within 90 days.

UP DEER CREEK.—Deer creek, near this city, is attracting a great deal of attention just now. Over 200 prospectors are exploring it, and quite a number of transfers of property have taken place there lately, at figures ranging from $1,000 to $50.000. Last Friday a gentleman representing a New York company secured a half interest in the Pennsylvania, New York, Jenny, Isabelle, Republican, Annie, Keystone and Blue Jay group of claims. The consideration is stated at $10,000.

GALENA.—Frank Parmalee, the surveyor, who has just returned from a trip to Galena, says that that town and vicinity are improving rapidly. Several buildings are going up in town and the inhabitants look for lively times about next pay day. About 200 men are at work, for not less than $4 per day, and the hills are full of prospectors, charcoal burners and laborers. Prospectors are seen everywhere, and met with all the time. Mr. Moore is pushing work on the smelter, with energy. He intends to have it ready to run in 50 or 60 days. The Senate mine, which is owned by the same parties as the smelter, is opening up splendidly, and is said to be showing a valuable body of ore. On the Gladiator, Eunice and Little Chief, Mr. Johnson is working 24 men. A tunnel which will be about 600 ft long and tap the ledge at a depth of 311 ft, is being driven on the Gladiator. Three shifts were at work recently, but were driven out by foul air. Blowers have since been procured from San Francisco, however, and an increased force will now be put on.

MAMMOTH.—Idaho *World*, Aug. 16: Wilson & Whitney are developing the Mammoth, on Summit flat, on an extensive scale. Already there has been 1,000 ft of main tunnel run, with additional cross cuts and adits of over 700 ft. The ledge varies from 2½ ft in width, and carries ore worth from $40 to $100 a ton. At present there are 25 men at work. The mill, an 8-stamp, about a mile from the mine, is kept running day and night to its fullest capacity.

MONTANA.

LEXINGTON.—*Inter-Mountain*, Aug. 18: Surveys are being made for sites for 2 mills of 40 stamps each, one on either side of the hill, where it runs to a point in the forks of Missoula gulch. While we can learn definitely nothing about the sale to the French company, yet appearances indicate that the transfer will be made in a few days, and in that event the main shaft will be sunk 1,000 ft as speedily as possible, with crosscuts run to the ledge, and ore taken from the levels at every 100 ft below the surface. The process of reduction will probably be similar to that at the Moulton. That is, the ore that goes first into crushers, then on to dryers, from which it is taken to the stamps where it is pulverized, thence to the roasting furnaces, and then to pans for amalgamation.

THE BROADWAY.—Upon inquiry, we learn that the sale of the Broadway mine to the London company, by Messrs. Chas. Dahler, E. F. Johnson, W. W. Morris, S. Hurst, W. F. Sanders and P. A. Largy, is a genuine transaction, the sum paid being nearly a quarter of a million dollars. This mine is reached from Butte via Pipestone, and is 35 miles from the city, and at the south base of Highland peak. It has an incline shaft 150 ft, with numerous drifts, from which large quantities of ore have been taken. This mills about $15 per ton in gold. A 50-stamp mill will be erected. The 10-stamp mill of Morris, Johnson & Sanders goes with the mine. It is 3 miles up the river above the mine. The 18-stamp mill of Largy & Dahler, at Iron Rod, is not included in the sale. The mine is half a mile from the Jefferson river. The purchasers are Chadburn & Richardson, formerly Californians, but now residing in London.

THE BUMMER.—The ore body in the Bummer mine holds out evenly. The north wall has been struck, but no south wall has yet been found. The vein, as far as explored, is 12 ft wide. The east drift has been driven 50 ft on the ledge, and 200 tons of ore taken out, which average 80 to 90 ounces.

THE BELL.—Large quantities of ore are being taken out and stored preparatory to the erection of a smelter, a site for which has been purchased of Wm. Gwsley, on Blacktail creek. This gives Butte her fourth set of smelters.

NEW MEXICO.

THE CIMARRON.—*News and Press*, Aug. 14: Mr. I. W. England, Cbauncey Kilmer and Prof. Austin, who visited the Rebel chief, in Ute Creek district, the property of the above company, last week have not yet decided as to their future course in regard to machinery. The Howland pulverizer was wrecked by a pick point which had been fed with the ore. Messrs. England & Kilmer have returned to New York, but Prof. Austin remains to try 5 tons of ore in the Rhodo Island stamp mill, to determine if a stamp mill shall be substituted for the Howland pulverizer.

IMPORTANT MINING SALE.—Messrs. E. G. Schree and John B. Atkinson, of Kentucky, who have been here for several days, have consummated an arrangement, in connection with parties here, by which they acquire a large interest in the copper properties near the head of the Ponil, embracing the Mayflower, Monarch and Pullman lodes, and a considerable body of adjacent territory. A company is to be formed at once by these parties and the Maxwell Land Orant Co. jointly, for the immediate development of these valuable properties upon a large scale and in the most vigorous manner. Mr. Atkinson is to have the management of the copper company, and this fact is regarded by those who know him as a strong guaranty of thorough, practical and productive work. These gentlemen do not hesitate to express a high opinion of the value of these mines.

ELIZABETHTOWN.—We are at present favored with a large supply of water for gold washing, and our enterprising miners are not slow in taking the advantage of such a favorable opportunity; old sluice boxes are now in place and every day we see the boys smiling over some large clean-up of the precious yellow, that can be found in no other place in New Mexico or the United States in such paying quantities. But little is known, outside of this camp, of the amount of gold that is taken out daily from the different gulches centering to the base of the famous Old Baldy mountain. The camp is truly a field for prospectors and capital that cannot be surpassed by any other. I regard to-day the gulch mines or placers, of which here we have thousands of acres, only now in their infancy of development and cannot be worked out in the next 5 generations. There are thousands of acres of ground here that will pay from 30 to 75 cents per square yard, that water can be put upon the ground by a small outlay of capital. We deny the fact that even one gulch in this district has ever been worked out or abandoned on account of "no pay." But little attention has been paid to the development of the rich quartz lodes that make a perfect net-work centering to Old Baldy. This camp can, with the present development on quartz lodes, produce ore sufficient to run 100 stamps, that will run from $20 to $150 per ton. The ore is free milling and is easily worked, being mostly decomposed. There have been parties here this week carefully examining our quartz lodes, and went away so well satisfied that we are promised a 20-stamp mill, to be in operation by the middle of October, in close proximity to our town.

UTAH.

CHLORIDERS MAKE A CLEAN-UP.—Silver Reef *Miner*, Aug. 13: During the week our city has been enlivened by the presence of numerous chloriders from the river. These men have been working all spring and summer in getting out ore from the various mines in the vicinity of the Stormont mill, and have at least succeeded in having it worked. We are informed that the result has been highly satisfactory to the men in almost every instance. The pressure of these men contributed to materially enliven the town, and must have considerably increased the coin reserve of many of our merchants. The men have mostly returned to the scene of their labors, and we shall not expect them back until there is another "clean-up."

SILVER REEF.—A trip to the various mines during the week revealed the fact that the work of development and progress moves on with satisfactory results.

THE CHRISTY CO.—The lateral drift north in the California is being advanced rapidly to connect with the upper workings of the Maggie, and is opening up in good shape. The north-end mines of this company, embracing the Tecumsah, Silver Flat and Manhattan, are all showing as well as at any time previous.

THE BARBER & WALKER.—The ore bodies recently encountered in the north workings of the mine continue to improve.

THE STORMONT CO.—Work continues uninterrupted in the north and south drifts at the bottom of the Savage vertical shaft, both faces being in fair grade ore.

THE STORMONT.—Preparatory work has begun upon this mine by the lessees, and within a few days the pumps will be in motion. It requires about 3 weeks' time to dry the mine sufficiently to begin underground work.

THE MILLS.—The stamps of the district are all busy—with the exception of the Leeds, which is about to undergo repairs—and the steady bullion output and express report of shipments is a sufficient indication of their successful operation. We expect to be able to report a round $150,000 for this month's product, with a decided improvement in the near future.

Copper in Arizona.

Cost and Profits of Production.

Now that the eastern alarm respecting the price of copper, seeme to have subsided in a measure, and a reaction has already commenced, it is, perhaps, a fitting occasion to take up the question of the influence of our copper mines on the eupply of this metal, and ask ourselves, what the proepects are for thie Territory and especially of this district, in contrihuting to the output of the conntry, and what future and permanent effect it may have on the price of this commodity. Our statistics show that the consumption of this metal in the United States, has arisen to ahout 30,000 tons per annum, ehowing an increase of ahout 50% within the past 10 yeers. This amount is produced from our own mines exclusively and notably hy thoee of Lake Superior; The Calumet and Hecla alone yielding fully one-half this amount. In fact, we already produce more than we consume, and in epite of our high protective tariff which prevente us from importing the article, we are shipping several thousande of tons annually to Enrope, to relieve our own market; the company referred to having recently contracted to ship 4,000 tons to England, at a price considerably below the lowest quotatione for the current year. As the supply increases, they must continue to increase their shipmente in order to maintain the price, unless an increasing consnmption keeps pace with the increased eupply.

It is self evident that if it were not for our tariff, the price ruling could not he eustained, and to snetain it, we must continne to ship our eurplus abroad.

Now, let us see the effects of this state of things, on the future of the copper market, and the position of Arizona as one of the sources of enpply. It is conceded hy those who have visited thie district, that our copper mines here give promise of being important factors in the copper problem. In fact, it is acknowledged that some of our oree are richer than any found either in this or any other country. This heing the case, it is not improhahle that we may, at no dietant day, regulate in a great measure the supply and price of this metal. True it is, that tbe developments are comparatively recent, but this ie not singular when we consider how remote we have heen, and still are from the great highway whieh lead to the markets for this metal. This difficulty, however, has bsen in a measnre overcome hy the completion of the Sonthern Paoific railway the last year, and is likely to he still further overcome hy the construction of a hranch connecting ne with the main road at nd distant day.

But how does the case etand at present, as regards the cost at whicb we can turn out copper, and the effect it may have on othsr mines, producing low grade ores?

It ie said that the cost of copper from the Calumet and Hecla mines is ahout 12½ cents per pound, laid down in New York or Boston. If this is the case, the cost from several of the other Superior mines must he greater. hoth beoause the ore is still lower grade and the facilities for economical working not so great. It is therefore apparent that if any of our mines can produce copper and place it in the market at less than the cost to others, eome of the Superior minee finding it unprofitable to work, will shnt down, and this will he an offset to the increased production in other quarters; or they will endeavor to maintain the price hy sending ahroad a larger ehare of their product; meanwhile, the growing consumption will help to eustain the price, hut if it ie not sufficient, then eimulteneously with a decline comee the cessation of production in certain quarters, and many of the Snperior minee which are swelling the volume of copper production have never paid dividende (except in the form of assessments,) even though prices have averaged frequently much higher than at preeent. The conclusion is, that if pricee do not go up, some of tbese companies will go down, ae assessments are not a popular form of dividends, especially when there is a check to advance in prices, resulting from a cheaper source of supply.

Let us suppose then that some of our ores, as sbown hy various average assays of the Old Dominion mines (for we have not heen favored with the assaye of any of our other copper properties) yield 33⅓%, or one ton of copper to three tons of rock. As these ores are known to smelt freely, it ie not probahle that the cost of emelting can he greater than that of stamping and harreling the Lake Superior mineral.

The expense of mining and fuel will he somewbat greater, hut this is of small consequence, ae compared with the contrast hetween oree yielding 5%, so that we are led to the conclusion that, deepite the question of coet of mining and transportation, we have a decided advantage over our competitors. If we take 25%, ae a hasie of yield (which eeems moderate, in view of what we know ae to the Old Dominion aseaye, ae well as the ore emelted from open cute made on the eurface of these minee, eome two or three yeare since) with miner'e wagee at $4 per day, and charcoal coeting $20 to $25 per ton, it doee not eeem poeeihle that with the facilities theee minee offer for economical working, the coet of copper ought to exceed three to four cente per lb. To transport this to the Eastern market will coet, eay two and a half cente per lb., or $50 psr ton; and we ought to he ahle to lay it down there within eeven centa per lb. In fact, it would not eurprise ue to find that in the caee of oree yielding 25%, the coet would be coneiderably less than tbis, as it is difficult to see how the expense can he as great as we have estimated, for our calculation is hased on the enormous cost of $5 per ton for mining and delivering at smelters. On one ton of charcoal for one ton of copper (or four tons of ore), and $20 per ton of copper additional to cover contingencies, even this only reaches three cents per lb. as the cost of production here.

Now, it may strike eome of our friende bere, tbat it ie not in their interest, or that of the public, to puhlish sucb data, less it may affect the market unfavorahly in proportion to the publicity given to such figures. We, however, view it quite differently and ignoring, (as we are hound to do, in diecussing matters of such general and widespread intereet) the personal notions, and prejndicee of individuals, we take the hroad ground that the interests of the district are hest enheerved hy stating what appeare to he plain facts, ae far as present indications can guide us, and we firmly helieve that neither the district nor personal interests will euffer hy giving them cnrrency.

As to the effect sucb a cost of prodnction might have on the price of coppsr, we do not helieve (for the reasons already given at the outset) that even when we tnrn out here as we hope to soon, from 50 to 100 tons of copper daily, it will affect the price any more, if as mnch, as it wae affected a few weeke since, by tho operatione of copper epeculators in the East, who donhtless mede use of the remarkahle developmente here to depress the price, for their own ende, and having accomplished it, the price is returning to its normal figure, which always is, and always will he, governed hy the law of eupply and demand, except when temporarily influenced hy etock operators who always take advantage of any paseing circumetance to carry out tbeir manipulations, whether it be in merchandise or stocks.

Our friende who are interested in copper mines, need have no feare, for if we can turn out copper cheaper than cen he done elsewhere, the Leke Superior men themselves will wish to take a hand with us for their protection, as it is clear they cannot compete with ue when our smelters hegin, as they will very eoon, to turn out a fair amount of copper bullion.—*Globe Chronicle.*

Progress in Mining.

Since mining men have introduced improved machinery, there has heen a very noticeahle progress in mining. The rapidity with which numerous prospects bave been developed to extraordinary depths, and oftentimee to pay, has astonished those who are not familiar with the varions kinde of machinery used so advantageously in mining. It is a good eign when a district discards ae much as possihle the primitive methods, and adopts those which are more modern. A good power engine and hoister, with an industriove force of practical miners, will accomplish more in one week's time than the same force would do in a month hy the other method. As eoon ae a miner ie confident that hie location is upon mineral, and few will care to lahor anywhere elee, he should use every endeavor to facilitate the work hy introduoing machinery. In this no time ehould he wasted. Success in mining is attained, other things heing equal, hy adapting means to ends. It ie not so much a game of chance as in using good business judgment. The calling is just ae legitimate and is far more likely than many other branchee in which men engage. The sooner miners get over the idea that the fickle gods preside over their fate—that luck has more to do in making locatione than developing—the sooner they will he rewarded. In entirely new districts, where snow ie on the ground, or where nothing has heen learned of the succesive formations, it might be granted that fortune has something to do with it, hut it is a poor thing to he guided hy, and ie seldom attended with the success whicb is desired hy miners. The hest men in mining camps are those who go about the work legitimately, and who use mnch the same forethought which is found in any otber business. These win the highest succese soonest, and use their so-called good fortune to hetter advantage when it is secured.—*Leadville Democrat.*

Refuse at the Mints.—The skill and precision with which the operatione of the United States minte are conducted are well illustrated by the yearly decrease in the percentage of waste for which an allowance is made hy the Government. Mr. McGinnis, Chief Engineer of the Philadelphia mint, hae just had cleaned a small sewer which carriee off the drainage from the roof and hoilere. The filth which it contained wae firet dried, then pulverized, then put through the waehing machinee, and finally the gold and silver were removed from it hy mercury. The amount of bullion thue recovered ie worth only $143.85, whereas when the eame eewer was cleaned, 19 yeare ago, gold and eilver waete worth $21,000 wae found in it. The precious particlee escaps from the furnace etacks, and falling upon the roof, are washed hy the rain into the eewer.

All claime of any value in Cooper district, east of Ward, were relocated the first part of the week. The locators think the railroad will come near enough to make minea in that district valuahle.

The total population of Weaverville, Trinity county, ie 1,358. Of theee there are 859 whites, five hlacka and 494 Chinese.

Tell the Story!

Yes, tell the story, and show the devil, thonght we, as we read the lateet of rnm'e doings in "our own" city:

"Sure, she hasn't as much clothes to her hack, the dear lady, as I'd take to lift a hot saucepan from the fire." This distressing condition of affairs was yesterday related to a *Call* reporter of the widow of Capt. James Jules Sanderson Jewshury, niece of the late Sir William Hamilton, of H. B. M. Consulate service. Mrs. Ann McManus, of No. 27 Minna street, the reporter's informant and landlady of the scantily-clothed widow of a British officer, made this statement, and without waiting for the reporter to recover, supplemented it with the further announcement: "Yes, and she hasn't even that, for she can't leave her hed for the want of a gown, at all." Mrs. Jewsbury, the reporter learned, had another reason for not leaving her hed, and that reason will continue sufficient to keep her there until she has recovered from the effects of a severe heating said to have been administered to her hy her brother, James Leslie, ahout a week ago.

In any considerable number of people have the same kind of an opinion regarding Leslie that Mrs. McManus has, he is indeed an unfortunate man.

"The hig hrute," remarked Mrs. McManus, in one of her calmer moments, "for him to strike and heat the poor lady, and she his own sister, just because she wanted him to pay me part of their and his children's board hill owing me, and me a one woman. 'Give me, Mr. Mac some of the money, won't you, James?' she says so gentle and ladylike. 'I'll hreak your face in,' he answered, and with that he hit her across the face, and made it as hlack as your hat.

He took the Money

And got drunk with it, as he always does, and the money helongs to her. It comes every month—$75—to her from her agent, and Leslie makes her sign the money over to him, and he spends it. Not a cent does she get, and he'd kill her if she didn't sign the paper over to him. They have been with me four months, and she a prisoner all the time, because she hasn't a dress to put on and go out with. She had a lot of heautiful dresses, hut he drank them all up, and her jewelry, too. He has three children hy a wife who committed suicide two years ago, and no wonder she did, poor soul. One of the children is in the country, and two of them here. The four of them stay in one room, he and a child in one hed, and she and a child in another hed. He has been treating her shameful ever since she came to him to take care of his children, hut the last month it got too had for anyone to stand. He'd knock her down and take hold of her ankles with hoth hands, and twist them. Oh! but he's a brute! So at last me and Bridget Whalen, another roomer in the house, complained, and the British Consul told the police officers, and now he is arrested and there is a chance for the poor lady to he protected. Won't you come up and see her?"

The reporter accepted the invitation, and found Mrs. Jewsbury in one of two single heds in a scantily furnished front room. The landlady assumed a hustling, good-natured authority that gave the invalid no opportunity to ask for explanation or the reporter to offer excuses. When Leslie's name was mentioned, his sister said, "Oh, I am sorry this disgrace has come upon him. I am afraid that when he has been given the net above he will go down very fast. I was just thinking of writing him a note and telling him not to be despondent. He never meant to do me any harm, I am sure. He is only hasty."

This speech seemed to give Mrs. McManus the keenest anguish, and it was plainly hy a great effort alone that she kept from interrupting with vehement objections. At its conclusion she eyed the speaker hopelessly for a while, and then appealing to the reporter, said: "Now, look at that, will you! Just hear her talk! He's hasty, is he? And he ain't down to the hottom of the hill yet, eh? Look here, will you," and, notwithstanding a feehle resistance, the landlady had the sister's left arm hared and tenderly held it up for inspection. The arm was shockingly hruised and discolored from the shoulder to the wrist.

"That's only where he twisted her arm when she dared to say something about his doing something for his children," said Mrs. McManus, evidently greatly relieved that she had shown the reporter what brother James' thoughtless haste resulted in.

Mrs. Jewshury is a woman less than 30 years of age, and was undoubtedly a very heautiful woman hefore she endured the suffering she brought upon herself when, with intended kindness, she came to her widowed brother to take care of his children. She speaks like a woman of refinement and culture, but appears to be

Utterly Broken in Spirit

By her disheartening situation. She was born in Scotland, she says, married an officer in the British army, and as a young widow went to live with her uncle, Sir William Hamilton, British Consul at Boulogne-sur-Mer, France. "Mamma," she said, "wanted me to be with her brother, dear Uncle William, in his old age. I was with him only six months, the first time, when I was recalled to Scotland hy a cablegram, and went home to see my mother and sister die. Six months after I returned to Uncle William he died, on his 88th hirthday. Seven of my family and my husband's family died within two years, and so I came to Canada here. I found him very much changed, though. I expect some money in addition to my annuity, with which he promised to go into business. He is hasty, that is all, and changed some, hut he never meant me any harm."

"No harrun, except to drive you to Lone Mountain, poor dear," said Mrs. McManus quickly, to drown the sound of the excuses for brother James.

James Leslie was visited in the City Prison, and found to be, like most prisoners, tearfully unable to understand why he should he arrested, of all people. "I chiefly regret my confinement here hecause my sister is in very poor health and requires constant attention. I have not been in business lately, owing to my anxiety for her health, which has kept me close by her side. She is expecting from her husband's estate £375 sterling, with which I intended to go into business. Her income from investments left to her by her husband is £15 a month.

Leslie is a plain, rather pleasant-looking, middle-aged man, whoee wife, a few months before his sister'e arrival, was found hanging lifeless to a gas fixture in her room on Mission street. He is a nephew of Sir William Pemherton. He was found guilty of two charges of aesault and hattery, on one of which he was fined $5, and on the other was sent to the House of Correction for three months.

"Lateral Support" in Mines.—The Supreme Court hes affirmed the decision of the lower court in the case of W. C. Hendricke againet the Spring Valley Mining and Irrigating Company. Plaintiff and defendant owned adjoining mining claims in Butte county. The claims were what are known as "deep diggings," and such as are worked by the hydraulic process. In mining ite own ground the defendant washed away the gravel to points where the hank was deep, and the result was that it caved; and in doing eo a portion of the surface of the plaintiffe claim gave way and fell on the ground of the defendant. Thie portion contained a emall amount of gold-hearing gravel, hut the value of the gold extracted therefrom was much lees than the cost of extracting it. Some time after large portione of the surface of plaintiff's claim caved and fell upon the adjoining ground of the defendant. All the caving wae caused hy the mining done by the defendent. The queetion in the case wae whether the doctrine of lateral eupport appliee to casee like this. The Snpreme Court saye in its decision: "We think not. To apply the doctrine contended for hy the appellant to gronnd of this character would to a great extent defeat the very purpoee for which it was located. Defendant would he liahle for the amount of gold taken from the gravel that fell from the plaintiff'a claim hut for the fact that its value was lesa than the cost of extracting it."

Silk Exhibits at the Mechanics' Fair.

In view of tbe new life whicb eilk culture ie assuming in tbis State, and it ie worthy of note that the exhihits of silk, winding appliances and silk products are very rich in this year'e Mechanics' fair. First are the handsome and well-filled casee of Joseph Neumann, a pioneer in California eilk culture and manufacture. His position is on the main floor, near the musiciane' stand. His exhibit ie an unusually large one, occupying one elevated glass stand and a glass case. Both in variety and quantity of cocoons and raw silk, the dieplay ie remarkably good, and reflecte great credit upon the exhibitor for the care, perseverance and expense he has gone to in endavoring to build up this industry in California. Several pyramids representing the silkworms spinning their cocoons are ehown, hesides over 20 cases of cocoons, all raised in this State. These latter represent many different varieties, from the smallest up to the full size of the French Annual. The specimene of raw silk exhibited are very fine, and estahlish, ae clearly as it is possihle to do, in tbat the silk manufactured from the worm bred in thie State is, in its raw condition, equal to that of any country in the world. Mr. Neumann, through hie own unaided individual efforts, has done much to ostahlish this, and he is deserving of every praise for it. Interspersed among his exhibite are the different medals (nine in all) that have been awarded his exhihits in other placee and countries, the whole constituting a well-arranged display of silkworm productions and the marks of appreciation extended toward them hy others.

The two other exhihits of silk may be fonnd adjoining each other in tbe east gallery. One of these is hy the California Silk Culture Association, which is the name ohosen hy a large number of energetic and puhlic-spirited ladies for their society, which is now the most active agency in awaking new interest in eilk culture. The society hes already enlisted a large number of ladies in different parts of the State in sericultnral experiments, and the resnlts thns far obtained are very encouraging. The exhibit of the Silk Culture Association is very comprehensive. It contains first, a collection of wild silkworm moths from India and China, as also a numher of the ordinary kinds. Tbey are the property of Dr. Behr, of this city. In cocoons, the finest exhihit ie that made hy Mrs. S. A. Sellers, of Antioch. It ie made under the auspices of the association, and comprises the following different varieties, all of California growth: French Annual, Japanese Annual and Bivoltines. The French Annual cocoone are considered the best, for manufacture, heing also the largeet. The Bivoltines, or, as the name eignifies, hi-annnals, are tbe smellest varieties. In addition to the cocoons, Mrs. Sellers exhibits a lot in different colore of reeled raw and floss silk, together with a numher of eilkworm eggs and moths. The display is a very complete one, occupying one entire large case, and would do credit to any exhihition in the world. The other exhibitors in the stall of the California Silk Culture Association are Mrs. Keeney and Mrs. McLean, of San Rafael, Mrs. Dodson, of Red Bluff, Mrs. James G. Whitney, San Francisco, Mrs. F. Dennis, Sutter Creek, and Mr. Bettleheim, of Antioch. The newly invented frame for silkworme to wind cocoons, the idea of Felix Gillett, of Nevada City, ie worthy of notice, as are two very fine specimene of the California wild silkworm moth. It is stated that a very similar kind of moth to the California one is found in some portions of Tartary, and that the psople make from it a rough silk cloth that gives unending wear. Garments made from it have been handed down hy tbe Tartars from generation to generation, from time immemorial. Mrs. T. H. Hittell, the indefatigahle Secretary of the California Silk Culture Association, has some interesting old German illustrated worke treating of the eilkworm and silk culture, and Miss Mary Wackenreuder, of San Bruno, hae a very pretty imitation in wax of the mulherry tree, and the silkworms feeding. The operation of reeling the eilk from the cocoone may he seen on Wednesday and Saturday afternoons.

One of the most striking displaye in the pavilion is that of the California Silk Manufacturing Co., of this city. It consists of a large upright glass case filled with eilk manufactures, chiefly spool silk. There is an architectural method of showing this spool silk, which shows much skill, and presents a charming effect. An excellent imitation of the State Capitol, at Sacramento, and the stepe approaching thereto, and the lawns approaching it are all made of silk manufacture. The hnilding is wholly of spools of selected colors, and embracing all kiuds of silk thread. This exhibit should be eought for hy all who visit the fair.

Silver Reef's hullion ehipmente are gradually increasing, and we may soon expect to eee dividende resumed in many of the propertiee which suspended early in the epring hy reason of the striking miners. There is no reaeon why the Reef should not again occupy the prond poeition it held a year ago as one of the leading hullion producing campe on the Pacific coeet. Silver eandetonee have certainly not lost their grit and grip.

The grose yield of the Ontario up to the month of Auguet, wae $8,750,358. It hae paid 65 dividends and is good for aa many more. In fact the great mine ie said to he only in ite infancy.

Grazing throughout Arizona is the finest ever known.

Assaying Argentiferous Galena.

Take ont tho front grate of an ordinary cooking stove with a good grate space and draft, and pnt in a piece of thin earthen drain pipe about nine inches in length and three inches inside diameter, supporting it on hits of brick so that it rests about two and a half or three inches above the grate. The tnbe should be heated in an oven or otherwise as hot as possible before settiag it, so that when a fire is built under and around it, it will not enap or hreak into fragments. Build tho fire so that tho air may pass through the tnbo from front to hack and escape through the fire without danger of the coals falling into it. Let the fire gradually increase until the greater part of the tube is at a bright red heat, the front of the tnbe being loosely stopped with a piece of fire-brick trimmed to fit.

Weigh ont on apothecary's balance ahont one-tenth of an ounce of the ore reduced to a fine powder hy grinding it in a mortar; also, two separate lots of one-half ounce each of granulated lead free from silver. Mix one part of the lead with the ore in the bottom of a small scorifier; cover the mixture with the rest of the lead, put the scorifier into the extemporized muffle. Close the month of the muffle until the load has melted, then partly open it to let the air llow in. If the muffle is hot enongh the lead will soon hegin to ecorify the liquefied lithargo formed collecting as a ring around the sides of the vessel and gradnally increasing in quantity, nntil the whole surface of the melted metal is covered. It is well to add to the contents of the scorifier two or three pieces of borax glass (borax that has been melted in a crucible and poured out on a piece of iron to cool) the size of peas, if any of the gangue of the powdered ore remains on the top of the metal and is not slagged and absorbed hy the litharge. As soon as the ring of slag closes over the metal, remove the scorifier; let it get cold, then hreak it, and hy pounding separate the slag from the button of metal.

Pnt a dry hone-ash cupel, weighing ahont the same as tho hntton of metal obtained from the scorification, in the muffle, let it get red-hot, then drop in the clean hntton and close the muffle nntil the metal is liquefied, then open it partly.

Lead nnder saoh treatment slags off into litharge, the latter carrying with it all the hase metals and impurities. It is absorbed almost as soon as formed (if the muffle is properly heated) into the porous houe-ash cupel. Tho button gradnally decreases in size, and as it gets small it must be watched, so that when the last of the lead passes off into slag, and the silver (if any is present) hrightens or assumes the color or luster of the pure metal, the cupel may be removed to avoid loss hy volatilization. If the ore contained any silver a small head of that metal will he found in the cupel; if none, the cupel will he empty. Sometimes, in poor ores, the head will he almost microscopic, so that the cupel must he carefnlly examined before setting aside. Weigh the head, if fonnd, on a fine balance, and multiply the weight in grains hy 291,600, tho result being grains of silver (with possihly a little gold) in a ton of ore. Error may arise from the presence of silver in the test lead, so that it is always hest to test it for that metal (hy scorification and cupellation, as above). If it is fonnd to contain silver, and a purer sample cannot he readily procured, determine hy dnplicate tests as accnrately as possible the amonnt present, and make proper allowance for this in calculating other assays in which the lead is used.

Good scorifiers and cupels can be obtained from any dealer in chemical apparatus, etc. In some instances a large French olay or even Hessian cruoible, with a hole knocked in the hottom, can he made to serve as a good muffle for such tests, instead of the clay pipe. In this case the side of the orucible becomes the bottom of the muffle, and if a little dry sand or bone-ash is spread over it, it can be made level enough to support the scorifier without tipping.

Under favorable conditions such tests can he made in an hour or an hour and a half.

Mining a Stable Industry.—Mining is as solid, suhstantial and profitahle an indnstry as any in the world. Year after year, as appliances for the cheap reduction of ores get nearer perfection, mining becomes a more stable interest, and investments in that line become more certain of good retnrns. The wonderful snccesses that crowned the efforts of so many of the placer miners of California acted against the qnartz mining interests of the coast. The rich pay dirt of Tuolumne county, Cal., with its $50 to $1,000 a cart load, was something that captivated the puhlio fancy, and it could not get down to such a thing as sinking hnndreds of feet throngh hard rock after a possihility. In the "early days" a string of sluice hoxes, a rocker, or a pan, was ahout all the plant needed; quartz mining reqnired expensive machinery. The puhlic did not care for any of it. Gradually, however, the industry has worked its way along, till it stands among the first in magnitnde and profit. Quartz mining, great as it has hecome, is still in its early stages of development, and every year will add to the volume of money invested in it, and increase the profits accruing from it.

The Virginia *Chronicle* denies a rumor that the force of miners in the Bonanza mines is to be increased. It says there is nothing underground to warrant their working more than they have at present.

Useful Information.

How to Detect Imitation Diamonds.

Imitation diamonds, usually known as "paste diamonds," are simply glass of great purity. The Providence *Journal*, which is published in the immediate vioinity of the locality where most of the cheap jewelry of the country is produced, furnishes the following information, which may he useful to the unskilled, who may have occasion to purchase cheap diamond jewelry:

"When imitation diamonds were introduced, it was found that to cut glass precisely like a diamond did not produce the sparkle characteristio of the diamond, therefore to secure this the flat surface on the top of the diamond was made pyramidal on the imitation, and, of course, ended in a point. By certain laws of light this pyramidal snrmounting of the glass provided for the required distribution of ray snrface to produce the diamond sparkle, or something akin to it. A real diamond is never cut with the pointed apex, and hence it was possihle always to distinguish the real from the epurious. But after a time the huying pnhlio learned this little circumstance ahont the cutting process, and other means were resorted to. The glass was cut precisely like the diamond, and the sparkle was given to or provided for it hy a coating of white foil appliod to the lower side of the glass. The setting of many diamonds is arranged in such a way that the bnyer may see the nnder side of the gem. This was overcome by arranging the setting so as to prevent inspection of this kind, which could not be done nnless the stone was dismounted, if we may use that term.

"With these facts known to the huyer of diamonds, he need not be deceived except in the latter case, where the setting hides the under snrface, and if he has any douht ahout that he can let it alone. But the object of imitation diamonds is not to deceive buyers; if it was they would not he offered for two dollars. No one, however deficient in diamond criticism, need be deceived in buying diamonds. No dealer of any repute ever attempts to sell imitation for real diamonds. No reputable man ever thought of it. His reputation and occnpation would soon be gone. There are very few persons who huy trinkets who do not test their wares at other than the huying place, particularly if the gem is a costly one, and it is certain no one was ever presented with jewelry of presumahle worth who did not set out at once to learn its purity and valne, and very disappointing it has douhtless heen to find in some cases that the gold or diamond was only hrass or glass."

How to Tell a Good Potato.

Everyone knows there is a great difference in the quality of potatoes, and any person can tell a good from a poor one after it is cooked; hut how to distinguish them in the sack is a secret to the great majority of people, and one well worth knowing. To distinguish a good from a poor potato, take a sound one, pay no attention to its outward appearance, hut divide it into two parts with a sharp knife, and examine the exposed inner surfaces. If there is so much water or "juice" that a slight pressure would seemingly cause it to fall off in drops, you may he assured that it will he "soggy" after it is hoiled. That is evidence of a poor potato—and don't yon huy it.

The following are the requisite qualities of a good potato: When cut in two the color should he yellowish white; if it is a deep yellow it will not cook well. There must be a considerahle amonnt of moisture, though not enough to collect in drops and fall off, even with moderate pressure. Rnh the two pieces together and, if it is good, a white froth will appear aronnd the edges and also upon the two snrfaces, after they are separated. This signifies the presence of a proper quantity of starch. The more froth the more starch, and consequently the hetter the potato; while the less there is the poorer it will cook. The qnantity of the starchy element may also he judged hy the more or less ready adherence of the two parts. If the adherence is sufficient for one piece to hold the other up, that fact is evidence of a good article. These are the experiments nsually made hy experts when huying potatoes, and are the hest tests that can he given short of hoiling; hut even they are hy no means infallihle.

Wool Oil.—The term "wool oil" carries little meaning to those outside the business. Before wool is run throngh the carding and spinning machines, it mnst he well oiled in order to hold the fiber and prevent its flying ahout. For this purpose an oil must he used that can easily he removed after the operation, and that will do no injury to the wool. It must therefore contain no acid. Many individuals have heen for years experimenting to obtain just the kind of oil needed, hut we are not aware that anyone has yet produced an article that gives nniversal satisfaction.

Bands of Music are forhidden to play on most of the large iron hridges of the world. A constant succession of sound-waves, especially such as come from the playing of a good hand, will excite the wire vihrations. At first the vihrations are very slight, hut they will increase as the sound-waves continue to come.

Animal Vaccination.

Prof. Pasteur recently gave an address in London, Eng., on animal vaccination, in which he reviewed his experimeats and researches in that direction. This suhject appears to be creating deep interest in Englaad and on the continent, and is certainly one of the highest importance to all interested in any business which involves the risk of animal life, hecause of the prospect which it affords of reducing cattle diseases to a minimum.

After the conclusion of the address, Sir John Paget, in the name the of Medical Congress, hefore whom it had heen delivered, thanked the professor for his effort and for his great work of doing for the lower animals what Jenner had done for the human race. "France," says Prof. Pasteur, "loses every year hy splenic fever animals to the value of $4,000,000." In the course of his remarks he said: "Fifty sheep were placed at my disposal, of which 20 were vacciaated. A fortnight afterwards 50 sheep were inoculated with the most virulent athracoid microhe. The 25 vaccinated sheep resisted the infection. The 25 nnvaccinated died of splenic fever within 50 hours. Since that time my energies were taxed to meet the demands of farmers for snpplies of this vaccine. In the space of 25 days we have vaccinated in the departments surrounding Paris more than 20,000 sheep and a large nnmher of cattle and horses."

Smoky Chimneys.—Who is there that has not, time and agaio, heen botherod, almost to death, by volnmes of smoke pouring out of the wrong end of his chimney or stove-pipe? In this connection it would he well to heed the advice of Dr. Franklin: "Should the chimoey of a house, for want of previous cooideration, he fouod to smoke, no afterthought will compensate this want of forethought. And he who has hegun in this manoer can only expect to have the ill-construction of a chimney to comhat with, which is ofteo impossihle to alter." There is no greater mistake than supposing that smoky chimneys were nnknown hefore our times, and that the unsightly contrivances on their tops—frequeotly ahortive—are the notahle inventions of the present day. From the first iotroduction of flues, smoky chimneys have heen always proverbial nuisances, although from ohvious causes such complaiots were infinitely fewer than they are now. Smoke often returns into a room of a morning when the fire is first lighted, not from a fault of the chimney, hut from the cold air in the flue, which prevents the smoke gettiog up till the chimoey is warmed, and the air in it rarefied.

Good Health.

Medical Advice.

The St. Louis *Globe-Democrat* happily hits off "the suggestions of the doctors" as to the best means of avoiding sunstroke:

AS TO DRINKING.

Dr. Smith's Advice.	*Dr. Brown's Advice.*
Stick to cold drinks; they keep the skin moist.	Avoid cold drinks; they suppress perspiration.
Iced tea is especially wholesome.	Iced tea is dangerous.
Milk is heating.	Milk is a delightful summer drink.
Beer is a natural summer laxative.	Beer is bad in summer.
The light wines are heating.	The light wines are cooling.

AS TO EATING.

Dr. Smith's Advice.	*Dr. Brown's Advice.*
Eat all the meat you can.	Avoid meats.
Eat all the vegetables you can.	Vegetables are dangerous.
Avoid pastry as you would death.	Pastry is good summer food.

AS TO WEARING.

Dr. Bliss' View.	*Dr. Barnes' Assurance.*
Stick to your flannels.	The wearing of flannels is a fatal delusion.
Woolen clothing should be worn in sufficient quantities to keep a uniform temperature.	Wear only linen and light fabrics.

THE HEAT.

Dr. Hammond's Advice.	*Dr. Baird's Injunction.*
Never mind the sun while you have a wet cabbage leaf in your hat.	Keep out of the sun; otherwise you will encounter great danger.

The Cause of Somnambulism.

Various theories have heen putforth to account for the phenomenal state known as "somnamhulism." A writer in the *Phrenological Journal* says that it is due to incomplete sleep. That in complete sleep the hrain is in a quiescent state as a whole, hut in somnamhulism it is a sleep only in parts, and in other parts active or awake. Dr. W. A. Hammond, a medical writer of some note, says that somnamhulism is "analogous to sleep." He says of a person asleep: "If this quiescent state of the hrain is accompanied, as it often is with nervous and excitahle persons, hy an exalted condition of the spinal cord, we have the higher order of somnamhulistic phenomena produced, such as walking or the performance of complex and apparently systematic movements," etc.

The *Journal* differs with the Doctor. He says that if the brain is at rest and the spinal cord active, it would he as if the hrain of the person was entirely removed, so far as the actions performed are concerned. If the hrain is removed, or what is equivalent, perfectly quiescent, there is nothing to cause aotion in the spinal cord, which is not self-acting.

The editor states his opinion of the cause of the phenomena substantially as follows: The hrain, in somnamhulism, is only a sleep *in part*—a portion of the hrain is asleep and another portion is awake, and in a state of intense activity. From these exoited portions of the brain the stimuli pass to the motor mechanism of the spinal oord, through which, in their turn, the muscles are set in action, which produce the motions and acts of the somnambulist.

Enough is known of the mechanism and working of the hrain, especially in the singular peculiarities in its hlood supply, to render it quite certain that the phenomenal condition referred to, of a partial quiescence of the hrain, is a possihle thing.

May we not also infer that all dreaming is due to the same cause. In perfect sleep there is no dreaming, no action of the muscles whatever.

Hygienic Value of Mirth.

Mirth has an hygienic value that can hardly he overrated while our social life remains what the slavery of vices and dogmas has made it. Joy has been called the sunshine of the heart, yet the same sun that calls forth the flowers of a plant is also needed to expand its leaves and ripen its fruits; and without the stimulus of exhilarating pastimes perfect bodily health is as impossihle as moral and mental vigor. And, as sure as a succession of uniform crops will exhaust the hest soil, the daily repetition of a monotonous occnpation will wear out the best man. Body and miad require an occasional change of employment, or else a liheral supply of fertilizing recreations, and this requirement is a factor whose omission often foils the arithmetic of our political economists.

To the creatures of the wilderness affliction comes generally in the form of impending danger—famine or persistent persecution; and under such circumstances the modifications of the vital process seem to operate against its long continuance; well-wishing nature sees her purpose defeated, and the vital energy flags, the sap of life runs to seed. On the same principle an existence of joyless drudgery seems to drain the springs of health, even at an age when they can draw upon the largest inner resources; hope, too often hafiled, at last withdraws her aid; the tongue may be attuned to canting hymns of consolation, hut the heart can not ho deceived, and with its sinking pulse the strength of life ehhs away. Nine-tenths of our city children are literally starving for lack of recreation; not the means of life, hnt its object civilization has defranded them of; they feel a want which hread can only aggravate, for only hunger helps them to forget the misery of *ennui*. Their pallor is the shallow hue of a cellar-plant; they would be healthier if they were happier. I would undertake to cure a sickly child with fun and rye-hread sooner than with tidhits and tedium.—*Dr. Oswald, in Popular Science Monthly.*

The Sunbeam in the Sick-Room.—Only a little glimmering, dancing ray of light, hnt on its golden wings what hlessings did it not hear. It came to the window of the room where all through the long dreary night the weary snfferer had restlessly tossed to and fro. The hired nurse had carefully closed the shutters, to exclude the light of the early morn, and availing herself of a few moments' rest, had fallen asleep in her chair. But notwithstanding all her precaution, the little sunbeam found one crack where it could peep through, and throw all its soft shimmering hrightness full npon the face of the invalid. The sick woman gave a start of glad surprise, for it had been many weary days since even one ray of the glorious sunlight had fallen npon her vision. She spread out her thin, almost transparant hands to catch the genial glow, and a faint smile passed over her emaciated face. Silently she feasted npon the golden hrightness, as it whispered to her of the great hlue arch above, and the earth with its carpet of green, awaking to new life and heanty at its tonch; forgetting her pain, she sank into a quiet slumher. And when the physician came, a smile of satisfaction wreathed his lips, as he saw the improved state of his patient. Ah! Doctor, what all yoar drugs failed to do, that little golden messenger from heaven accomplished, for it wooed sweet sleep to the eyes that hefore had refused to close.—*Phrenological Journal.*

Remedy for Poison Oak.—Dr. S. A. Brown, U. S. N., states in the *Medical Record* that he has fonnd a specific to the troublesome eruption produced hy the poison oak or poison ivy so common in our woods and along old fences. This specific he finds in hromine, which he has used with nnvarying success in at least 40 cases. He uses the drug dissolved in olive oil, cosmoline, or glycerine, in the strength of from 10 to 20 drops of hromine to the ounce of oil, and rubs the mixture gently on the affected parts three or four times a day. The bromine is so volatile that the solution should he renewed every 24 hours. The ernption never extends after the first thorough application, and it promptly disappears within 24 hours if the application is persisted in.

Tobacco Deafness.—A few days ago a Cincinnati law student suddenly found himself deprived of hearing. Calling upon an aurist, he was told that the habit of smoking cigarettes, in which he had long indulged, had occasioned an obstruction of the Eustachian tubes, ducts which lead from the throat to the ear. This is a very frequent cause of deafness in smokers. Tobacco occasions destruction of the sense of sight, of taste, and of smell, as well as of hearing, and not infrequently occasions paralysis of the whole nervous system. Why will our young men destroy their senses by its use?

MINING AND SCIENTIFIC PRESS

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Saturday Morning, August 27, 1881

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Passing Events.

Tho latest news from Washington regarding the condition of the President is very disconraging, and it seems very douhtful if he will ever recover. The people throughout the country have been extremely anxious for days past, and have watched the telegrams carefully in hopes of seeing more encouraging signs. But at this writing (Thursday) there seems small hope of his recovery.

In another column we give the account of the death of several prominent mining men, among them George Daly, well known all over the coast. It looks as if some rigorous measures ought to be immediately taken hy the Government to prevent the Apache raids in Arizona and New Mexico, and to establish a more peaceable state of affairs along our borders. The Indians do not seem to have much respect for the prowess of our soliedrs. Another General Custer is needed down that way.

An event of more than ordinary importance chronicled this week, is the inauguration of a new President of the State University. The inaugural address marks President Reid as a man with the "coursge of his opinions," and one who will maintain vigorous administration.

Mining news, as will be seen hy our summary, continues favorable from nearly all points. The hig hydraulic pump on the Comstock is performing its duty well now, and has been doing this long enough to show that it will continue to he effective. But no honanzas have yet come to light up there.

THE hydraulic pumps of the C. N. S. shaft were running at the rate of 10 strokes a minute last Saturday.

Silver from Argentiferous Copper.

Ths process of extracting silver from argsntiferous coppsr hy liquation is still employed in soms localities, although it has hssn now gsnerally snpplanted hy the cheaper and more efficisnt systsm hy the wst way. The liquation process is based on the circnmstance that when copper containing silver is alloyed with a certain proportion of lead, and afterward heated above the malting point of ths lattsr metal, hut helow the tsmperature at which coppsr entsrs into fusion, the lead hecomes liquid and drains or sweats out, carrying with it the grsater portion of ths silver, whilst impure copper remains hshind in a cavernous or spongy form.

It has heen found hy experience, according to J. Arthnr Phillips, that to conduct this operation successfully, the lead should he present on the alloy formed, in the proportion of 11 parts of that metal to three of copper, and that for every part of silver present, ahout 500 parts of lead should he employed.

In the Hartz, according to Lamhorn, hlack copper containing one-sixth per cent. of silver can he treated with advantage hy liquation; hnt when only one-eighth per cent. of this metal is present, its extraction does not pay the expenses incident to the operation.

This process is not, however, generally applicahle to the extraction of silver from ores in which that metal forms the most valuahle and important constituent; and since it has often heen described with much detail in various German and other treatises on metallurgy, we refer those who desire information on this subject to the authors in question. The prooess of liquation will he found described in the works of Villefosse, Kerl, and others.

Sand.

At the last meeting of the San Francisco Microscopical Society, Mr. Chas. H. Dsnnison read a very interesting paper on the formation, composition, uses and valne of sand. He showed 46 varieties of sands from all parts of the glohe in small vials, and the same mounted on slides for the use of the microscope. The formation he claimed was due to the aotion or various forces of watsr npon rocks, the crushing and grinding of rocks hy glaciers, then carried hy the streams to the sea, and to the effect of heat and moisture. He claimed and calls attention to the fact that rocks whsn heated and thrown into, or water thrown upon them, decrepitated, or were broken in pieces. He named a place where angular and sharp-pointed sand was found in position where it was made, and showed samples of it. The power, steam or gas that pushed the hill or rock ahove the surrsnnding hills, has escapsd through the rock and reduced it to sand. He showed hy statistics that in 30 years past ordinary sand for huilding and mannfactnring nurposes amonnted to ahont $3,000,000,000, and that all the golden sands, hydraulio and quartz gold found in California for 30 years amounted only to $1,400,000,000, so that the ordinary sand of commerce had heen the most valuahle. The action of water upon quartz sand had heen shown hy experiment, that in 60 years rolling upon a heach hy the waves, sand one-fiftieth of an inch in diameter was angular and not worn, showing not a particle of ahrasion. Mr. Davison supposed the opalized sand on the Pescadero heach had heen rolled hy the water a vast cycle of time, and mentioned a hnndred thousand years as the time it might take to wear that sand into its heautiful and perfect shape.

Our Extra Edition.

We had intended this week to publish an extra douhle sheet edition of the MINING AND SCIENTIFIC PRESS, hnt find it desirahle to puhlish more engravings which take further time for preparation, so we have to postpone the douhle sheet until next week. A feature will hs a complete catalogue of all the exhihits in the Mechanics' fair. Another will he a history and description of the wire rope cahle railroad system, which has heen so successfnl in this city. We shall of course have the usual varied mining aud metallurgical articles, several of which will he of universal interest. We shall print a very large edition of the issue of Septemher 3d.

HOW TO FIND THE NEW COMET.—An Eastern authority furnishes the following directions for finding the new comet, now ahout coming within the vision of the naked eye: Look in the northeast sky shortly hefore snnrise and see near the horizon a hright morning star, Alpha Auriga. Just helow this, to the left, see another dimmer star, Beta Auriga. Then with your opera-glass see helow Beta, and almost in a line with it and Alpha, the new comet. This comet will soon pass into the constellation of the Lynx and then into the Great Bear, when it will he hrightest. It will then pass through Virgo and disappear south of the eqnator. When nearest the sun it will also he nearest the earth, and, fortunately, the moon at that time will he absent.

THE *Lyon County Times* says there is a marked improvement in the manner in which the Sntro tnnnel has heen rnn of late.

The Chlorination Works at the Plumas National Mine.

[Written for the MINING AND SCIENTIFIC PRESS by C. H. AARON.]

It was decided to try a Brunton furnace. This is a horizontal, hrick-lined, rotating iron cylindroid, the diameter at the centsr heing greater than at the ends, and that at the fire end grsater than at the rear end. It rsvolvss npon heavy flanged rollsrs, and the motion is imparted hy traction, two of the rollers, on the ascending side, hsing connectsd hy a strong shaft, on one end of which is a worm-whssl, driven hy a screw on a transverse shaft.

This mode of driving the furnace is open to one ohjection. If, from inaccuracy in the setting, or from unequal snhsidence of the foundation, the furnace should he out of level in the direction of its length, it must he adjusted hy lessening the distance hetween the rollers at the end which requires to he raised. Bnt if one of these rollers is connected hy a shaft with one at the other end of the furnace, this adjustment cannot he made without throwing the furnace out of line with the rollers. Hence the furnace should he driven hy gearing, which is indepsndent of the rollers. In the case in question, however, no inconvenience arose from this cause.

The furnace was lined with common hricks, placed on edge, with the greater dimension transversely to the axis of the cylinder. This gave a good bevel, an important point, as the diameter of the shell was 6 ft. 8 inches in the middle zone, and the result was that none of the hricks fell out. In the end linings the hricks were placed on their sides, radially around the central opening, through which the flames from the fixed fire-hox entered, and the smoke, etc., escaped. These openings were furnished with necks, lined with fire-hricks, that at the fire end ahntting (without lap) against the cast rim of the corresponding opening in the fire-hox, whioh was of the same diameter, also lined with fire-hrick.

At first some trouhle arose from the end thrust on the transverse screw-shaft, whioh should have had a step, cast solid with the hed-plate, hut this was overcome hy a stont collar, four inches long, with two steel cupped set-screws at a right angle to each other.

The furnace was driven hy a small vertical engine, admitting of some variation of speed, hut the slowest attainahle was one revolution in three minntes, which was too fast.

The length of the furnace was 12 ft., and it would have contained ahout six tons of concentrated sulphurets from the Frue machines, hut the largest charge put in was ahout 3 tons, as it was found that the time occupied in roasting was nearly proportional to the charge, so that it was not advisahle to run the risk of a breakdown. There was no arrangement for lifting or moving the ore, other than the rotation of the furnace itself.

Uuder these conditions the roasting proceeded with extreme slowness, not averaging more than half a ton of sulphurets in 24 honrs. By inserting a wooden rod through the "peep-hole" in the wall of the transverse flue, and passing it into the rear end of the furnace, it was ascertained that the slowness of the roasting was not due to any deficiency of oxygen (air), as the end of tbe stick hurned readily in the nppor current, hut was almost extinguished when depressed into the snlphur vapor hy which the lower part of the furnace was filled.

It was also observed that when the ore near the rear end of the furnace was well roasted, as ascertained from samples taken hy means of a long spoon, there still remained, in the more capacious middle zone, a large qnantity of unroasted ore. On this account the sampling test was ahandoned, and the progress of the work was ascertained hy closing the damper (in the stack) snfficiently to cause fumes to issne from the peep-hole, when the reqnlred information was afforded hy the smell.

After several experiments it was clear that something must he done to accelerate the roasting. As matters stood it was like putting the ore into a hole in the ground, and causing the flames to pass over while stirring it. Against pntting in lifters there were two objections; firstly, it would increase the dusting; secondly, it would infringe a patent.

In order to hring the ore and the air into more intimate association, and to avoid the interposing dense cloud of sulphurous vapor, a hint was taken from the action of the reverberatory furnace, in which the air, entering hy the open working door, can he seen to pass under the flames, and directly in contact with the glowing ore. Air of equal temperature is lighter than sulphurous anhydride, consequently, heated air which passes through the fire rises to the top of the furnace, while the heavier snlphurous vapors remains, to a great extent, resting upon the ore; hnt cool air is heavier than hot sulphurous anhydride, and is transparent to radiant heat, hence, if introduced hetween the flame and the ore, it not only does not impede the action of the heat, hnt it enahles the sulphur in the ore to hurn, the hot product, sulphurous anhydride, rising, and admitting a fresh snpply of air in contact with the ore.

To attain this condition in the Brunton furnace, the lining of the necks was removed, thns enlarging the diameters of the openings. The throat lining of the firehox was modified so as to make the opening wider, and of the form of a little more than a semicircle. The firehox was also raised, so that the top of the throat shonld coincide with the top of the enlarged opening in the end of the furnaos.

This left a portion of the circular opening in the end of the furnace uncovered hy the slightly projecting neck of the firebox, forming a crescent-shaped aperture throngh which cool air, undilutsd hy the gasses and smoke of the fire, could entsr helow the flames. A piece of sheet-iron was adapted to closs this apsrture when reqnired. The resnlt was most gratifying. The time reqnired to roast a charge of ors was reduced to little more than half, and the fusl in still larger ratio.

A set of experimsntal lifters, made of sheet-iron was then put in. They were holted through the hricks to the shell of the furnace, and withstood the heat and the sulphur much hetter than was expected. They were not allowed to extend within three ft. of the rear end of the furnace, in order that not too mnch dnst might he carried out, and they were arranged in a slightly spiral manner, to screw the ore toward the fire from the helly of the furnace. This effected a still further improvement, and when the writer left the works, the furnace was roasting two tons of clean sulphurets from the Frue machines, or three tons from other concentrators, which were not so clean, in 24 hours, with a consumption of half a cord of wood to the ton.

The working capacity could prohably he douhled hy connecting the rotating furnace with a reverheratory, in which the ore could he partially roasted hy the waste heat, after which it could he pushed into the rotary furnace through the opening at the rear end, hy means of the hoe, and a suitably arranged chute.

The snlphurets of this mine contain a large qnantity of talcose matter, which cannot be separated hy washing. In consequence, it is necessary to add from 4% to 5% of salt in the roasting. Another result of this impurity is, that the nsnal manner of precipitating the gold ohtained hy the chlorination process, namely, with solution of iron protosulphate, does not answer, as the gold settles slowly and imperfectly, heing also very mnch contaminated. Hydrogen sulphide was therefore used with satisfactory results.

The cost of working the sulphurets at this mine need not exceed $10 per ton working two tons per day, and would he less with the reverheratory attachment to the furnace. The material contains from $25 to $60 in gold per ton, of which 80% is extracted. The chlorination works may therefore be called successful.

If this class of furnaces is to he used for the roasting of auriferous sulphurets the following conditions should he observed, which are ores:

also applicable to heavily sulphureted silver

1st. The furnace should he connected with an auxilliary reverheratory furnace in which the wash heat may he utilised for the partial roasting of the ore.

2nd. Each of the four rollers should he independently adjnstahle, as in the older style of Bruckner furnace.

3d. Some arrangement should he provided for lifting and shifting the ore, such as Bruckner's diaphragm, or White's "grooves, oavities or projections." The latter may be formed of hricks suitably arranged in the lining, or if arsenio and antimony are absent, of cast iron, holted to the shell.

4th. The openings in the end of the furnace should he larger than they are usually made, by a difference of 8 or 10 inches in the diameter. No neck or throat lining is necessary, hut simply a cast-iron rim to form a flush face to abut against the neck of the fire-hox.

5th. The neck of the fire-hox should he short and in the form of a muffle, of which the circular part should he, when lined with fire-hricks, of an inch less radius than the opening in the end of the furnace. This form will leave the lower portion of the opening in the furnace uncovered to admit air. In order that this opening may be closed when required, more or less, a movahle cast-iron lip, pivoted at one end, shonld he attached to the flat hottom of the fire-hox neck.

Thus arranged, a Brunton or Bruckner furnace, with auxilliary reverheratory, may he relied on to roast thoroughly five tons of clean pyrites daily. The omission of the neck and its lining in the furnace saves iron and fire-hrick. A neck is more useful at the rear end of the furnace, in order to make proper connection with the flue, or auxilliary furnace, hut this may he made of heavy sheet iron and needs no hrick lining.

To those who are accustomed to the rapid destruotion of iron implements in the roasting of refractory silver ore, it is astonishing to see how long iron can withstand the effect of sulphur in the treatment of clean pyrites, when a sufficiency of air is admitted.

The writer is not aware of an instance in which the continuously acting cylindrical furnaces of the White and Howell-White pattern has heen used for the roasting of auriferous pyritss for chlorination, hut is of the opinion that, with the aid of some special arrangements and proper management, excellent results might he got with great economy.

AT the Eureka Con., Eureka, Nev., new shaft the large hoisting works are heginning to assume shape. The machinery will he placed in position after the completion of the hnilding.

Gold Nuggets.

(Written for the PRESS by HENRY G. HANKS, State Mineralogist.)

The valna of gold can only bs measured hy the labor expended in its production. If gold was as plentiful and as easily obtained as iron, it would hava no greatsr valno.

By common conseat ths world has sccepted the theory, that gold must possess a fixed standard valae, and that the value of everything must be measured hy it, while in reality, gold fluctuates in valno like all other commodities, beiag govarned by ths sams lsw of supply aad demaad. When tha supply increases, as when naw fields like those of California and Australia are discovered, everything elso rises in prico, which is eqnivaleat to a fall in gold. Chevalier, of Paris, who wrote a remarkable work on the precious metals about the date of the discovsry of the gold fields of Australia, predicted a fall in the value of gold, which actually occurred. Jacobs, another colsbrated writer on ths sams snbject, has shown, that in every case of the discovery of aow gold fields, or rich aad productive mines of silver recorded in history, the prices of all other thiags have risca in exact proportion.

Dr. Trask, first Stats Geologist of California, publishod a statemeat, which is quoted by Chevalier, to the effect that the average value of the gold collected by a California miner in the year 1854 wss $3.35 psr diem, while the laborer who washed ths saads of the Rhine in the same year conld only collect the value of 28 cents per day, and that it was for this reason and no other, that wages were higher in California than in Germany.

By far the greater part of the gold found in placer mines occnrs in smsll graias, or "gold dust," as it is called. It is one of the peculiarities of tha precious metal that no great masses have ever hsen found, the largest beiag small as compared with known masses of copper, iron and silver.

The following is a partial list of the most celebrated gold nuggets of modern times:

Foreign Gold Nuggets Weighing More Than 100 Ounces.

1. A mass of gold was exhibited at ths World's fair, at London, which is said to have been 3 hundredweight. It is stated that this specimen was hronght up from a deep mine on the back of a man. If the English hnndredweight is meant, it would be 336 lbs. avoirdupois, or 4,899.89 ozs. Troy. It was brought from Chile.

2. With the exception of the Chile nugget the largest mass of gold on record was found at Ballarat, Victoria, Australia, in 1859, and known as the "Sarah Sands." Its weight wss 2,688 ozs. Of all the great Australian nuggets those from Victoria were the largest and most plentiful.

3. Another found at Ballarat, Victoria, Australia, weighed 2,217 Troy ozs., or about 185 lbs. Troy.

4. The Welcome nugget, also fonnd at Ballarat, Victoria, in 1858, weighed 2,195 ozs., Troy. A sample of this magnificent specimen may be seen in the State Museum of California.

5. The Blanch Barkly nugget, which was exhibited at London, weighed 146 lbs. Troy, or 1,752 Troy ozs.

6. The "precions" found at Berlin, Victoria, Australia, weighed 1,621 Troy ozs.

7. In July, 1851, a very large nugget was found in a pile of quartz at Meroo cresk, or Louisa creek, river Turon, 50 miles from Bathnrst, and 29 miles from Mudgee, New South Wales. It was in three pieces, hut is considered to he of the same origin, and is reckoned as one mass. It was found hy a native hoy who saw the glitter of some exposed portion. The total weight of the three pieces was 106 lbs. Troy, or 1,272 Troy ozs.

8. A mass of gold mixed with qusrtz and mundio was found in 1858 at Burrandong, near Orange, New South Wales. After the quartz and snlphide of iron were removed by hammering, the gold weighed 120 lbs., which heing melted at the Sidney Mint yielded a little over 1,182 ozs. of gold, 874 fine, and valued at £4,389 8s 10d.

9. The "Ural" nugget, found, in 1842, in the valley of Tasohku Targunka, near Miaok, Rassia, is now preserved in the Museum of Miniag Eagineers at St. Petershurg. Several others were found near the same locality of less size. A model of this heantifnl nngget, whioh weighed 96 lbs. Troy, or 1,152 Troy ozs., may he seen in the California State Museum.

10. The "Viconnt Canterhury," fonnd at Berlin, Victoria, Australia, weighed 1,105 Troy ozs.

11. The "Vicountes Canterbury," also found at Berlin, Victoria, weighed 884 Troy ozs.

12. There is said to be a mass of gold in the Mnsenm of St. Petershurg weighing 70 lbs., hnt this is probably the Ural nugget (No. 9) wrongly described; weight, 840 Troy ozs.

13. The "Knm-Ton" nngget, found in Victoria, Australia, weighed 718 Troy ozs.

14. The "Sehlem" nngget, found at Dunolly, in Victoria, Australia, weighed 478 Troy ozs.

15. A mass of gold, found in Kiandra, Snowy river, New Sonth Wales, in 1860, weighed 400 ozs.

16. The "Platypus," found at Sandhurst, weighed 377 Troy ozs.

17. A nugget found at Forrest Creek diggings, Monnt Alexander, weighed 336 (?) ozs. Troy.

18. The Brenan nngget, found in Msroo creek, Turon river, New South Wales, in 1851, imbedded in clay, weighed 364 Troy ozs.; valne, £1,156 sterling.

19. The Beauty, fonnd at Sandhnrst, Victoria, weighed 248 Troy ozs.

20. The "Needful," fouad at Berlin, Victoria, Australia, weighed 246 ozs.

21. A gold nugget found at New Chnm hill, Kiandra, Saowy river, N. S. W., in 1861, weighed 200 Troy ozs.

22. Ths crescent found st Berlin, Victoria, Australia, weighed 176 Troy ozs.

23. A golden augget found at Kiandra, Saowy river, N. S. W., in 1860, weighed 160 Troy ozs.

Specimens of Nntive Gold.

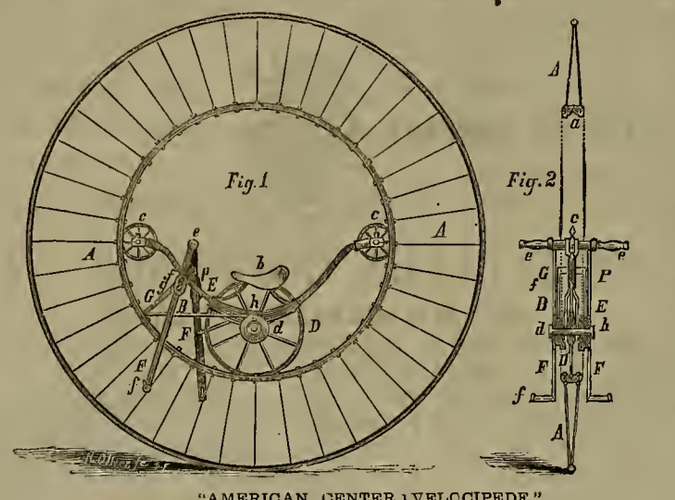
24. One fonad in 1852, st Msroo Creek, Turon river, N. S. W., called "the kiag of the water-worn auggets," weighed 157 Troy ozs.

25. Ths largest nugget found in Australia in a quartz vein, was taken from Old Qnartz Hill, Castlemaine, Victoria, Australia. It weighed 13 lbs. Troy, 156 Troy ozs.

26. A nngget was fouad in 1860, at the Tooloom diggings, N. S. W., which wss nearly solid gold. It woighed 140 Troy ozs.

A Monocycle.

Whea people see the daring bicyclist perched precsriously on top of his two-wheeled steed, those who csnnot ride imsgine he is performing some wonderful feat. He hss two wheels, however, even if they are ia a row; hut whst shall we say of a man who rides one wheel only? There is really a one-wheeled velocipsde, which is exhibited by G. H. Strong, in connection with Dewey & Co.'s Patent Agency at the Mechanics' fair, and the greatest peculiarity of it is that the rider is safer from a capsize than ho is on two wheels.



"AMERICAN CENTER VELOCIPEDE."

The wheel shown in the pavilion and illustrated in the engraving is seven and a half ft. in diameter and has what may he called an open center hub, the central part of the wheel heing snfficiently open for a man to sit where the hub would be in an ordinary wheel. An annular flange is formed on the innsr edge for the grooved driving and guide wheels. The carriage carrying the saddle for the rider is formed of right angled bars having grooved guide wheels on their ends, and a centrally placed bearing wheel immediately under the saddle.

The shaft of the central hearing wheel is extended throngh both sides, and outside its bearing on each side is placed a clutch, arranged to engage with the shaft on the forward stroke of the levers and allow the shaft to revolve independently when the power is relieved.

On the forward bar of the carriage is a short standard carrying a hand bar, which forms the pivot for the levers, which are provided with treadles. To the lower ends of the operating levers are attached the cords which encircle and operate the friction clutches.

To operato the monocycle the rider mounts the saddle, places his feet on the treadle and the hands on the bar. He is then on the center of the wheel, with the center of gravity below the actual center of the wheel. By moving the left foot forward, the lever, hy its cord and connecting clutch, rotates the shaft and central hearing wheel, thus moving the carriage with its rider forward of the center of gravity of the hig wheel, and causing the wheel to rotate and hegin a forward motion. As the pressure of the foot on the lever is released and the lever comes hack for its next stroke, the spring of the clntch rotates the clutch backwards and winds np the cord ready for the next stroke. Meantime the rider has pushed the right lover forward, which acts in the same manner, and, hy working the levers alternately, the carriage is kept forward of the center of gravity and the wheal caused to keep up a continuous revolution, carrying the rider with it. The grooved central and guide wheels revolve on a flange so they cannot he displaced, the guide wheels serving to steady the carriage on which the rider is snpported.

The wheel is guided in its forward motion hy the movement of the hody of the ridsr, who directs the oourse by swaying his weight to one side or ths other. The wsight of ths rider heiag always below ths centsr of gravity of ths wheel makes it run steadily when once in motion from well-known natural laws.

A velocipede of this form is not so difficult to ride as the ordinary oaes, owing to ths rider's weight heing below iastead of ahovs the center of gravity. A very large wheel csn be nssd, as the diameter of whasl is not regulated ia proportion to length of limb as in bicycles. With ths large wheel, and ths rider sittiag below ths center of gravity, a slow motion may he maiatained and tho effort to propel it need not nscessarily hs great. To stop the whesl, the trasdls motion is stopped, when the saddls carriags will roll back of the center of gravity and stop the wheel. This maohins is the iaveation of two citizens of San Francisco, Frederick Langmask aad Peter Strieff.

In the sagravings here shown of thia wheel, which its inventor calls the "Americsn Center Velocipede," *E* represents ths large wheel, *B* is the csrriags carrying its saddle *b*, *C C* ars the guids wheels, *D* is the central bearing wheel. *E* is the standsrd carryiag the haad bar. *e* wheel forms the pivot for the foot levers, *F*, haviag treadles, *f*. The levers, *G*, form parts of compound levers with the levers *F*, but in the mschine at the fair only single levers are used.

Death of Geo. Daly and Others.

George Daly, well known in mining circles on this ooast, was killed hy Indians in New Mexico on ths 18th inst. Daly fignred extensively in a controversy with the Typographical Union in this oity years ago, while in the *Alta* office. He went to Virginia City in 1873, and was for some time engaged as foreman there. He was also Superintendent of the Florida and one or two other mines, in 1876. The Virginia *Enterprise* says: "In Dscember, 1878, he went to Aurora and took charge of the Rsal del Monte mine as Superintendent, afterward taking charge of the Mono and Jupiter mines, and running all three for some time. He came back to this city in Octoher, 1879, and sold his interest in the joh office to Mr. Sutherland, and left, Novemher 1st, for Leadville, Colorado, where he became Snperintendent of the Little Chief. While in Colorado he was Snperintendent of four or five mines, and was Superintsndent of the Chrysolite at the time of the riot. Afterward he for a timo had charge of Gov. Robinson's mines. He then went to New York, and was sent to New Mexico by Geo. D. Roberts to look after certain mines in that region. Mr. Daly was interested with Mr. Roberts in the mines in New Mexico.

"George Daly was a very wide-awake and enterprising man, a stannch and true friead, and a hitter but not unreasonable enemy. He had nothing of the desperado nor even of the desperate man ahout him. On several occasions, while in charge of mining properties, he was involved in troubles where there was hloodshed, bnt he was always sure that he had the law on his side in every move he made. No doubt he was a man heartily hated by many persons, hnt through all he has had the respsct of the really hrave among his enemies, and such will regret to learn that the fearless little man has fallen a victim to the murderous Apsches."

The Indians attacked the outskirts of the settlement and massacred a number of women and children. Daly led a charge of volnntesrs in conjunction with a company of soldiers. Daly, in company with Lieut. Smith, 17 soldiers and some citizsns, followed the Indians. George and the Lieutenant took the lead, and about 15 miles from the mines they ran onto the Indians, who had caused their horses to pass through a small canyon, and they took to the hills. George and the Lieutenant coming np, rushed through the canyon, and were killed almost instantly hy the Indiaas, who were upon the hills.

General George S. Dodge died in Oakland on Wednesday. He was for years a leader in mining ciroles on this coast. No soheme was too colossal for him to handle, and prominent capitalists of this city wers always rsady to stake moaey and credit on his skill, jndgmeat and snterprise. Mining camps in all the Ststes and Territories on this ooast are indehted to his easrgy and capital for development. Hs was taksn ill abont four years sgo, and for thres yesrs has been helplessly invalid.

Capt. W. H. Gillespie, a California and Nevada pioneer, and aa old prospector, was fonnd dead on the desert 30 miles from Darwin, Inyo Co., on the 14th inst.

At the University.

Tuesday was a memorahle day at the Universsity. The occasion wss the insngnration of the newly elected President, W. F. Rsid, the dedication of the Baoon Art Buildiag and the expression of thsnks to seversl publio spirited citizsns who havs made snbstantial contributions to ths fnads and fscilities of the Uaiversity. There was a large attendance of the friends of the institution from different parts of ths State. The character of the exercises and the spirit of ths occasion were gratifying to all. Governor Perkins prssided at the meeting, whioh was held in the Harmon Gymnssium huildiag, sad made an eloquent address, setting forth the high position snd usefulaess of the University and urgiag npon all the dnty of msintsining and advaacing its character and its efficienoy. He then eatrusted to tas new President the insignia of his office.

President Reid accepted the charge in a few well-chosen words, snd then delivered his inaugural address, was which eminently practical in its character and its suggestions. Chas. H. Outman, of the Ssnior Class, followed Mr. Reid's address with an address on behalf of the students. He was snceeeded by John R. Jarhoe, who delivered an excellent oration, dedicating the Art Library bnilding and acknowledging the gifts of the late M. Reese, the late L. A. Pioche, Chas. Mayne, A. K. P. Harmon, and the recent gift of D. O. Mills. Henry D. Bacon, the donor of the Art and Library Fund, closed the literary exercises with an address reviewing the stsps which led to his gift to the University for the pnrpose of securing a center of art npon this coast, from which might emanate correct standards of taste and true views of beanty.

We havs not space for the lengthy address of President Reid, hut take the following remarks he made concerning the colleges of mechanics and mining: I had intended to speak also of our colleges of mechanics and mining, and I conld speak with pleasure of all of our colleges of science, hut fortunately for them they are alresdy rsgarded with a fair share of public favor. Although our colleges of mechanics and mining, representing, as they do, and proposing the solution of so many of the great industrial prohlems of this coast, are regarded with great publio favor, yet until very recently they have received little or no encouragemsnt and as little support. Within the last three years, however, they have received at the hands of the State a recognition from which we may hope for the most gratifying results. I am sorry, however, to believe that by maay they aro too much regarded as a short way to remunerative employment, in which not much work need he done, and in whioh the hands be little soiled. Their purpose is more serious, and I trust that their efficiency may be so increased that the entire industries of this coast may with safety be placed in the hands of our own sons, educated in our own University.

Upon the whole the meeting was one calculated to do the institntion good, to eucourage its friends and stimulate its forces to grester efforts for its prosperous future.

MINERS SHOULD READ THE LOCAL PAPERS.—It is a well-established fact that the recent gigantic legal battle between the Alhion and Richmond companies at Eureka was decided in favor of the latter through a pateat hsing secured to ground on which there had been an older clsim, and that that claim was good and valid until other parties secured a patent to the gronnd without a protest from the original claimants. It is more than probable that the older locaters never read the local papers and consequently missed seeing the patent advertised which covered their ground. This shonld tsach mining men the valne of suhscribiag for and reading their local papers.—*True Fissure.*

MANUFACTURE OF SALT.—John Kinney informs the Battle Mountain *Messenger* that he is very busy nowadays at the salt mill prepariag the article for the market; that his sales average from 100,000 to 150,000 lbs. per month; that the last month he has shipped to Lewis alone, 60,000 lbs. The salt business there, when they get all the mills operating, will be very lucrative.

THE Black Bear quartz mine, Siskiyon county, is said to he paying better than ever of late, from opsrations in the old levels where there is an ahundance of good paying quartz. The mill is now run up to its full capacity of 32 stamps. The same company has also completed their 4-stamp steam mill on Kasch ledge, in the vicinity of the Last Chance mine.

THE five-stamp mill of the May Lundy, Moao county, is bsing doubled in capacity, all the maohinery beiag now on the road, and the new battery will he in working order before the olose of the present month.

Make Public Your Developments.

The following very sensible article from the Salt Lake *Tribune* will apply to mining camps everywhere, so we publish it: There is one great lack in the Utah mining camps to which we have from time to time directed earnest attention. That is the failure of the mining men to publicly make known their doings and the results of their operations. In some of the camps, indeed, the feeling goes even to the length of a positive effort to prevent such information being made public. This latter is excused on the pretense that there is a mining ring in Salt Lake City which interferes to prevent independent sales, and which attempts to hold down deserving mining properties and binder their merits being made known, to the end that when the time comes they may pick up all the best of them for a song. And further, that if public announcement were made of contemplated transactions, this ring would interfere to stop them, or blackmail the owners. We think, however, that the suspicion of this assumed ring is much exaggerated; that while there may have been from time to time a disposition shown by operators here, analagous to the much-talked-of "courtesy of the Senate," which prevented them interfering with each other's transactions or bidding against each other for ores or properties, that courtesy, miscalled collusion, has not been so universal or general as presumed by those who complain of it. But even if such a ring existed, and even it Salt Lake were the small provincial town that theory assumes it to be, the way to cure the evils is certainly not to keep quiet about the mines and mining camps, and to fail to make public the developments and prospects of the different localities. The direct contrary is the way to induce independent and untrammeled capital to come in, to buy these promising claims, and to open up the country. With far less real wealth and prospect of lasting and steady bullion output, other portions of the mining regions are talked of all over the civilized world; the surplus wealth of the globe is attracted to them, and they are being developed by it into the bonanzas nature has made them. But in Utah there is little talk, and nothing like a steady report of what is doing. With a bullion output of six to eight millions a year reported, there is much not publicly known, or that is credited elsewhere. We venture to say that there was more written and published about Lendville in the first year of its glory than there has been said and written about the mines of Utah in ten years. The Ontario shipments are reported regularly, but the developments of the mine, the new works contemplated, the quality of ore taken out from week to week, the quantity of it, the reserve ore bodies, all matters of high interest to mining men are not published. The Horn Silver, which should figure hugely in public estimation, and be a pillar of fire to guide hither the capitalist who has more money than he can profitably employ elsewhere, is scarcely mentioned: and the public knows little of what is doing except a brief statement of bullion shipment from time to time. These large properties should be a benefit to the countries in which they are. in the way of inducing investments in other properties, that more paying mines might be developed, as they undoubtedly would be if properly explored. There is no use trying to evade the fact that the mining country which is most talked about, and whose merits are substantial and the best presented to the public attention, is the region where mining capital will go. This capital, in turn, will open up the country and make a fact out of what was before but a promise. By reason of the lethargy of mining men in Utah about giving the public such facts as would draw here the attention of the world, the mining boom is likely to come here the last of all; when other camps of less permanence have been exhausted, and when the merits of the country will absolutely force themselves upon public attention. We advise, therefore, the smothering of jealousies and suspicions, and a united effort all along the line to truthfully set forth the great richness and probable permanence of the mines of Utah; the developments made from week to week or from month to month; the mining sales negotiated or in progress and the net result of the combined mining industry, at least once a month, from the mills and smelters. We can conceive of nothing which would so quickly bring Utah into its proper place in the public mind as a faithful carrying out of those suggestions, and adherence to them.

To this we may add, incidentally, that there is nothing like aggregation for these presentations to have their combined and appropriate effect. To this end we proffer the use of the columns of the *Tribune* for the purpose herein advocated. This is the great mining journal of the interior. To it men naturally turn to get the information they desire about the mining industries of the inner mountains. A proper showing massed in its columns, such as mining men might make at no cost to themselves and with very little trouble, would form a record which would surprise the world. Suppose you try it, gentlemen.

IMITATION GROUND GLASS.—A very useful kind of varnish is made known by Leon Vidal, which is excellent for producing imitation of ground glass, and will doubtless be found available for other purposes. The formula is: Sandarac, 18 parts; mastic, 4 parts: ether, 200 parts; benzol, 80 to 100 parts.

MONTANA expects to ship 2,000,000 lbs. of wool down the Missouri river this year.

Interior view of Dewey & Co's Office. 202 Sansome St., S. F.

PATENTS obtained promptly; Caveats filed expeditiously; Patent re-issues taken out; Assignments made and recorded in legal form; Copies of Patents and Assignments procured; Examinations of Patents made here and at Washington; Examinations made of Assignments recorded in Washington; Examinations ordered and reported by Telegraph; Rejected cases taken up and Patents obtained; Interferences Prosecuted; Opinions rendered regarding the validity of Patents and Assignments; Every legitimate branch of Patent Soliciting Business promptly and thoroughly conducted.

Our intimate knowledge of the various inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons, and our success and business are constantly increasing.

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—AND—

INGERSOLL ROCK DRILLS.

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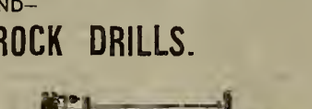

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Oscillating Stamp Mill

It has no Stems, Cams, or Tappets, and Adjusts Itself to the Wear of the Shoes and Dies.

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Assaying and Metallurgy of Silver taught theoretically and practically.
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IT HAS BEEN FULLY PROVED AND TESTED.
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☞Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
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Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
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FROM 1-4 TO 10,000 lbs. WEIGHT.
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An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
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This Company has the best facilities on the Coast for working
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IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

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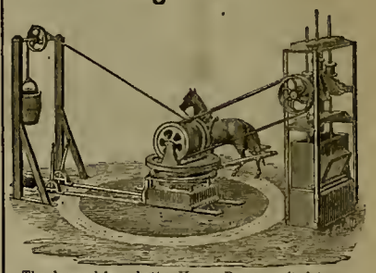

The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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DODGE ROCK BREAKER
Challenges the World
To produce as good and cheap a Machine. Rock Breaker and Cornish Rolls combined in one Machine. Pulverizers, to Granulate Ores, for Roasting, Chloridizing, Leaching and Concentrating.

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FOR CONCENTRATING
Gold, Silver, Lead and Copper Ores.
Furnaces for Roasting and Chloridizing Ores, for Amalgamation or Leaching.
Plans, Drawings and Estimates for Working Ores by any process.
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ALEX. DEL MAR,
Mining Engineer,
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☞Reports, Surveys and Plans of Mines made.☜

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.

FOR WEEK ENDING AUGUST 16TH, 1881.

245,684.—PICK—THOS. Williams, White River, Cal.
247,709.—SPRING BED BOTTOM—B. F. Farrar, S. F.
245,614.—AIR COOLING APPARATUS—H. J. Dykes, S. F.
245,749.—HOISTING GEAR INDICATOR—I. M. Scott, S. F.
9,340.—FEED WATER HEATER AND PURIFIER—Reissue—R. Llewellyn, S. F.
245,795.—AUTOMATIC STOCK FEEDER—I. L. Dias, Petaluma, Cal.
245,768.—FLYING SHIP.—Wm. Beeson, Montana Ter.
245,785.—GRIP FOR CABLE R. R.—H. Casebolt, S. F.
245,918.—BUCKLE—M. Dattelbaum, Virginia City, Nev.
245,797.—FRUIT DRIER—W. C. Doherty, Albany, Or'gn.
245,627.—GRIP FOR ROPE R. R.—Grim & Low, S. F.
245,622.—INSTRUMENT FOR CUTTING WASHERS—Thos. Haggerty, S. F.
245,032.—FEED AND SET WORKS FOR SAW MILLS—F. A. Huntington, S. F.
245,724.—ORE CRUSHER—D. B. James, Visalia, Cal.
245,891.—ATTACHMENT FOR COAL OIL BURNERS—C. F. Thurmm, S. F.
245,896.—REMOVING AIR AND GREASE FROM FEED WATER.—D. D. Wass, S. F.
245,689.—VENTILATOR AND CONDUCTOR—J. N. Young, Sacramento, Cal.
245,674.—TRAP—J. T. Titus, S. F.
245,755.—WAGON BRAKE—J. C. Walker, Helena, Montana Ter.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

AIR-COOLING AND PURIFYING APPARATUS.—Hugh J. Dykes, assignor one-half to Frank Shay, San Francisco. Dated Aug. 16, 1881. No. 245,614. This invention is intended for cooling and purifying air, to be used in sick rooms or in sleeping rooms. It consists in the employment of a rotating cylinder mounted upon suitable supporting rollers and having its interior subdivided so that one compartment may be filled with a refrigerating compound, while air may driven through the other part so as to pass over the cold surfaces and thus have its heat abstracted. It may pass over or through lime, lime water, or other material, by which it will be freed from its carbonic acid and other impurities, and it may be returned into the room to be used over again. The air is caused to circulate by the movement of a rotary fan blower or other air forcing apparatus, which is driven by means of a clock work or other mechanism, and draws the air into the room, passes it through the cylinder, and returns it to the room again. An apparatus of this kind would have been useful in the room of President Garfield during the late hot weather.

VALVE MOTION AND GOVERNOR.—W. L. B. Collins and L. L. Barrett, Vacaville, Solano county, Cal. Dated August 9, 1881. No. 245,351. This invention relates to certain improvements in valve motions and governors for steam engines; and it consists in the employment of peculiar double balance valve and cut-off in combination with a governor which regulates the action of the cut-off valve, while the main valve is actuated directly from the engine shaft. This cut-off valve is connected with the main valve by springs so as to move with it when not acted upon by the governor. The governor moves a cam, and through a connecting lever intercepts the cut-off valve stem at the point where the main valve opens so as to admit steam to the cylinder during a part of the stroke of the piston, which will be determined by the action of the governor and cam. At the proper time the cut-off valve will be released and the springs act to throw it forward and instantly close the port.

FLANGE CONNECTION.—Irving M. Scott, S. F. Dated, Aug. 9, 1881. No. 245,403. This invention relates to an improved flange connection for joining the ends of pipes, and it consists in providing the ends of the pipes with peculiarly-shaped flanges and securing them with peculiarly-formed bolts. Pipes are ordinarily connected by bolts driven through simple flanges, and the bolt holes on each have to correspond. This is inconvenient when a length of pipe has to be connected with one already in place, because its position may render it impossible to make the bolt holes correspond. The object of Mr. Scott's invention is to provide such an intermediate connection as will permit the pipes to be easily joined in whatever position desirable.

BED BOTTOM.—B. F. Farrar, San Francisco. Dated Aug. 16, 1881. No. 245,709. This invention relates to certain improvements in that class of bed bottoms which are comprised of combined springs and longitudinal slats. The improvement consists in the combination of certain devices by which the bed bottom and side bars are united by a continuous web, and the bed bottom adapted to be taken apart for the purposes of transportation.

AUTOMATIC STOCK FEEDER.—Isaac L. Deas, Petaluma, Cal. No. 245,795. Dated Aug. 16, 1881. This invention relates to a novel device for watering and feeding stock at stated intervals whereby, without the intermediate supervision of anyone, the required amount of food and water will be deposited in the manger. It consists of a peculiarly constructed receptacle, having a bottom or door in two parts, each secured by peculiar latches, said latches being connected with two alarm mechanisms of a clock, so that at the desired time the latches may be tripped and the feed deposited in the manger. It consists further in the employment of appropriate mechanism, operated by the bottom of the box in its fall, and connected with a receptacle or tank for water alongside of the manger, in which tank a common floating ball operates to regulate and close the flow of water.

HEADER ATTACHMENT FOR HARVESTERS.—Franklin R. Allen, Modesto. Dated, Aug. 9, 1881. No. 245,337. Mr. Allen's invention relates to an attachment for a combined header and thresher; and it consists in the construction, hinging and balancing of the frame which carries the sickle and main draper, in such a manner as to permit it to be easily raised or lowered for high or low grain, the movement of the attachment being made independent of the main frame. It is specially adapted to be attached to such a combined harvester and thresher as was patented in U. S. patent, No. 198,522, on which the heavy frame of the header is not moved with the hinged frame, the latter being moved alone.

PICK.—Thos. Williams, White River, Tulare county, Cal. Dated Aug. 16, 1881. No. 245,684. This improvement in picks consists in a novel means of securing and adjusting the points within the head, and in a peculiar construction of said heads for the reception of the points.

News in Brief.

THE mania for gambling in grain is spreading in the East.

ALBUQUERQUE, N. M., is to be supplied with coal from Arizona.

THE Colton cannery pays out $5,000 a week for fruit and wages.

THE Central Pacific railroad is replacing its iron rails by steel ones.

THE estimated surplus grain for export this season will reach 300,000 tons.

AT Seattle, W. T., the run of salmon has begun, and promises to be very large.

THE duty on the railroad iron brought to San Diego by the *Trafalgar* a few days ago was $71,800.

THE Chinese at Modesto have organized among themselves what they claim to be a Lodge of Freemasons.

THE subscriptions to the public monument to Beaconsfield amount to only £5,000, which disappoints the committee.

JOHN EVERETT MILLAIS has been appointed a trustee of the National Portrait Gallery, in place of the late Dean Stanley.

THE Almaden Mining Co. are storing 2,700 tons of English stone coal. A number of teams are engaged in hauling it from San Jose.

THE worst water famine ever known in Richmond, Va., now prevails. The workshops are closing, and even residents are without water.

A GIGANTIC acid tank was set in place at the Lyon Mill and Mining Co's. works last week. It holds 2,780 gallons, and took 2,780 pounds of lead to line it.

ENGLAND still watches actively the movements of North Africa. The prompt action of the ship *Monarch* respecting the outrage on the Susa is much approved.

A BASKET left at the Midland railway station, in London, by two men who immediately decamped, was found to contain a large quantity of gunpowder and cartridges.

THE pine, oak and cedar forest of Northern Arizona are very extensive, and if placed together they would cover a tract of land 350 miles long by 60 miles in width.

THIRTY-FIVE hundred men are at work on the line of railroad between The Dallee and the Cascades, and it is expected the line will be completed by the end of September.

A VIENNA dispatch says the excessive rains in the last few days have damaged the harvest in many places, and in the districts of Laibach and Corinthia it is entirely destroyed.

THE military authorities have been ordered to prepare flying detachments to proceed to different parts of Limerick county at a moment's notice, as disturbances are anticipated.

A DRUNKEN man at Buffalo fooled with two of the "brushes" in an electric light generator and was picked up dead. Fully a dozen men have been killed about electric lights in the past year.

SINCE the Eureka and Colorado railroad has become a fixed fact, property along the proposed route has advanced enormously in price. Ranchos that could have been purchased for $5,000 and $10,000, two weeks ago, are now valued at $100,000.

THE New York brewers, among their answers to the interrogatione of the Temperance Society about the modes of manufacturing beer, admit that they often use instead of barley malt, such substitutes as cornmeal, cornstarch, rice, grapes, sugar and glucose. They added: "We will discontinue the use of these so soon as your society shall show them to be deleterious."

THE *Leader* has information that a movement is progressing in official circles to have Vennor of Canada supersede Hazen as chief of the Signal Service. Prominent military men and scientists are said to be interested.

THE business portion of the town of Sebastopol, Sonoma county, was burned Sunday night. The fire originated in S. B. Berry's livery stable, and destroyed nearly all the buildings on the east side of Main street, and several on the west side.

THE recent heavy rain storms and washouts have somewhat delayed the extension of the Southern Pacific railroad toward Galveston, but work is being pushed forward with great activity in spite of the elements and unfriendly litigation.

SOME very important coal discoveries have recently been made in King county, W. T. Two different parties have discovered anthracite coal, the veins being clearly defined and the coal of fine quality.

EGYPT drifts toward a military despotism. The worst kind of insubordination on the part of the soldiers is stimulated by the Khedive for his own purpose. England has already intervened in this matter.

AFTER the students' "rush" at Berkeley on Wednesday, a number of the students adjourned to a beer saloon of a man named Bachman, and indulged very freely. President Reid quickly made his appearance on the scene and dispersed the gathering, and then proceeded to swear out a warrant against Bachman for violating the law, which forbids liquor to be sold within two miles of the University.

MINING AGENCY.—Mr. James A. Mars, who for many years was manager of the California Assay Office, has established a very comprehensive agency for the purchase and sale of mining properties, having branch offices in the principal cities of the Atlantic States and in Europe. Mr. Mars' familiarity with our mining interests, has been acquired by long experience and personal examination. As will be seen by Mr. Mars' card, which appears in our advertising columns, his name receives the endorsement of leading mining men, capitalists and banks; and these names will be sufficient guarantee to those who know them that Mr. Mars' capacity and probity must be unquestioned to receive their sanction. This also indicates that his promises to purchasers or owners will be fulfilled. The attention of those having mines for sale is called to the card. One of the commendable features of this enterprise is, that the investor shall have his mines examined by experts of his own selection.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. F. OSBORNE—San Francisco.
G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—San Mateo and Santa Clara counties.
C. E. WETMORE—Alameda county.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct, or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F.D., at this office.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We will send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

$40 RIFLE FOR ONLY $15.—The Evans 20-shot Sporting Rifle, advertised by E. G. Rideout & Co, 10 Barclay street, is a great bargain We are positively assured that the retail price of these Rifles was $40 each; any one can get the same Rifle now by sending to the above named firm only $15. They offer to refund the money sent if the Rifle is not as represented. Read their large advertisement in this issue.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francisco.

COPP'S "U. S. MINERAL LANDS, LAWS, FORMS, INSTRUCTIONS AND DECISIONS."—1881. 570 pp. In full law binding, $4.50; half law binding, $3, at this office.

San Francisco Metal Market.

[WHOLESALE.
WEDNESDAY, August 24 1881.

IRON.—	
American, Pig, soft, ton	— @30 00
Scotch, Pig, ton	— @25 00
American White Pig, ton	— @— —
Oregon Pig, ton	— @26 00
Clipper Gap, White	@28 00
Clipper Gap Car Wheel	— @35 00
Refined Bar	4½@ 8
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	— @ 9½
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	16 @ 18
Black Diamond, ordinary sizes	13 @ 15
Drill	15 @ 18
Flat Bar	— @ 16
Plow Steel	15 @ 16
COPPER.—	
Ingot	— @ 52
Sheet	— @ 20
Sheating, Tinned 14x18	— @ 42
Nails	— @ —
Bolts	38 @ 42
Old	— @ 18
Bar	— @ 22
Cement, 100 fine	— @ 15½
LEAD.—	
Pig	— @ 4½
Bar	— @ 6
Pipe	— @ 8
Sheet	— @ 9
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES.—	
10x14 I O Charcoal	— @ 7 50
10x14 I O Coke	6 00 @ 6 25
Banca Tin	—@25 00
Australian	—@22 00
I. C. Charcoal Roofing 14x20	— @ 7 25
" " " 20x28	20 00 @21 00
ZINC.—	
By the Oask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS.—	
Assorted Sizes	3 50 @ 3 75

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Company,

Nevada Block, Room 37, San Francisco, Aug. 15, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 70) of Fifty (50) Cents per share was declared, payable on Saturday, August Twenty-seventh (27), 1881. Transfer books closed until the Twenty-ninth (29) inst.

W. W. TRAYLOR, Sec'y.

Consolidated Virginia Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Virginia Mining District, Storey County, State of Nevada.

Notice is hereby given that, at a meeting of the Board of Trustees, held on the twenty-second (22d) day of August, 1881, an assessment, (No. 16) of Thirty (30) Cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, 309 Montgomery street, Room 26 (Nevada Block), San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-fourth (24th) day of September, 1881, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on Saturday, the twenty-second (22d) day of October, 1881, at the hour of eleven (11) o'clock A. M., at the office of the Company, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

A. W. HAVENS, Sec'y.

OFFICE—Room 25, No. 309 Montgomery street (Nevada Block), San Francisco, Cal.

The Oxford Beta Tunnel and Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Aurora, Esmeralda County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the Twentyseixth (26) day of August, 1881, an assessment, No. Twenty-nine (29), of Twenty (20) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Rooms of Dr. Knowles, 118 Dupont street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the Twenty-sixth (25) day of September, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the Seventeenth day of October, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. H. PEOK, Sec'y.

Office—Rooms of Dr. Knowles, 118 Dupont street, San Francisco, Cal.

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A $40 Twenty-Six Shot Sporting Rifle for $15

AN EXTRAORDINARY BARGAIN.

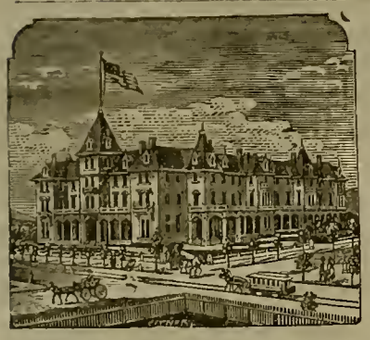
THE EVANS TWENTY-SIX SHOT MAGAZINE SPORTING RIFLE.

SHOOTS 26 SHOTS IN 60 SECONDS WITHOUT REMOVING FROM THE SHOULDER.

No hammer in the way. Throwing down the guard EJECTS LOADS and COCKS. THE EVANS is without exception the most accurate, longest ranged, easiest loaded, quickest fired, best constructed, simplest and most perfect breech-loading Rifle in the World. The new model and latest Improved EVANS MAGAZINE SPORTING RIFLE is exactly as represented in above cut. It is .44 Calibre, centre fire, 28 & 30 inch barrel, engraved black walnut stock, and sighted with graduated sights up to 1200 yards, at which distance it is more accurate than any Rifle in the world. The magazine which is located in the stock as shown in Cut Number 2, Contains 26 shots, or more than double the number of any other Repeating Rifle in the world. The working parts are ALL STEEL of the finest quality, case hardened and blued and the New Patent Locking Device makes it POSITIVELY SAFE TO CARRY when loaded. THE EVANS is a great favorite with sportsmen on account of the rapidity with which it can be fired, as well as for its accuracy at any distance from 100 TO 1200 yards. Owing to the failure of the Evans Rifle Co. we were enabled to purchase their entire stock of $50,000 worth of perfect Rifles for less than one-third the cost of manufacture, and as these beautiful and expensive Rifles cannot be made cheap enough to compete with cheaper Rifles, they will not be made again. This will be your last chance to secure one at the low Price of $15 and we pledge our business reputation that they cost to manufacture double what we ask for them.

UNTILL FURTHER NOTICE we will send one new model Rifle as above described carefully boxed for only $15 and when cash accompanies the order, will send a box of reloodable Metallic Cartridges and samples of the new phœnix 3 ball cartridge, a great invention in amunition with which three balls can be shot into a target incring at 50 yards. SEND MONEY by P. O. order or Registered Letter at our risk, or we will send the Rifle C. O. D. (collect on delivery) with privilege of examination before paying, upon receipt of $2.00; or your express agent's written guarantee that the Rifle will be returned free if you do not take it, but we do not send the Cartridges if sent C. O. D., as this is an extra inducement to those who send Cash With Order. WHAT IS SAID OF THE EVANS! UNSOLICITED TESTIMONIALS! "The Evans has been my constant companion for two years. I have shot 60 Buffaloes at one run, and pennies from between my wife's fingers, at 40 paces."—Kit Carson, Jr. "The Evans is simply immense. I am proud of it."—Joseph Arnold, Vice-president First Nat. Bank, Lockport, N.Y. "I have used the Evans in competition with the Sharp, Winchester, and Ballard, it beats them all."—J. Frank Locke, Burnamsville, Minn. "It shoots like a house a fire! I can clean out a whole band of Indians alone with it. I shall recommend them wherever I go."—Texas Jack. "It is the Strongest Shooting Gun I ever put to my shoulder, and as for accuracy it can't be beat. I know it to be the best Rifle in the market."—J. A. Boyd, of Yates' Sharp shooters. We guarantee every Rifle Perfect in every Respect.

THE EVANS SADDLE RIFLE, similar to the above, except a trifle lighter and 22 inch barrel, price $14, including swivels and straps. THE EVANS can be used as a single shot breech-loader and the magazine held in reserve if desired. Price of reloading tools for reloading shells, $4.00, former price $6.00. Evans cartridges can be reloaded many times. ORDER NOW, even if you have no use for a Rifle for some time to come. You will never get another such bargain and you can readily sell it for $30 to 40, and we hereby agree if the rifle is not exactly as represented to refund the money in every instance and pay you $5.00 for your trouble. SPECIAL OFFER.—Any one getting up a Club and sending us $80 will receive seven rifles. We refer to any Bank, Mercantile Agency, Express Company, or Newspaper Publisher in this City. ADDRESS E. C. RIDEOUT & CO., 10 Barclay St. N.Y.



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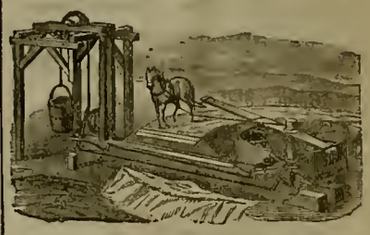

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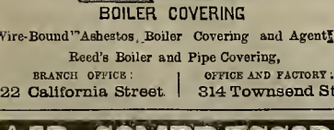

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BOTH PROCESSES ARE PERFORMED AT ONE OPERATION.

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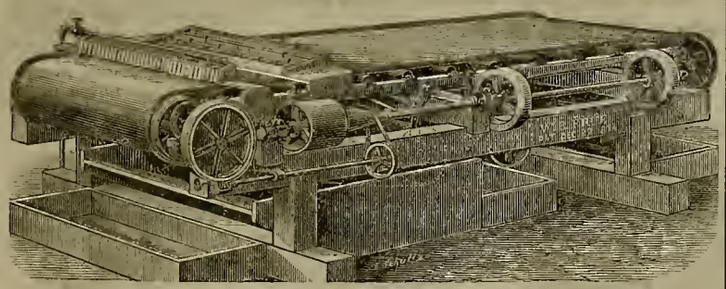

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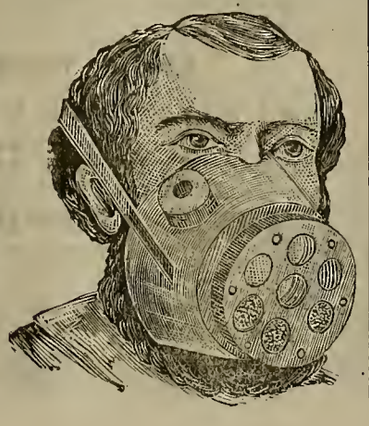

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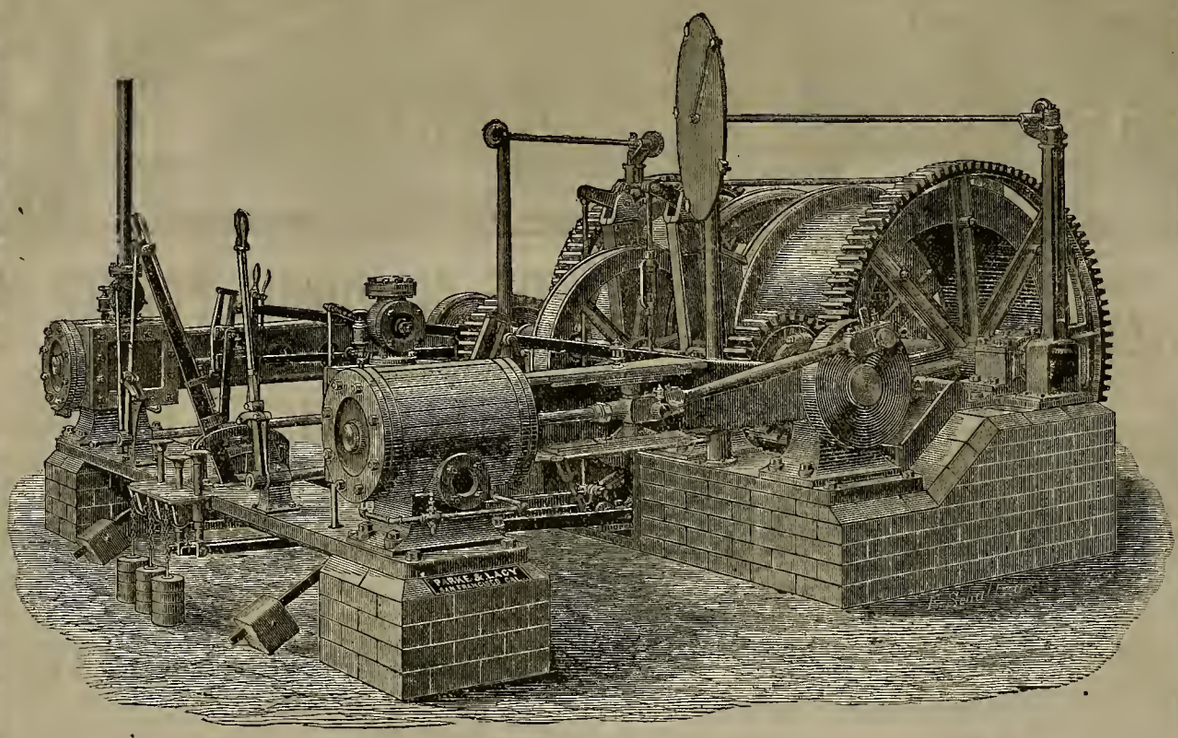

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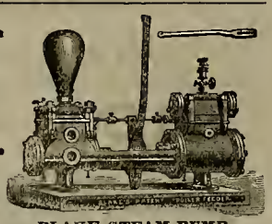

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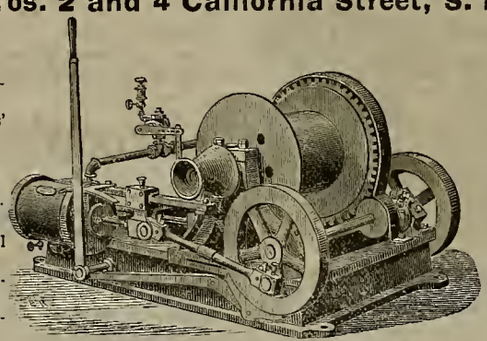

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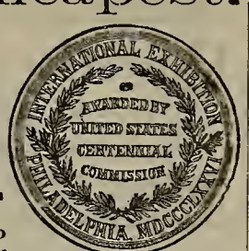

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SAN FRANCISCO, SATURDAY, SEPTEMBER 3, 1881.

VOLUME XLIII Number 10

Cable Railroads.

History of the Growth of a California Invention.

Description of the Wire Rope System for Street Cars.

It is not very long ago since the mode of navigation through the streets of large cities was by means of sedan chairs, and to-day the jinrikisha is the mode of locomotion through the principal cities of Japan. The street railway is a modern invention, and can be traced back to a very recent period, for, previous to 1850, street railways were not in use, and it was about that date they were first introduced in the United States, and for many years they were enjoyed only in the country, and their success, pecuniarily or otherwise, soon caused their adoption in nearly all the leading cities of Europe.

Yet the idea was not new, for tramways were in use early in the 17th century; but the tramway of that date was a very different thing to the street railway, or tramway as it is called in Europe, of the present time. There is little new under the sun, and when the Romans paved the way for the wheels of their chariots to roll on, or smooth roads were made for people to tramp on, they were but the precursors of tramways, or trampways, and long before Mr. Outram, by a singularity of connection of name and subject, suggested the practical tramway of the pre-railway period.

Yet it is unfair to say that the street railway of to-day is an old idea revamped, because some one had an idea that something of the kind might be done in some kind of a way. Break the eggshell and stand it on its end, and everybody will tell you they knew that before.

But long before

Street Railways Came into Fashion,

Stage coaches lumbered along pretty fair roads for the time, and each took the ruts of its predecessors, and thus had a tramway of its own, with a hollow rail of Mother Earth to run on. But in these days everything ran or walked on the king's highway, and it was not then the trampway as it is to-day, when tramps ruleth the road.

But long before the street railway came into practical use, much had been done in the way of thinking about it, and various contrivances were invented, more or less impracticable, to facilitate the mode of passenger traffic in streets, and to render it easy, rapid and cheap; but it was a long time before the old rumbling omnibus was supplanted by the horse cars of to-day, which have in their turn been, to a threatening extent, supplanted in New York city by the elevated railroads, and in San Francisco, 3,500 miles west, by the cable railroads.

It is the Cable Railroads,

More particularly, that we are now interested in, and which threaten to revolutionize the street railroad system, and to abolish the horse cars, and to the history of this invention we now propose briefly to turn our attention, and look back a little to see what had been done in this particular previous to the conception of the first cable road in this city—the Clay street hill railroad—by Mr. A. S. Hallidie.

Without wire ropes it would be difficult to work these cable roads economically and successfully. Wire rope was the invention of Mr. Andrew Smith, a native of Scotland, who experimented with the use of metal wire for ropes in 1828, and took out his first patent in Great Britain, January 12, 1835. Since then the material from which wire is made has been improved until now steel wire is made capable of sustaining a tensile strain of 120 tons per square inch area.

Steps of Progress.

As far back as 1812, W. and E. K. Chapman of England proposed to stretch a chain along the road, made fast at both ends, and to place on the carriage to be moved a grooved wheel, around which the chain was wound, and by turning the wheel propel the carriage.

In 1834, Wm. Jaines of England proposed to employ hollow rails as receptacles for a moving chain, and to attach, by any convenient mode, carriages thereto.

In 1846, E. W. Brandling of England proposed to place on the road a rectangular box, secured to the track, under the carriage, in which were four rails on which ran four wheels. A rope was used and a prong was projected from the carriage into the box, which, by twisting, compressed two boards over the moving rope, and thus hauled the carriage along.

In 1858 E. S. Gardner, United States, proposed a tunnel with a slot along its length, with a rope running on sheaves. He does not show any mode of connecting the rope with the car, and says the mode of connection is immaterial.

In 1859, Messrs. Foster and Brown, United States, proposed to employ an endless traveling rope, supported overhead by arms attached to posts. A catch or grab is attached to the car of a street railroad; a spiral spring intervenes between the car and the catch. When it was desired to start the car, the catch takes hold of the overhead rope. This is very similar to Beauregard's patent of 1869. (See Fig. 1.)

Robert and William Hawthorn, of Great Britain, in 1863, proposed to actuate, by means of a traveling wire rope, a number of wheels placed between the tracks and the carriages. The carriages were to be provided with draw bars, which were lowered so as to come in contact with the revolving wheels, and thus move the carriages.

In 1864, Mr. A. C. Bach (now of the *Scientific American*) proposed to move street cars by a chain with peculiar links running on a grooved rail and connected to car by a simple arm. The chain had friction rollers attached. He also combined the brake with the connecting device, to insure co-operative action. (See Figs. 2 and 3.)

[CONTINUED ON PAGE 153.]

LITHO. BRITTON & REY, S. F.

FIG. 20.—CLAY STREET HILL WIRE ROPE RAILROAD, ASCENDING AN INCLINE OF ONE FOOT IN SIX—THE FIRST CABLE ROAD CONSTRUCTED.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Mineral Park Mines, Arizona.

Editors Press:—The Atlantic and Pacific R. R., now building through northern Arizona, opens to civilization and settlement a vast area of country rich in timber, coal and precious metals, and much of it well adapted to stock raising.

This region which, owing to its inaccessibility has so long remained *terra incognita*, is blessed with an incomparable climate and stands unrivaled among all the Territories for the grandeur of its scenery. But the feature which above all others recommends it to capital and enterprise, is its mines of gold, silver, copper and lead. Quartz mines everywhere require money (which the original locators seldom possess), to develop them and reduce the ores. Cheap Transportation and Quick Transit In this age of progress is a first requirement of investors. The bonanzas of Tombstone were unworked and unknown until the Southern Pacific brought capital and cheapened material. In Mohave county, the Atlantic and Pacific is destined to build up "camps," rivaling Tombstone in prosperity and importance. Passing through the coal region in northeastern Arizona, the road crosses the "Black Forest" and the pine belt of the San Francisco mountains and enters the silver district at Hackberry, 100 miles further west. Running thence down the Hualapai valley, it skirts the eastern base of Cerbat Range within 12 miles of Mineral Park, the county seat, from which point, within a radius of eight miles, there are more than 2,000 mining locations, many of them showing large bodies of ore—gold, silver, argentiferous galena, and copper carrying both silver and gold. Embraced within this area are the camps of Chloride, Cerbat, Todd Basin and Stockton, all within 15 miles of the railroad survey. Each of these camps has supported since 1871 a goodly population of

Miners Who Have Held Their Claims

Year after year with firm belief in their future value. During this time prices of provisions and material have been higher than in any other mining district in the United States, and the cost of shipping or milling ore so great that nothing less than $200 per ton left a margin to the miner. And yet, these men have lived comfortably on the product of their mines, and in many instances made a handsome surplus. None of the mines are prospected to a depth, most of the ore having been taken from the "croppings" where it could be mined at the smallest cost. To give an idea of the character of the vein formations, etc., it will be necessary to describe some of the locations in each of the above named camps. Leaving the other points for a future letter, I will close with a brief description of some of the

Stockton Mines

On the east side of the Cerbat mountains, eight miles by good road from the line of the railroad survey, and 20 miles by same road from an inexhaustible supply of fine timber. The average of all ores milled from Stockton is above $300 per ton in silver. The formation is feldspathic granite with dykes of true porphyry forming one wall of many veins. The strike of the main lodes is northwest with many smaller strata putting into them at various angles, and generally with an obverse trend. These small strata are frequently very high grade, and the difference in dip indicates that they are feeders to the large veins. The Cupel mine has 150 tons of ore on the dump worth $100 per ton. It has produced $150,000 from ore already milled. There are but 330 ft. of shafts and drifts from which, and open cuts, the ore was taken. Work just resumed, shows in bottom of 130-ft shaft 12 to 16 inches of ruby silver ore worth $400 per ton. The Franklin mine is a 30-ft. vein. The last ore from a 2-ft. pay streak milled $476 per ton silver, and 62% lead. The Little Chief has netted its owners $8 per day for all work put upon it. There are 600 ft. of shafts and drifts, and considerable stoping has been done. Value of ore from $600 to $1,500 per ton. The group of 8 mines owned by Robert and Thomas Gray are especially worthy of mention, lying within a radius of one mile and all accessible by the same road, they possess advantages for economical working as well as in quality and quantity of ore seldom equalled. Beginning with the Silver Monster, near the summit of the mountain, 1,500 ft. above the valley, we find the immense croppings of the Cincinnati mine, owned by the Fairfield Co., extending 800 ft. on this ground, and assaying from $30 to $180 per ton. A shaft 60 ft. from the north boundary shows at a depth of 50 ft. 10 ft. of fair milling ore. At 110 ft. the shaft and a crosscut now in 6 ft., is wholly in clean ore, averaging $50 to $60 per ton. The vein is perpendicular. The Miners' Hope, on the same ledge, has two shafts 20 ft. and 35 ft. deep respectively, which have produced 30 tons of ore milling from $160 to $375 per ton. The vein has an even width on this claim of 15 ft., with smooth walls of porphyrite. The casing of taloite is wholly on one side, leaving the ore on a hard wall—a good indication of permanency in an ore body. Lower down the mountain is the Blue Bell, a 12-ft. vein, with several feeders in close proximity. The deepest shaft is 40 ft., and has produced 40 tons of dressed ore, part of which sold in San Francisco for $260 per ton, 30% being gold. The ore streak averages 4 ft. in shaft, and good ore is traceable the whole length of the claim, 1,500 ft. The northwest extension, known as the Fremont and owned by a Chicago company, has produced considerable ore, milling as high as $650 per ton. The Fountain Head, belonging to the same group of mines is 15 ft. between hard, smooth walls. It carries 40% lead and shows ore for 1,000 ft. on the croppings. The average of the ore streak where opened is 2 ft., assaying, dressed, $70 in silver. The Pure Metal is an extension of the Capel mine. It is perpendicular and 4 ft. between walls, carries 50 ozs. silver and 60% lead; pay streak from 1 to 2½ ft. thick.

The Tigress is the last of the group worthy of mention. It contains only 600 linear ft., is 12 ft. wide, with an ore streak 1 to 2 ft. thick, milling, dressed, from $150 to $400—30% lead. One hundred and fifty ft. of shafts and drifts have afforded 150 tons of ore without stoping. Ruby and native silver are found on the croppings. The lead increases with depth. This vein lies flatter than any of those before mentioned. The trend is 65°; hanging wall, a gneissoid rock; footwall, porphyry. Many other locations at this point show equally as good prospects, while others that have afforded much high-grade ore have been so gouged on the surface and carelessly worked, that it is difficult to judge of the appearance of the veins.

W. M. Ewing.

Mineral Park, Arizona, Aug. 13, 1881.

Poorman's Mining District.

Editors Press:—I herewith send you some notes in the belief that there must be many mining men who are looking anxiously toward this far-off section of the State, and who no doubt believe that increased railroad facilities will stimulate prospecting and mining in the mountains bordering the great desert and on the Colorado river.

Our camp is situated 15 miles west of the Colorado river, and also 15 miles north from the Southern Pacific railroad, with perfect natural roads to both places over hard, smooth mesa country, with no hills intervening. We are five miles east from the base of the Mesquit mountains, in some low foothills, the highest being less than 100 ft. in hight. The principal locations are on the Luz ledge, which is about 25 ft. wide, cropping up through the mesa for a distance of 7,500 ft., or five full locations. The contact nature of the vein is apparent at the first glance, for to the south pure gray granite is all that is visible so far as the low hills appear above the mesa, while north all is red and yellow porphyry. The ore is mostly milling silver quartz, but also carries galena of a good smelting quality. We have assays of the galena going 29 ozs., 87 ozs., 141 ozs., 186 ozs. silver, with about 6% lead, being all averages at the different depths; and from the quartz at the various levels and cuts has gone on an average 10.2 ozs., 12.4 ozs., 36.35 ozs., and 89.40 ozs. and 145.9 ozs. silver.

We now have an incline down on the granite foot wall on the Amelia mine to the depth of 65 ft., from which we have taken some six tons of galena and quartz. On the Paymaster mine we have a straight shaft on the vein about 15 ft. deep, from which we take the same character of ore; on the Boston there is some very fine carbonate of silver and lead; on the Florence Eaton we have still the same massive quartz outcrop, but no development. Next we come to the Luz mine, from which the ledge derives its name. Here we find the most work done, there being one 50-ft shaft, one 20 ft. and two each 10 ft., all on the ledge, but none of them being on either hanging or foot wall. From this claim several tons of galena were shipped to San Francisco between 1875 and 1878, since which time the camp has been abandoned on account of lack of transportation and the expensiveness of mining in general in this remote country at that time. But now all is changed.

We can now have goods of all kinds laid down almost at our very doors at a very slight advance on city prices; we can ship ore and get returns almost immediately; we are blessed with one of the finest climates in the United States, for nine months working in the open air is a pleasure, the mercury never getting down to the freezing point, and the other three months in summer all that is necessary for outside work is a good shade. We are not troubled with water in the mines, and for that reason very little timbering is necessary. Wood for fuel is plenty around the mines—iron-wood and palo verde, and on the Colorado river hottom all the cottonwood and willow necessary for building and other purposes. For water we have large natural tanks in the hills, four and seven miles from the camp, and when they give out, we pack water from the river without trouble.

There are about 25 claims located in the district, but only five or six of them are being prospected at present. Taking into consideration the situation of the camp, the well defined contact character of the ledge, the width of the ledge and the established character of the ore, we have some of the best properties in all this lower country. Arthur H. Douglas.

Poorman's Mining District, San Diego Co., Aug. 17, 1881.

California Gold Nuggets.

Editors Press:—I see in the Press of this week an interesting article on "Gold Nuggets," which gives the locality and value of foreign nuggets. I suppose in the continuation of the articles other nuggets will be enumerated; and desiring to add to the information on the subject, I send you a list of California nuggets. Part of these I mentioned in an article in the Mining and Scientific Press some years ago, but a number of others are here given. I may add that many of these nuggets I saw myself, and I have visited all the localities mentioned and gained the particulars, being interested, so that most of my information is from personal observation.

I will now commence with the different counties in which the nuggets were found:

Siskiyou County.—In a gulch near the Klamath river, a short distance above Groot's Ferry, some years ago, a nine-pound lump of almost pure gold was found; and at various times numerous smaller ones, weighing from a few ounces upward, have been discovered.

Trinity County.—In 1870, on Little Mule creek, near Minersville, in gravel diggings, two nuggets of solid gold were found, one weighing eight pounds, avordupois, the other about eleven pounds. In 1873, on Buckeye Mountain, so-called, a dry gravel ridge, lying between Rush Creek and Stewart Fork, two nuggets of solid gold were found, one weighing three and a half pounds, avoirdupois, the other nearly ten pounds.

Shasta County.—In 1870, on Spring creek, near the town of Shasta, in gravel diggings, a nugget of almost pure gold was found, which weighed fifteen pounds four and a half ounces, valued at $3,200.

Sierra County.—At French Ravine, at various times, large nuggets have been found. In 1850, a mass of quartz and gold, weighing about 36 pounds, over half of which was gold; in 1851, a mass of quartz and gold, worth about $8,000 besides numerous smaller ones, weighing a few ounces and more; in 1855, one of quartz and gold, valued at $10,000; in 1860, one worth $1,760, and in 1866, one was found valued at $1,575.

At Smith Flat, a short distance above the last locality: In 1861, a mass of quartz and gold worth about $1,500; in 1864, one weighing about 140 ounces, and with but very little quartz; in 1866, one weighing about ten pounds, most of which was gold.

At Forrest City: In the Live Yankee claims, from 1854 to 1862, twelve nuggets, some of them very interesting specimens, were found, weighing from 30 to 170 ounces each. The Oregon Co.'s claim, adjoining the last, furnished, between 1856 and 1862, numerous nuggets weighing from 30 to 100 ounces. In other claims in the vicinity numerous large ones have been found. In the Hope & Co. claims, four miles below the Mountain House, a nugget of almost pure gold, valued at $1,770, was taken out in 1864; in 1878, a nugget of gold was taken out of Bald Mountain, weighing five and a half ounces; also, another weighing fifteen ounces.

In Minnesota, Sierra county, at various times, numerous large boulders have been found, some yielding over $5,000. In 1869, a nugget of almost pure gold, worth about $2,000, was found at the Little Grizzley diggings. The same year the Monumental Q. M. Co., at Sierra Buttes, took out a piece of quartz and gold worth some $30,000, according to reports.

Nevada County.—At Remington Hill: In 1855, a nugget of quartz and gold, worth $3,500; in 1867, one worth about $2,400; and at numerous times various pieces, weighing a few ounces and more, have been taken from the same hill.

At Lowell Hill, in 1865, a mass of quartz and gold, worth about $1,100, was found, besides numerous smaller ones at different dates.

El Dorado County.—In the vicinity of Pilot Hill, various boulders of quartz and gold have yielded large amounts; one, in 1867, yielded about $8,000.

One of the most beautiful specimens of dendritic crystallized gold which has, perhaps, ever been found in the world of its size, was discovered in El Dorado county, and you gave an engraving of it some time since from a photograph by C. E. Watkins. It was found in a seam of decomposed quartz, between the slate, at a depth of about 60 ft. from the surface, in August, 1865, at what is known as the "Grit" mining claims, in Spanish Dry Diggings, El Dorado county, Cal. It weighs about 16 lbs., and is valued at $3,500. Although much larger nuggets than the one described have been found in this State and in Australia, so far as ascertained, none have been found presenting such a remarkably beautiful appearance. The gold branches out in the form of offshoots like the branches of trees.

Strange to say, this beautiful specimen was not retained in California, but was taken to Paris. It was exhibited at the Paris International Exposition, in 1868, and was much admired and appreciated by those who had the pleasure of seeing it.

This county has produced at various times numerous smaller nuggets from a few ounces to a few pounds.

Placer County.—In 1864, on the middle fork of the American river, two miles from Michigan Bluffs, a fine large mass of almost pure gold was found, which weighed 15½ lbs.

Calaveras County.—In the quartz claims at Carson Hill, numerous masses of gold, weighing from six to seven lbs., have been found. In November, 1854, a nugget of quartz and gold was discovered in this county, which weighed 195 lbs. Troy, valued at $37,400. This is the largest piece ever found in the State.

There is no doubt but that many other large masses of gold have been found in the State, and it is to be regretted that we have no full list. What a pity for the cause of science that *facsimile* casts of these nuggets were not taken at the time, so that they could have been preserved.

C. D. Voy.

Grafting Flesh.

We take from the account in the Oakland *Tribune* the following facts concerning the remarkable cure of Frank Leavitt, the locomotive engineer, who, it will be remembered was so severely scalded by the overturning of a locomotive near Leadville, Colorado, on the Denver and Rio Grande railway. Pieces of his flesh were so scalded that they were cut off by the surgeon. One piece was cut from his thigh 10 inches in length, and four or five in breadth. To repair this three of Mr. Leavitt's friends offered themselves to the surgeon's knife, and pieces of their flesh were cut off and grafted on to the wound. Mr. Leavitt was found seated in an easy chair by the window and gazing into the street. "After the accident," said he, "I was taken to South Pueblo, which is about 10 miles from Leadville. For about four days I felt little or no pain. Then

The Scalded Places

Began to hurt frightfully, and the doctors found it necessary to cut out a large piece of my thigh. Yes, the wound in places went clear into the bone, leaving a large hole. Dr. Craven and Dr. Christie, who were attending me, said that it was necessary to graft the open wound with new flesh and skin in order to build it up. You see, a small hole will naturally fill up and skin over without help, but this was too large to get along without some help. The doctors would have taken some of the flesh of my arm and use it, but that I was in a feverish condition at the time, and three of my friends who worked with me offered to allow the doctor to use them to help me out. How was it done, eh? Well, simply enough. The surgeons just took hold of the man's arm with a pincers, and pinched up a little piece of skin and flesh, not much bigger than a dime, as you may say, and then just slit it off with a knife. How many pieces? Well, they cut off from these three men twenty-seven of these small pieces altogether, but, of course, not at the same time. No, it

Didn't Hurt the Men

Particularly. These small pieces of skin and flesh were then taken and laid on separately on the wound—each one to act as a kind of center, you know, for the new skin and flesh to build up around. Of course, they wouldn't begin to fill up the wound, but each piece acted like a graft, and began to grow out toward the others until the intervening spaces were filled up. It took quite a long time to get all the grafts on. Some five or six were put on at one time, and it took them about three days to unite. Some of them did not unite at all, but fell off at the first dressing. No, I couldn't tell exactly when the pieces became a part of me, for I couldn't touch them because of the dressing and bandage. The pieces were just laid on the wound, and bound firmly on with a bandage smeared with some healing mixture or salve. When they didn't fall off on the third day, when they came to dress the wound, there they were and there they stayed, and that was all I knew about it. The place will never be filled up quite level, but it is perfectly sound and whole now, although a little raw and sore, of course, and I am able to walk about with a crutch, and I expect to be able to go to work in about three months.

As Well as Ever.

"The company has been very good to me. I have been on full pay ever since the accident, on the 3d of last May, and they gave three months' leave of absence on full pay to the men whose arms were cut. The accident happened on the 10-mile extension of the Denver and Rio Grande railroad, near South Pueblo. The grades are quite steep there, and the curves very sharp. We were coming down at a pretty good rate, and just rounding one of the curves, when of a sudden I felt the engine moving sideways under me, and then in an instant it went plunging down the steep embankment almost upside down, but not before I had time to clap on the air-wheels and reverse. This must have saved the lives of the passengers, for none of them were hurt much, and the fireman jumped off before the engine broke loose. At the bottom, I was found lying, pinned under the boiler-head, so I couldn't get out, but not crushed. The steam was escaping and burning my back and legs terribly. I shouted to them to pull me out, and they did pull for a minute or two, and then quit, thinking they would pull my arms out of the sockets. I did not care if they did, so long as they got me out of that, and finally they did drag me out more dead than alive. Yes, sir; I was 78 days in bed."

The assessment on Con. Virginia is the 16th to be levied by that corporation. The last one previous was levied June 11th, 1873. The mine has been assessed $411,200, and has paid 53 dividends, amounting to $42,930,000. The last dividend was declared Aug. 16th, 1880. The fifteenth assessment was levied June 11th, 1873.

MECHANICAL PROGRESS.

Steam Engines for Electric Lighting.

With the adoption of the electric light a demand has arisen for engines to drive the dynamo machines by which static electricity is produced. So far as we are aware, the chief design of engineers has been directed to making engines that will perform continuously at high velocities without heating, but it seems to us that this is only one function of such machine, and not the highest. Where the dynamo only is driven directly by the engine, fluctuations in speed are not so noticeable as where it is connected indirectly by a belt and the engine has other duties, such as driving elevators or other machines about the premises.

On account of the cost of electric lights produced by steam, it is essential that their engines should have high economy, which means an early cut-off as an element, doubtless occurring at some point previous to half stroke. As they are at present constructed, during the other half stroke they will show such changes in speed as variations in the load may induce. Therefore, an electric light engine should have such an excess of power that there will be sufficient stored in the fly-wheel to carry without sensible change of speed, any sudden increase of load that may occur when the steam is working expansively. Whether under these conditions it is cheapest to have a special engine for the dynamo, or one engine for both duties, it is not our intention to discuss. We do say, however, that it may be advantageous to so design engines for dynamos, in connection with other work, that they shall be able to increase their power during the expansion period, if an increase of load occurs to render it necessary.

Suppose, for example, that instead of the governor ceasing to control the valve after the point of cut-off, it is so constructed as to control it during the whole stroke.

Thus, expansion has commenced and a sudden increase of load occurs; would it be an advantage to gear the governor so that it would again admit live steam, thus increasing its power to drive the increase of load?

This would of course add to the fuel consumption, in order to proportion the engine to its load, but fuel consumption is only one of the elements in securing commercial economy. We present this question for the consideration of engine builders.—*Mechanical Engineer.*

Relations of Oil to Power.

The function of an oil, when used to lubricate, is to lessen friction, and the more perfectly it is done, the more thoroughly is its purpose accomplished. Exactly why oil should be a lubricant any more than water or a mucilaginous or emulsive body has not yet been determined, and what its molecular condition has to do with it is not yet definitely ascertained. Oil applied between two surfaces or bearings, fills the superficial pores of the metal, and forms a film between the surfaces, and thus keeps them apart, and the particles of oil are made to move amongst themselves and keep these surfaces from absolute contact.

Too little attention is paid by users of machinery to adapting the quality of the oil to the work to be done; for instance, the cotton or woolen mill which uses lard or so-called "heavy" oil on their engine and spindles, would find the latter absorbing or destroying much of the power of the former, simply in overcoming the resistance due to the viscosity or "heaviness" of the oil itself, for we must remember that the absolute resistance of the spindle is but slight; adhesiveness due to the oil itself, would almost equal the normal resistance of the unoiled spindle. Then, again, the tendency to gum or thicken of the oil in question, adds to its undesirability, and when we see this resistance multiplied by the thousands of spindles at work, we can imagine the drain of power simply in overcoming the resistance of the oil. Paraffine oils, and other refined derivatives obtained from petroleum, are peculiarly adapted for all this work—heavy or light—for by a judicious admixture of them with animal oils for the purpose intended, an oil may be obtained suitable for any work. In this class of oils the tendency to gum or oxidize is checked, as the petroleum holds in solution the other oils, and being non-evaporative and non-oxidizing itself, it imparts those properties to the oils in combination.—*Northwestern Miller.*

A NEW STEAM BOILER.—A recent Glasgow patent is for a steam boiler composed of two cylindrical shells, united end for end, but not upon the same axial line. One of these portions is situated over the furnace, and is externally fired; the other portion contains tubes, through which the products of combustion pass. The two sections are bolted together by strong bolts, extending through from the front to the rear end. The end which is externally fired is raised sufficiently high above the axial line of the other sections to allow the production of combustion to heat the crown sheet, and then pass off through the tubes of the second section.

A USEFUL packing for steam engines, pumps, etc., is at present being made by thoroughly incorporating paper pulp with plumbago, and subsequently forming it, under strong pressure, into sheets or rolls.

American Cast Iron.

Foreign engineers often speak contemptuously of some American works, says the *Mechanical Engineer*, because the details of them are cast iron, implying by this that they are neither strong in the first instance nor serviceable in the last. If American cast iron was the same in character as foreign cast iron, the objections noted might have some force, but it is so vastly different as to be virtually another metal. It is not only stronger per square inch of section, but the limit of elasticity is higher. Cast iron in English text-books is stated to have a tensile strength of 25,000 pounds per square inch, but American iron especially ordnance or gun metal, will stand 39,500 pounds to the square inch of section. This is of course a special mixture, but it is a result reached in cast iron.

By reason of this great strength of American cast iron, we are enabled to use it successfully in car wheels and for locomotive drivers. This is to the average English engineer an incomprehensible thing, as all, or by far the greater part, of the drivers and car wheels used there are wrought iron.

English locomotive cylinders fail much oftener by cracking than ours do, notwithstanding the fact that the nature of their road beds and uniformity of climate are vastly in favor of durability. It is possible, also, to use a greater degree of shrinkage in machine parts, so connected, with American cast iron than in English material of the same kind.

Whether the result thus obtained by American irons are due to their native purity as ores, or better processes of smelting, we do not propose to discuss here; it is the greater value of American cast iron as constructive material, compared with European cast iron, that we deem noteworthy, and as an explanation of its employment with us for important details.—*Boston Manufacturers' Gazette.*

FUSIBLE BOILER PLUGS.—At one time the safety of a boiler, so far as concerned any danger arising from low water, seemed reasonably well assured by the fusible plug. Experience has demonstrated, however, that this, like other so-called safety devices, is not to be depended upon. In some instances, the material of which the fusible portion of the plug is made seems to gradually lose its nature, or, more probably, the base of the metal gradually wastes away, its place being occupied by lime and other deposits, until it is well nigh impossible to melt it. In other instances, it becomes covered with scale and dirt, making it highly improbable that it will melt until the heat becomes dangerously high. So uncertain is it at what temperature such plugs will melt that as safety devices they are of little use.—*American Machinist.*

SCREW MANUFACTURE.—One of the most interesting of mechanical processes is the making of screws. The wire in large coils is made, by being drawn through a hole smaller than itself, the size required. It is next introduced to a machine, which at the same time cuts off the desired length and "puts a head on it." It is next put into sawdust and "rattled" and brightened. The head is then shaved down smoothly and the nick made. Now comes another "rattling" in the sawdust, after which the thread is cut by a machine, and after again "rattling" and drying the screws are assorted by hand, grossed by weight and packed for shipment. This work is sometimes performed by curiously devised automatic machinery.

IMPROVEMENTS IN ROLLING IRON.—Much ingenuity has been brought into exercise by iron workers in devising means to obviate the great exposure to heat and expense of manual strength required in handling the blooms of iron or ingots of steel between the furnace and final process of rolling into bars or rails. Mr. Chris. Lewis, formerly superintendent of the Locbiel Works, near Harrieburg, Pa., has recently invented and put in practical operation a system of automatic machinery, by the use of which the services of only one man are required to pass the heated steel ingot from the furnace through the entire series of rolls to the rail straightener.

IRON SHIP BUILDING IN AMERICA.—The *North American*, in speaking of iron ship building in America, says that, notwithstanding the business is treated lightly by New York writers, it is nevertheless making very steady progress. Every establishment on the Delaware river has been very actively employed for the year past, and the prospects ahead are quite satisfactory. Still the capacity of these establishments has never yet been fully tested, and if they all could get contracts as fast as they require them, they could easily turn out double the amount of tonnage they now do.

TO REMOVE GEAR WHEELS.—To get a gear wheel off a shaft, upon which it has been shrunk, take it to the foundry and pour some melted iron around the hub, and it will heat and expand so quickly there will be no time for the shaft to get hot, and the gear will come off easily.

THE rim of the homogeneous car wheel, as it is called, is cast from melted scrapa of wrought iron and steel. As soon as it has cooled sufficiently to "set," it is taken from the mold and placed in another, and the center piece is cast of the best wheel iron. The two metals are thus firmly welded together.

SCIENTIFIC PROGRESS.

The Tails of Comets.

Just at this time scientists are studying with much interest, and under unusually favorable circumstances, the peculiar phenomena connected with comets, and doubtless a large amount of new and valuable material in that direction will be presented at the meeting of the American Association for the Advancement of Science, now in session at Cincinnati. The most characteristic, and at the same time, the most inexplicable of all the phenomena connected with these bodies is the constitution and movements of what is known as their "tails." One of the latest and most novel theories advanced in regard to that appendage is that of Camille Flammarion in a paper recently read before the French Academy of Sciences, on the comet which has just disappeared from our view. The theory seems to come nearer to meeting all the conditions involved than, perhaps, any other hitherto put forth; yet, to accept it, we must admit that there are forces in nature of which we are yet ignorant. We copy, substantially, as follows:

In my observations on this comet I have devoted myself principally to an examination of its physical aspect. This examination appears to lead to conclusions which are different from the opinions generally adopted as to the nature of cometary tails. . . . The perfect transparency of these trains of light leads us to think they are *not material*, that they are not gases driven back into space by a repulsive solar force, but that they are an excitation—electric or otherwise—or either produced by the mysterious star, on the side opposite from the sun, we might almost say in the line of its shadow!

On the 24th of December, 1811, Piazzi observed at Palermo, through the tail of the celebrated comet of that year, the stars which, instead of being more or less obscured, were seen to be *more luminous*. . . . Apropos of these unexplained physical phenomena, let us dwell for a moment on the assuredly extraordinary circumstance which occurred last year, and which was only the renewal of one of the same kind observed already in 1843. On the 28th of January, 1880, the great comet discovered in the Southern hemisphere passed to its perhelion at 150,000 miles only from the solar surface.

The proximity was more surprising still on the 27th of February, 1843. The two celestial bodies brushed each other at 33,000 miles only—that is to say, the comet traversed the solar atmosphere at a light less than that of the corona, and even of that of the protuberances, several of which have been ascertained to measure 200,000 miles in hight. Now at these two epochs the comet was accompanied by a narrow and rectilinear train, which it carried with it always on the side away from the sun, and which stretched out 125, 150, and even 200 millions of miles in length. To make in two hours a half revolution of the sun, it rushed along with a velocity of within a fraction of 32 miles per second. Now at the distance of the earth, 95 millions of miles—a rectilinear and rigid tail must have swept space with a velocity of 3,716 miles per second. [The actual visible extremity of the tail of that comet, which extended into space many millions of miles beyond the earth's orbit, must have swept around at a rate of not less than 100,000 miles per second. An actual translation of matter at such a speed is absolutely beyond our conception, and cannot be admitted into any human philosophy.—EDS. PRESS.]

Does not this circumstance, which has presented itself to our eyes twice in 37 years, taken in connection with the perfect transparency of these trains of light, lead to the consequence that *the tails of comets cannot be material?* Is it an undulatory motion excited by the comet itself on the side opposite from the sun? We do not as yet know all the forces of nature.

Prof. Davidson's Views.

Previous to the announcement of the above, Prof. Davidson, of this city, read a lengthy paper before the California Academy of Sciences, in which the same theory as that announced by M. Flammarion was distinctly set forth. In studying the recent comet from his observatory in this city, in connection with similar phenomena previously noticed, the Professor has arrived at the following hypothesis:

"That whilst there may be matter emitted from the nucleus of a comet as necessitated by the development of the nucleus and the formation of the envelopes when the comet is approaching the sun; and that part of such matter may follow in the course of the orbit; yet the principal cause for the exhibition of the tail is this: That the light rays from the sun, in passing through the matter of the envelopes surrounding the nucleus (so intensely heated when the comet is close to the sun) become so changed in their wave-length, that the ethereal medium itself becomes luminous and visible in the prolonged line of their passage.

"In my judgment this hypothesis, or some modification of it, will account for many, and perhaps all, of the phenomena referred to, may embrace some of the phenomena of the corona of the sun, and even of the zodiacal light. It overcomes the hitherto insurmountable difficulty of the actual translation of matter at such enormous velocities."

This bold proposition opens a wide field for speculation, inasmuch as it takes the phenomenon from the scope of our terrestrial view, and gives it a cosmical breadth. Prof. Davidson is preparing a popular paper on the subject of comets, which will be looked for with much interest.

A NEW EXHILARATING SUBSTANCE.—Dr. Luton, of Rheims, calls attention in a French medical paper to the exhilarating properties of the tincture of ergot of rye when associated with phosphate of soda. The circumstances of the discovery were as follow: A woman of 62, at the infirmary of the *Maison de Retraite*, in Rheims, was receiving tincture of ergot of rye for disease in the knee. Fearing an unfavorable turn, the doctor thought to strengthen the action of that medicament with phosphate of soda, and accordingly combined a little of the two substances in a quarter of a glass of sweetened water. The patient, about three-quarters of an hour after taking this, surprised the inmates by bursting into loud laughter, without obvious reason, and this continued for more than an hour, with brief intervals. The laughter seemed to be associated with merry ideas, and to indicate a kind of intoxication. For some time after it died down the woman was in great spirits and good humor. Dr. Luton had not witnessed the scene, but the consequences to the patient being good, he administered the substance again, and a third time, observing the same effect. The experiments were further repeated on seven or eight women and girls with like results. In the case of men the action of the substance is less marked; it appears only in coloring of the face, giddiness and slight headache. The effects in question have probably a common origin, it is thought, with those from eating rye bread when, in rainy years, the cereal contains as much as 5% of ergot. A sort of intoxication is produced which the consumers by no means despise.

AN INTERESTING DISCOVERY has been made by Loew on the presence of free fluorine in fluorspar. As fluorine is the only element which, though well known through its compounds, has never yet been isolated, the matter deserves attention. A certain variety of fluorspar, of Wolsendorf, Bavaria, dark violet in color, has always been remarkable for its peculiar odor, and various theories have been advanced by scientists to account for it. Loew came to the conclusion that it might be free fluorine; and, to test his hypothesis, he ground a kilogram of Wolsendorf fluorspar with water containing ammonia, using small portions at a time, the filtrate and wash-waters from the earlier being used with the later quantities. The last filtrate was mixed with sodium carbonate, evaporated, the residue treated in a platinum capsule with sulphuric acid, and, covered with a watch glass, kept at 40 to 50 degrees for a long time. On examining the glass it was found to be very considerably corroded. Since fluorspar is not entirely insoluble in water, the experiment was repeated, using the inodorous mineral. The result was so exceedingly feeble as to dispose entirely of this objection to the former result. Since these dark radiated varieties of fluorite contain cerium, the author thinks a ceric fluoride is the source of the free fluorine, by dissociating into cerous fluoride and fluorine, analagous to the decomposition of manganese tetrachloride at ordinary temperatures.

ABSOLUTELY INSTANTANEOUS PHOTOGRAPH.—Probably nothing, since the production of the famous photographs of Watron of horses in motion, has attracted more attention in that line than an exhibition now being made in New York of a photograph taken by an army officer with Anthony's instantaneous collodion. An old army mule, condemned to death, was killed by a small charge of dynamite placed on his neck and exploded by electricity. The picture represents the mule standing with his head entirely blown off, and the rope with which he was tied to a short stake in the ground in the same position that it was in when tied to his head, as it had not time to fall to the ground. The slide of the camera was dropped by the same charge of electricity that exploded the dynamite.

BURSTING POWER OF ICE.—Ed. Hagenbach experimented, during the past severe winter, upon the bursting force exerted in the expansion of water when freezing. Two interesting experiments were made with cast-iron hand grenades. The outer diameter was 15 centimetres (5.9 inches), the inner diameter 15 centimetres (5.04 inches). The shells were filled with water, closed with a screwed iron plug, and exposed to the cold. Both shells were broken and a curved thread of ice was projected, by means of an ice column, from the upper surface. One of the plugs was evidently thrown out with great violence, and to such a distance that it could not be found. The curvature in that case was bent upward.—*Wiedmann's Annalen.*

SCIENTIFIC TRUST FUND.—When Professor Tyndall was about to leave this country he left a fund for "the assistance of needy American students in physics who should show aptitude for original study and should wish to complete their education in Germany." It is stated that the fund has now accumulated sufficiently to furnish a moderate income to two students.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 11		Week Ending Aug. 18		Week Ending Aug. 25		Week Ending Sept. 1.	
Alpha	4.05	3⅞	4¼	3.85	4.40	4⅛	4	3.55
Alta	4.05	3.90	4.35	4.10	4.15	3.80	4.05	3.90
Andes	1.45	1	1.40	1	1.30	1.15	1.20	1.05
Albion	2.10	1.55	2.10	1.80	1.90	1.55	2	1.70
Argenta	15c	....	....	....	....	....	....	....
Addenda	10c	5c	30c	15c	30c	25c	25c	20c
Belcher	3.10	2.35	3¼	2.90	3.30	3.10	3.05	2.80
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	10½	9⅜	13	10⅜	12⅜	12⅛	13⅛	11⅛
Bullion	60c	45c	70c	50c	1.45	70c	1.20	1.10
Bechtel	1.45	1.30	1.30	1	1.15	1.05	1 30	1
Bel Isle	20c	15c	20c	15c	20c	....	20c	....
Bodie	7¼	7	10½	7⅜	9⅝	8⅜	9¼	9
Benton	95c	90c	1	95c	1	85c	95c	90c
Bulwer	2¼	....	3½	3	....	....	2⅛	2.40
Boston	30c	....	30c	25c	....	....	....	....
Black Hawk	10c	5c	30c	5c	25c	20c	25c	20c
Belvidere	45c	....	50c	....	50c	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	40c	10c	40c	30c	45c	40c	35c	30c
California	1	90c	1.05	90c	1.10	1	1.05	1
Challenge	93c	75c	95c	90c	95c	90c	80c	....
Chollar	2⅛	2.10	3.10	2.15	3.05	2⅛	2⅛	2.30
Confidence	4	3⅞	4¼	4¼	4	3.85	3⅞	....
Con Imperial	15c	10c	20c	15c	20c	15c	15c	10c
Con Virginia	2	1.85	3.35	1.50	2.30	2	2.05	1.90
Crown Point	2⅛	1.90	2⅛	2	2⅛	2.10	2.10	1.90
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	75c	50c	1.60	1⅛	....	....	1⅛	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	40c	20c	70c	50c	75c	60c	60c	40c
Derbec	....	....	....	....	....	....	....	....
Day	2.65	2⅛	2⅛	2	2.45	2⅛	2.35	2⅛
E. Mt. Diablo	16c	15c	15c	....	15c	....	20c	15c
Eureka Con	25	23⅛	29	28	....	....	28	26⅛
Exchequer	1.15	1.10	1⅛	1.10	1.30	1.10	1.35	1.15
Endowment	....	....	....	....	....	....	....	....
Grand Prize	20c	15c	15c	10c	15c	....	30c	....
Golden Gate	2⅛	....	3.80	2⅜	....	....	2⅛	....
Goodshaw	45c	40c	65c	25c	65c	60c	55c	35c
Gould & Curry	5⅛	4.80	7⅜	4.95	7⅜	6⅛	7⅜	6⅜
Hale & Norcross	3.10	2.95	4.35	3.30	4.40	3.80	4.20	3.80
Head Center	....	....	1	....	1	....	1	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	30c	....	40c	30c	45c	35c	45c	40c
Justice	85c	75c	90c	80c	85c	75c	80c	75c
Jackson	75c	50c	....	....	75c	....	....	....
Jupiter	10c	....	20c	15c	25c	....	....	10c
Kentuck	3	2⅛	3	2⅜	3	2.10	2.10	2
Kosuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	25c	15c	20c	....	15c	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	30c	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2	....	2	....	1⅛	....	2	....
Martin White	25c	....	....	....	30c	20c	25c	....
McClinton	....	....	20c	10c	10c	....	10c	....
Mono	2⅛	2.30	4.35	2.65	3.90	3.75	3.50	3⅛
Mexican	8⅛	7⅞	9¼	8⅜	11⅜	10⅛	10⅞	9⅛
Mt. Diablo	....	....	7	6½	....	....	6	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1	90c	1¼	1.10	1.55	1	1	90c
New York	10c	....	20c	10c	20c	10c	15c	10c
Northern Belle	15	14	15⅞	14⅜	15⅞	14⅜	16	15⅛
North Noonday	55c	50c	90c	55c	70c	55c	65c	....
Navajo	75c	70c	65c	....	65c	....	40c	....
Occidental	1.35	1.30	2	1⅛	1.80	1⅛	1.90	1⅛
Ophir	5⅜	5	6⅜	5⅛	7⅜	6⅜	6⅛	6⅛
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.20	1.10	1.40	1.05	2	1.20	1.90	1⅛
Oro	55c	50c	70c	45c	50c	45c	50c	45c
Paris	....	....	40c	....	25c	....	....	....
Potosi	2.65	2.45	3⅛	2.55	3.35	3	3.20	2⅛
Queen Bee	....	....	10c	5c	....	....	5c	....
South Bulwer	....	....	80c	25c	....	....	....	....
Savage	2⅛	2.40	3⅛	2.40	3.85	3.10	3.30	2.90
Seg Belcher	5⅛	5	6	5	6½	....	6⅛	6
Sierra Nevada	9⅛	8⅞	13⅜	8⅛	17	13⅞	17	13⅛
Silver Hill	15c	10c	20c	10c	15c	....	15c	10c
Silver King	20⅛	20⅛	20⅞	20	20⅛	20	20⅛	19⅛
Succor	....	....	....	....	....	....	....	....
Summit	25c	....	50c	....	25c	....	25c	....
Scorpion	1.40	1⅛	1⅛	1.35	1.80	1.15	1.70	1⅛
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	10c	....	5c	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	50c	40c	90c	45c	50c	....	45c	40c
Tioga Con	25c	....	1.05	40c	45c	35c	40c	....
Tiptop	5⅜	5⅛	6	5⅛	5⅜	5⅛	6	5⅛
Tuscarora	....	....	25c	20c	....	....	....	....
Union Con	10	9⅜	12	9⅛	14⅜	11⅛	14⅜	10
Utah	8⅜	8⅛	11⅛	8⅛	11⅜	10	11⅞	9⅛
Ward	2.40	....	2⅛	....	....	....	....	....
Wales	1.10	50c	80c	50c	75c	50c	75c	60c
Yellow Jacket	5⅛	4.40	6⅛	4.95	6⅜	5⅞	6	5⅜

Sales at S. F. Stock Exchange.

Thursday A.M., Sept. 1.

		10	Seg Belcher....6⅛
		210	Utah....10@10
355	Alta....4@3.95	770	Union....12⅜@12½
70	Andes....1.10	300	Yellow Jacket....5⅜
465	B & Belcher....12½@12⅜		AFTERNOON SESSION.
20	Belcher....2.90	235	Albion....2.10
290	Cou Virginia....1.95@2	510	Bodie....9⅝@9⅞
40	Chollar....2.35	10	Bulwer....2⅛
250	Crown Point....1.95@2	100	Bechtel....1.15
550	Con Imperial....10c	100	Bodie Tunnel....2⅛
20	Confidence....3.80	50	Concordia....1⅛
100	Exchequer....1.20	300	Day....2.30
450	Gould & Curry....7⅜@7⅛	310	E Mt Diablo....15c
140	Hale & Nor....3.90	100	Grand Prize....35c
250	Justice....75c	100	Giant & O A....1.60
100	Julia....40c	150	Manhattan....2
380	Mexican....10	200	Mono....3.35
500	New York....15c	80	Mt Diablo....6
280	Ophir....6⅜	100	Northern Belle....17⅞
390	Overman....1.80@1⅞	200	Pinal....2
435	Potosi....3.10@3.05	100	Syndicate....45c
1350	Savage....3.15@3.20	200	Scorpion....5c
1250	Sierra Nevada....14⅜@15⅛	60	Tiptop....5⅞
100	Scorpion....1.65	200	Wales....75c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Stormont (Utah), August 19th, $3,300; Northern Belle, 24th, $7,661; Bullion of Paradise, 23d, $1,425; Idaho, 23d, $13,450; Ontario, 22d, $10,975; Barbee & Walker, 23d, $2,069; Frisco, 23d, $15,000; Mammoth, 23d, $5,177; Germania, 23d, $4,840; Hanauer, 23d, $2,140; Wood River, 23d, $2,570; Stormont, 23d, $3,305; Ontario, 24th, $10,905; Barbee & Walker, 24th, $1,981; Germania, 24th, $2,050; Mayflower, 24th, $4,300; Ontario, 25th, $7,660; Frisco, 25th, $1,700; Hananer, 25th, $2,155; Germania, 25th, $1,540; Stormont, 25th, $2,216; Barbee & Walker, 26th, $1,647; Hanauer, 26th, $2,140; Germania, 26th, $1,350; Great Basin, 26th, $5,500: Frisco, 27th, $17,500; Bullionville, 27th, $2,358; Western, 27th, $17,267.

SHOULD hydraulic mining be stopped, many hundreds of people who are not directly connected with it, would find their business ceasing to be profitable, and would be compelled to seek their livelihood in other lands.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	21	50	Aug 2	Sept 6	Sept 26	W H Watson	302 Montgomery st
Allion Con Co	Nevada	8	40	Aug 1	Sept 5	Sept 26	D B Chisholm	327 Pine st
Addenda M Co	California	5	10	July 11	Aug 17	Sept 6	T H Dixon	238 Montgomery st
Bullion M Co	Nevada	20	60	July 21	Aug 25	Sept 15	J M Brazell	328 Montgomery st
Belmont M Co	Nevada	29	15	July 27	Aug 30	Sept 26	J W Pew	310 Pine st
Best & Belcher M Co	Nevada	21	50	July 12	Aug 16	Sept 7	W Willis	309 Montgomery st
Cholbar M Co	Nevada	6	50	Aug 23	Sept 20	Oct 21	W E Dean	309 Montgomery st
Con Amsdor	California	2	1 00	Aug 3	Sept 6	Sept 24	F B Latham	328 Montgomery st
Con Imperial	Nevada	16	10	Aug 22	Sept 27	Oct 18	W E Dean	309 Montgomery st
Cou Virginia M Co	Nevada	16	30	Aug 2	Sept 24	Oct 22	A W Havens	309 Montgomery st
Grand Prize M Co	Nevada	6	25	July 30	Sept 3	Sept 29	E M Hall	327 Pine st
Gould & Curry S M Co	Nevada	40	50	July 15	Aug 19	Sept 8	H K Butchrow	309 Montgomery st
Gila S M Co	Nevada	8	25	July 22	Aug 22	Sept 6	J T McGeoghegan	318 Pine st
Hale & Norcross S M Co	Nevada	70	50	July 12	Aug 16	Sept 7	J F Lightner	309 Montgomery st
Independence M Co	Nevada	8	15	Aug 25	Sept 26	Oct 17	E M Hall	327 Pine st
Juniata Con M Co	Nevada	5	04	Aug 18	Sept 19	Oct 8	C V Hubbard	310 Pine st
Kentuck M Co	Nevada	16	50	Aug 22	Sept 26	Oct 17	A C Stuart	234 Montgomery st
Meadow Valley M Co	Nevada	16	30	Aug 1	Sept 10	Oct 4	H DeLaguna	414 California st
Mariposa L & M Co	California	21	1 00	June 8	Aug 10	Sept 7	L Leavitt	309 Montgomery st
Mono M Co	California	13	50	Aug 6	Sept 12	Oct 3	W H Lent	309 Montgomery st
Mt Potosi M Co	Nevada	7	15	Aug 12	Sept 17	Oct 10	J H Sayre	330 Pine st
Northern King M Co	Arizona	6	25	July 8	Aug 13	Sept 5	E A Holmes	318 Pine st
Occidental Con Gravel M Co	California	3	06	Aug 22	Oct 3	Oct 28	W Y Smith	414 California st
Oneida M Co	California	15	3 00	July 21	Aug 29	Sept 20	H P Bush	431 California st
Overman M Co	Nevada	50	50	July 20	Aug 24	Sept 14	G T Edwards	414 California st
Potosi M Co	Nevada	6	50	Aug 29	Oct 4	Oct 25	W E Dean	309 Montgomery st
Seg Belcher M Co	Nevada	19	1 00	Aug 3	Sept 6	Sept 27	G D Edwards	414 California st
Silver Hill M Co	Nevada	10	25	Aug 16	Sept 19	Sept 10	W E Dean	309 Montgomery st
Tioga Con M Co	California	14	20	Aug 16	Sept 22	Oct 12	W H Lent	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M Co	California	3	15	Aug 22	Sept 22	Oct 10	J M Buffington	309 California st
Alpha Hydraulic M Co	California	3	25	Aug 20	Sept 27	Oct 18	J Ireland	216 Sansome st
Bengal M Co	Arizona	1	02	Aug 31	Oct 7	Oct 29	J H Sayre	330 Pine st
Black Hawk M Co	California	12	10	July 15	Aug 19	Sept 9	H A Charles	419 California st
Bellance G M Co	California	6	05	Aug 26	Sept 30	Oct 20	W H Lent	309 Montgomery st
Delano M Co	California	2	03	Aug 13	Sept 16	Oct 7	J Morizo	328 Montgomery st
East Noonday M Co	California	2	05	Aug 2	Sept 8	Sept 24	C V Huhhard	310 Pine st
Golden Fleece M Co	California	22	40 00	July 23	Sept 3	Sept 22	Fr Schirmcier	735 Folsom st
Harrington M Co	California	2	05	June 15	Sept 14	Oct 4	O O Muller	409 California st
Iowa M Co	Nevada	14	05	July 27	Sept 12	Oct 5	O S Leavitt	411 California st
Lodi M Co	Nevada	3	05	July 19	Aug 22	Sept 12	A B Paul	328 Montgomery st
Lodi M Co	California	3	05	July 19	Aug 22	Sept 12	A B Paul	328 Montgomery st
May Flower G M Co	California	12	10	July 19	Sept 7	Sept 28	J Morizo	328 Montgomery st
Morgan M Co	California	7	50	July 8	Aug 16	Sept 13	J Raphael	533 Kearny st
New Basel Con Gravel M Co	California	—	10	Aug 25	Oct 1	Oct 20	F X Simon	525 Commercial st
New York M Co	Nevada	26	10	July 16	Aug 18	Sept 8	D L Thomas	327 Pine st
North Gould & Curry M Co	Nevada	1	25	July 15	Aug 15	Sept 6	N C Southard	331 Montgomery st
North Gould & Curry G & S M Co	Nevada	1	25	July 5	Sept 15	Oct 12	M C Southard	331 Montgomery st
Navajo M Co	Nevada	8	25	Aug 19	Sept 22	Oct 13	J W Pew	310 Montgomery st
Oro M Co	California	9	25	Aug 16	Sept 21	Oct 12	W Stuart	320 Sansome st
Oakland M Co	California	16	05	July 30	Aug 31	Sept 19	R D Hopkins	436 Montgomery st
Realizing G M Co	California	1	044	Aug 31	Oct 3	Oct 21	R D Hopkins	317 Montgomery st
Santa Anita M Co	California	1	13	Aug 20	Sept 25	Oct 19	J B Titus	34 Kearny st
Sherwood M Co	Nevada	3	05	Aug 11	Sept 19	Sept 10	J M Buffington	309 California st
Sierra M Co	Nevada	69	1 00	July 15	Aug 18	Sept 6	E L Parker	309 Montgomery st
South Hite M Co	California	2	10	Sept 1	Oct 5	Oct 29	T A Berlin	515 California st
Spaulding G & S M Co	California	2	10	June 28	Sept 23	Oct 21	J W Pew	310 Pine st
University G M Co	California	9	10	Aug 15	Sept 20	Oct 12	Wm. L Oliver	323 Montgomery st
Western Home Con M Co	Idaho	2	05	Aug 16	Sept 26	Oct 26	A Halsey	328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Addenda M Co	California	T H Dixon	323 Mantgomery st	Aunnal	Sept 7
Arnold G & S M Co	——	A Judson	320 Sansome st	Annual	Sept 6
Booker Con M Co	California	W H Lent	309 Montgomery st	Annnal	Sept 26
Butte Ditch & M Co	California	W B Lake	8 Ellis st	Stockholders	Sept 5
Dudley M Co	——	C V D Hubbard	310 Pine st	Annual	Sept 13
Grand Prize M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 20
May-Belle Con M Co	California	W J Taylor	310 Pine st	Stockholders	Sept 12
Lodi M Co	Nevada	A B Paul	328 Montgomery st	Annual	Sept 10
Mint M Co	California	H H Haskell	523 California st	Annual	Sept 26
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	Annual	Sept 12
Norwich M Co	Nevada	J B Curtis	310 Pine st	Annual	Sept 6
Putnam M Co	Nevada	A K Hartwell	609 Folsom st	Annual	Sept 5
Queen Bee M Co	California	G W Fisher	324 Pine st	Annual	Sept 5
Real del Castijo M Co	Nevada	A Judson	320 Sansome st	Annual	Sept 6
San Pedro M Co	——	H Deas	309 Montgomery st	Annnal	Sept 5
Swamp Angel G M Co	California	Lewis Lillie	607 Washington st	Stockholders	Sept 15
Tellurium G & S M Co	——	J M Litchfield	413 Montgomery st	Annual	Sept 29
Tuscarora M & M Co	Nevada	M E Sperling	309 California st	Annual	Sept 14
Villa Grana M Co	Mexico	A Judson	320 Sansome st	Annual	Sept 6

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Aug 27
Father De Smet M Co	Dakota	H Dean	New York	50	June 10
Northern Belle M & M Co	Oal	Wm Willis	309 Montgomery st	50	Aug 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Aug 15
Silver King M Co	Arizona	J Nash	315 California st	25	Aug 15
Standard Con M Co	California	W H Lent	309 Montgomery st	75	Aug 12
Tip Top M Co	Arizona	H Deas	309 Montgomery st	20	Aug 25
Western M Co	California	C S Curtiss	309 Montgomery st	75	May 12

The Mining Share Market.

The market for mining shares is not particularly active just now, nor has it been for some little time. Up on the Comstock the situation is unchanged. The *Enterprise* says: Although no points have been reached in regard to which much can be said, yet work is making good progress in the lower levels of all the leading mines. This work must soon be productive of results that will claim special attention and cause a demand for stocks at points where new ground is being opened and explored. The indications at the north end are that the water will soon be drained off sufficiently to allow of the resumption of drifting on the 2700 level of the Union Consolidated. The pressure is now so small that the water is allowed to flow ont at its own gait from the drill holes in the east drift from the Union shaft, the pumps easily handling all that comes to them. In the middle mines they will soon be able to resume prospecting operations on the 2400 level without fear of water. The main south drift through the Chollar and Potosi ground will be cleaned out and repaired next week, when the next work in order will be crosscutting. At the Savage they will also be able to act on the aggressive next week. The hydraulic pump continues to work well, even when run up to 13 strokes per minute, and no reason can now be seen why it should not continue to so run, barring accidents liable to occur to any kind of machinery when in motion.

Although rumors current on the street, the Virginia *Chronicle* said: It was reported that the drills on the 2700 level of the Sierra Nevada had run into ore. Mr. Patton told a *Chronicle* reporter to-day that no developments had been made in the mine, and that he would be only too happy to show up ore if the same could be found. He added that he had still faith in the north end, and that if there were ore in any of the mines under his direction, he proposed to find it and let the people see it without delay. He positively assured the reporter that there would be no hiding developments, and that there had been none.

A New Safety Clutch.

The Palmer safety clutch for elevators—the latest device for preventing accidents on elevators—has attracted a great deal of attention at the fair, where the inventor has an elevator in operation with the new clutch attached. The clutch is placed under the platform of the elevator on timbers especially arranged for it. In fact, the clutches proper are attached to a skeleton platform under the main one, but independent of it. This is balanced by a weight, the rope of which goes over the same pulley as that which raises and lowers the elevator. Therefore, the platform carrying the clutch will rise and fall with the elevator, and yet be independent of it. If now the rope carrying the elevator should break and the elevator drop, it will only drop an inch or two, and will then strike the dogs of the clutch, these holding the lower platform and preventing further descent. This action is instantaneous and positive, no spring weights or anything being required. The cage is caught before any momentum is given it. The platform underneath supports all the weight, instead of suspending it. The greater the weight on the elevator, the quicker the catch and lighter the fall. The dogs jam towards each other, one pair on each side, and do not, therefore, tend to spread the guides, as most clutches do. The cage is caught instantly. We shall shortly illustrate this new device, which is the simplest form of clutch made.

THE Helena (Montana) *Independent* reports the sale of the famous Broadway mine, with its associate, the Mntual Agreement, to English capitalists, together with the mill connected with the mine, for $225,000. One hundred and twenty-five thousand is deposited with the Kountze Bros., of New York, and another $100,000 is to be paid within six months.

CERRO GORDO, the old stand-by mining camp of Utah, is on the turn for happier days. There are three companies at work there now.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

BUDDLES.—Amador *Ledger*, Aug. 27: Buddles have been put in the Zeilo mill, for the purpose of saving the sulphurets which escape the Fruo concentrators. P. Cramer, an experienced man with buddles, is in charge of them at present.

VOLCANO ITEMS.—There is scarcely anything going on in mining matters around Volcano, owing to the scarcity of water. The water supply has been unusually scant this season. It requires all the water in the Volcano ditch for the cleaning-up operations at the Grass Valley gravel claim. At the Grass Valley hydraulic claim a strong force of men are employed cleaning up. A satisfactory yield is expected. The Downs mine is idle, as far as the extraction of rock is concerned. The mill has closed down for want of water. The ore dump has plenty of rock on hand. The shaft is being thoroughly repaired and retimbered. Nothing is doing at the Volcano tunnel. A contractor was on the ground lately, sent up by the company to estimate the cost of so controlling the water of the south branch of Sutter creek as to prevent it flowing through the tunnel. It is feared that if both streams are permitted to flow through the tunnel, it will be seriously damaged, if not ruined, in flood time. Hence the idea of diverting the south branch.

BUTTE.

GOOD PAN.—*Mercury*, Aug. 26: A pan of dirt taken from a mine at Centerville, in this county, the other day, yielded $21.

BIG BEND.—Mr. Waldemar Allstrom, of the Monte Cristo mine, arrived in this city Sunday evening. He is managing the Big Bend property, and stated that work would be commenced on the roads leading to Big Bend this fall. He also stated most positively that the tunnel would be in full operation at the beginning of next year.

RIVER BED.—It has been a well-known fact for years that the river bed from the head of the Cape claim down below Hamilton Bend is very rich. This is also known to the Chinamen, who, when summer sets in and the river runs low, go out on the points of the bars running into the river and mine there with rockers, getting all the way from 10 to 15 cents to the pan. There is one point about a quarter of a mile from the lava beds that has prospected unexceptionally rich. The river runs over a bar composed of gravel and heavy rocks, and in summer it afforded a good crossing for stock. A number of years ago a small wing-dam was built in the river, and although the men were only able to work a few days, they took out $1,500 to the man. Since then several attempts have been made to wing-dam it, but have been unsuccessful. About two years ago, Henry Bird and T. W. Reece concluded that they would make an attempt to work the ground, but did not complete all their arrangements until this summer. On the 1st instant, they commenced the work. There was considerable water running in the river, and the current ran close to the south shore, so that it made it very difficult work. They made large boxes of heavy lumber and commenced sinking them from the shore filling them with sand. Both Mr. Bird and Mr. Reece worked a large portion of the time in water up to their waists, but they finally completed the dam, which forms a curve running out from the bank to a point beyond the middle of the river and joins on to a long bar coming out from this side. The entire length of the dam is 600 ft. The water is now being pumped out of the claim, the motive power being a wheel 16 ft long and 10 ft in diameter. On the end of the wheel is a six-foot drum which carries a belt to a three-foot drum, and this carries a belt to the drum that the pump travels. A large flume 160 ft long is being put in position, and as soon as the water in the dam is pumped out, a gang of Chinamen will shovel the gravel into the boxes. The ground prospects very rich, and Chinamen seeing the head of the bar which projects into the dam, gradually appearing, would go into the claim moonlight nights and rock until morning. But this was finally stopped. There is no doubt but that the gentlemen will make a very handsome thing out of it, for the ground has never been worked to any extent.

RICH DIRT.—*Butte Record*, Aug. 27: Some of the Centerville mines are still yielding well. One pan of dirt produced $21 the other day. It was taken from a ravine that has yielded as high as $53 to the pan. The Butte creek country will prove a bonanza yet.

CALAVERAS.

CLEAN-UP.—*Calaveras Chronicle*, Aug. 21: A partial clean-up has been made in the McCann & Rigney gravel mine on Tunnel Ridge. The gravel paid well, in fact better than the proprietors expected. Work is progressing actively in the mine, and pay gravel is being taken out. Owing to the scarcity of water in the ditch it will be quite a while before a thorough clean-up can be made, but when that time arrives the yield will astonish some of the croakers who are continually harping about "old played out Calaveras."

WORK TO BE RESUMED.—Active operations are soon to be commenced on the well-known Hoosier and Horsethief quartz mines, situated in the Jesus Maria district. The mines have been idle for quite awhile owing to the litigation. The mines have been well developed by the present proprietors. A shaft has been sunk on the lead to the depth of 140 ft, and levels run north and south over 60 ft, uncovering a splendid body of quartz. A tunnel has also been run on the lead for a distance of 250 ft, the rock averaging $12 per ton the entire distance, the lead showing over four ft in width. The proprietors—Messrs. Boyle, Harper and Farr—took out over $16,000 from the mine while running the tunnel and sinking the shaft for the purpose of developing it, working unassorted rock with an arastra. There are now some 8,000 tons of rock in sight, some of it being high-grade ore, but all of which would yield remarkably well if put under the stamps. The natural facilities for a mill are good, the proprietors having a free water right, taking the water from Jesus Maria creek in two large ditches.

EL DORADO.

THE ARCTIC QUARTZ MILL.—*Mountain Democrat*, Aug. 27: John M. McLaughlin came down from Grizzly Flat last Thursday, and reports that Dan Wickham had just completed the new 10-stamp mill at the Arctic mine, and when McLaughlin left they were just about to slip on the belt and set the machinery in motion.

GOPHER-BOWLDER.—Lively work is being done at the Gopher and Bowlder mines. The new 20-stamp mill is being kept in constant operation on ore from the main Bowlder tunnel, and is crushing from 20 to 25 tons per day. The ore is of the same character as the experimental 500 and odd tons from the same locality that was some time ago crushed at the Chaparral mill, and the appearance of the plates indicates that the returns in this will be fully as favorable as in the former case, which will be highly satisfactory, as the transportation of the ore cost $1.50 a ton in that case, which will be saved now and added to the profits. A clean-up will be made about the 15th or 18th of Sept.

TWENTY-STAMP MILL CONTRACTED FOR.—Messrs. Solkedt & Eckhardt have closed a contract for the immediate erection of a 20-stamp quartz mill at the Mount Pleasant mine, Grizzly Flat. They commenced work last Monday, and are increasing their working force as opportunity offers. They expect to have the mill running within six weeks.

THE CHAPPARAL MINE.—Work has been resumed at the Chapparal mine on the ore body that was opened up from the shaft last spring, and from which they were driven out by the water at that time, but which is now drained and in good workable condition. It is calculated that within two or three weeks enough ore will have been taken out to justify starting up the mill again. In the

meantime the tunnel is being driven from Kelsey canyon toward the shaft. This tunnel is 300 to 400 ft lower than the present workings at the bottom of the shaft, and henceforward no interruptions on account of water are apprehended.

SALE OF A MINE.—A Mr. Lyon has purchased of Messrs. Orcutt, Pierce and Buckingham their recent quartz discovery near Pleasant valley. The purchase price is said to have been $22,500; $5,000 down, and the balance in deferred payments. It is reported that he will immediately commence active operations on his new purchase. May success reward his enterprise.

EUREKA.—Georgetown *Gazette*, Aug. 26: The body of ore just opened up on the lower level of the Eureka, prospects well in free gold across the entire ledge, a distance of 40 ft. A large force is now engaged in drifting north on this immense face of ore. The Eureka is most assuredly a success.

A fine specimen nugget and some smaller pieces, amounting to $565, was found by George Sharon on Tuesday, the 15 instant, in his mine on the Greenwood seam belt, west side American canyon.

MINING ENTERPRISE.—*Mountain Democrat*, Aug. 27: Mr. O. H. Spencer was in town this week, awaiting the arrival of a 60-horse-power holler and engine, which he has recently purchased and is having transported to the Morey Co's. claim—the old Grouse gulch mine—near Grizzly Flat. This mine was opened many years ago, and worked with flattering prospects by a company in which E. R. Morey, of Grizzly Flat, and Hon. Geo. O. Blanchard, of this city, were members, by whom it was transferred to a company in which Mr. Spencer is the principal stockholder. The heavy machinery above referred to is being forwarded for the purpose of erecting substantial hoisting works, with the intention of sinking the shaft, which is now down 100 ft. 500 to 1,000 ft deeper. The ledge, which was about 20 to 24 inches wide at the surface, has gradually widened until now, at the bottom of the shaft, it is over 5 ft. Mr. Spencer has determined to open and work this mine on strict business principles, for what there is in it, and not for speculative purposes, and will superintend its working in person. This fall he expects to put up a 10-stamp mill, for which the engine and boiler now on the way will furnish abundant power, as well as for the pump and hoisting works.

MARIPOSA.

BREEN QUARTZ MINE.—*Gazette*, Aug. 27: This mine, which lies contiguous to the Diltz, like many others in the same vicinity, has acquired no great amount of notoriety, although labor has been done sufficient to satisfy anyone that this vein of auriferous ore possesses inducements for development. We have now before us some specimens of the ore taken direct from this vein by Colonel Swadley and others, who visited the mine on Monday last. It required no magnifying glass to observe the jettings of free gold cropping out in pyramidical forms from the solid quartz. The extent of the richness of this body of ore is of course unknown, but sufficient has been exposed to give assurance of its permanency. Negotiations have been made with the owners for the mine by Colonel Swadley, and will form an important adjunct to the Diltz mining property, which has also been bonded to Colonel Swadley, who represents an Eastern syndicate formed for mining purposes.

NEVADA.

NEW PUMPS.—*Transcript*, Aug. 25: The eight-inch pump in the Nevada City mine, which has recently been found incapable of handling the water, is to be replaced next week by a ten-inch plunger.

PEABODY.—The company sinking on the Peabody mine at Grass Valley for an interest therein had nearly finished their contract when the water began to come in so fast, that the pump could not handle it. Sinking has been temporarily suspended in order that a larger and more powerful wheel can be substituted for the one heretofore in use.

MOUNTAINEER.—The Mountaineer mining company, operating on Deer creek above the Merrifield, finding that the supply of water from the Excelsior ditch is not regular enough during the dry season, are connecting with Snow Mountain ditch on the other side of the creek. The new arrangement requires that 1,200 ft of pipe be laid. In the meantime the mill, which depends upon water for motive power, is idle.

LUDDINGTON.—W. T., S. M., Thomas and John Shurtleff, all of this city, who, with Geo. Flint, have for 1½ years been developing the Luddington ground, which is the second claim below the Godfrey drift mine at Alta Hill, are of late meeting with very favorable indications. Altogether they have run about 2,000 ft of tunnel, being misled until recently by a bar in the channel. For a week past they have been passing along the northeast rim of what is evidently the main lead, and the gravel encountered shows considerable gold. Their bond on the ground has 1½ years to run, and before that time has elapsed they hope to have opened up a first-class drift mine. The Godfrey, which was for a long time under very discouraging conditions, is said to now be paying largely.

ROBERT CRYER has been appointed superintendent of the Peabody mine at Grass Valley.

MINE SOLD.—*Foothill Tidings*, Aug. 27: The Buckeye mine, situated between Sweetland and Birchville, has been sold to Sweetland men. This mine was originally purchased by an English company from Oen. O. Evans, John S. Stidger, Thomas Clarke, Dan. Rourke, P. Purcell and John Taylor. These gentlemen sold out to an English company in 1870 for something over $200,000. After working this claim for some years and realizing an enormous profit therefrom, Geo. D. McLean, then the superintendent of the mine, and Mr. Geo. E. Yates, purchased it from the English company. The mine was successfully worked for a number of years by McLean and Yates, and was recently sold by them to Messrs. Rourke (one of the original owners), James O'Farrell, Martin Burt, and others, for the small sum of $6,000. Mr. Rourke is now back in the old business of extracting the lucre from the shining sands. We understand the mine will be worked by drift process.

A CORRESPONDENT writing from North Bloomfield gives us some items of interest from that region: Things are kind of dull here lately, but are picking up considerably just now. The Derbec mine is improving at the present, and the management is putting on an additional force of men. The gravel in the mine is looking well. The new shaft, having had many set-backs, has progressed slowly, but is now doing better. Sushay's quartz mill is grinding away on ore night and day.

PLUMAS.

ELIZABETHTOWN.—Plumas *National*, Aug. 23: Corbin & Manson have commenced moving the machinery from the Meylert & Hughes shaft to their new shaft at the lower end of the Loring & Leavitt claim. This shaft is down 40 ft, and will have to go 40 ft more to get bottom. They intend to put on heavy machinery at the lower end of the O'Neill ranch, and work the whole flat from a shaft at that point. Mr. Manson tells us that a man has been employed for some time in going over the bedrock which paid so richly in the Loring & Leavitt, and his average pay has been $35 per day. They will push the work rapidly in these claims, and employ all the men they can make profitable.

MORE "BIG SLUGS."—The Western gravel claims, at Newtown Flat, owned by Bell Bros. & Co., are attracting considerable notice just at present, for the reason that they are turning out some huge pay in the shape of heavy lead gold, with indications that the strike is a permanent one. For the past 8 weeks, with one man taking out pay dirt, the result has been $1,050. We were shown the gold, and it has the regular old-fashioned appearance, indicating that the owners are on the right track. Among the nuggets were pieces weighing $65, $55, $51, $45, $26, and numerous smaller pieces running from $1 to $10. The clean-up for Tuesday was $120. Water is very scarce at the present time, and it is difficult to get enough to wash up what little pay grit is being taken out, but the owners intend to have the mine thoroughly open by the time that water comes, and with a full force of miners will make business lively. The Western claim was worked some 20 years ago, and the ground easily reached was panned out, since which time it has been idle. Lewis Bell has always kept possession of the claims, however, with the idea that they would prove valuable, and the present work is certainly proving that his judgment was sound.

INDIAN VALLEY MINE.—Greenville *Bulletin*, Aug. 20: New hoisting and pumping machinery is to be put up at the Blood shaft. The framing is now ready and will be raised to-day. This shaft is 700 ft deep, going 300 ft deeper than the tunnel leading to the mill. As soon as the pumps are ready the bottom part of the shaft will be pumped out and work resumed upon the lower level; this will not be much of a job, as the amount of water in the mine is but little. From the top of the shaft a way is graded to the upper tunnels; from these the ore will be run out and dumped down the shaft 400 ft, to the inner end of the tunnel. The space left by the old stopes gives room for chutes at which the cars will be loaded for the mill. The upper tunnels are being cleaned out and timbered so that ore can be taken from them as wanted. In the old condition of the mine no system could be discerned; now there is a comprehensive plan, connecting all these tunnels and the shaft in one design. The arrangement is so good that all ore containing over $2 per ton in gold can be worked at a profit.

GRANITE BASIN.—From a correspondent we learn the following: The 20-stamp mill for the Morning Star and Trenton mines has been coming for the past week, and with teams hauling lumber for the building, give activity and bustle in camp. The mill is to be placed in the canyon below the mines. The grading of the road leading to it, which has been in progress for the past 2 months or more, is now finished. The work was found very heavy by the presence of hard rock not expected. The same trouble is met in grading for the mill, and it may take another 2 weeks getting ready to erect the machinery.

TRINITY.

GOOD PROSPECTS.—*Journal*, Aug. 27: Capt. O. H. Atkins informs us that he recently visited the East Fork and found that Harrington & Montgomery were about opening a new mine in a high bar on that stream, which prospects quite well. Capt. Atkins showed us some gold which he panned out, and which is regarded as a fair drift prospect. With a good hydraulic rig on the ground, it is thought the claim will pay splendidly.

FIFTEEN UP.—Miners here and elsewhere in this county are busily engaged in getting their claims ready for next winter's work. Of course it will be a wet season.

YUBA.

QUARTZ MINING AT TIMBUCTOO.—*Foothill Tidings*, Aug. 27: Last Monday the builders completed a new quartz mill at Timbuctoo, in Yuba county. The mill will be used for the reduction of ore from the Marc Antony mine. The mill and mine are owned by Mr. M. T. Brewer, of Sacramento, and Mr. R. G. Hart, of Grass Valley. The ledge of the Marc Antony averages about 4 ft in thickness, and shows well. It is heavily charged with gold bearing sulphurets. The rock runs from $8 to $10 per ton by mill process, which yield fully justifies the owners in erecting the mill. At the mine there is a shaft down 105 ft, and a tunnel is in 100 ft to the ledge; then following on the ledge about 200 ft. This makes the inner end of the tunnel about 130 ft from the surface of the ground. The ledge has constantly improved from the surface to the depth to which it has been worked. On the dump there are about 300 tons of ore, and the mill is now crushing that as rapidly as possible. The mill is a 10-stamper and is run by a 40-ft overshot wheel, with a 5-ft breast. Fourteen men are at present employed about the mill and mine. Mr. Hart will superintend the working of the mine and mill. He says that the prospects are very flattering, so much so that he and Mr. Brewer purchased the entire property. Water for all purposes at the mill is obtained from the Excelsior Water Co.

NEVADA.

WASHOE DISTRICT.

CON. VIRGINIA.—*Enterprise*, Aug. 28: The joint Best & Belcher crosscut on the 2500 level has been extended 25 ft. The joint California winze, on the same level, has been sunk and timbered 8 ft, and have commenced setting the hoisting engine.

OPHIR.—The joint Mexican east drift from the 2900 station of the joint winze has been extended 20 ft.

MEXICAN.—At the joint Union Con. east winze the tank station at the 2600 level has been completed—the tank placed in position and the winze sunk and timbered 8 ft.

CALIFORNIA.—During the week 69 tons and 600 lbs of ore have been extracted from the 2000 level.

SIERRA NEVADA.—The tank pit at the 2700 station in the joint Union Con. east winze has been completed and the tank placed in position.

UNION CON.—The tank pit at the 2700 station of the joint Sierra Nevada east winze has been completed, and the tank placed in position. The tank pit at the 2600 station of the joint Mexican winze has been completed—the tank placed in position and the winze sunk and timbered 8 ft.

KENTUCK.—On 240 level have breasted out 2 square sets, put in 5 sets on track floor, and 4 sets on second floor. Are compelled to work some poor ground. During the week have assorted and sent to the mill 10 tons of low-grade ore per day. Usual work on top.

YELLOW JACKET.—The north lateral drift on the 3000 level has been run 30 ft during the past week, making the present length of the same 100 ft from the switch. The ground continues very hard and dry.

NEW WELLS-FARGO.—Are now starting a south lateral drift east of the vein on the 500 level. When this drift has reached a sufficient distance south, a crosscut will be run to the west across the vein. The face of the main west drift is still in good looking vein matter, and giving low assays.

ALTA.—Are cutting out for pump station at 2150 level. About 4 or 5 days more will finish it, when the pumps will be placed there.

CRABB DISTRICT.

FLATTERING.—Esmeralda *Herald*, Aug. 26: A meeting of the miners of Crabb Mining district was held August 13th at S. Y. Crabb's camp. Local laws governing the district were adopted, and except that locators are allowed 300 ft on each side of the lode line, the laws do not differ in the main from those of Esmeralda district. A. Davidson was elected Recorder for the term of one year. The reports from the district are very flattering, and the prospects for a live camp there in the near future are good. A quantity of rock was brought to Aurora and "horned," showing exceedingly rich in coarse gold, going high up in the hundreds of dollars per ton. The rock is quite soft, and would pay big even in an arastra. The ledges that have been opened to any extent show well defined foot and hanging walls, and vary from 2 to 10 ft in width. Work is being done on several of the claims. There have been 20 locations made already, and the number will no doubt be doubled in a short time, as the district is receiving considerable attention. The mines are not more than 2 miles in a direct line from the East Walker river, which affords the finest chance in the world for running an unlimited number of stamps with water power. We are assured that ore could be mined and milled at an expense not exceeding $5 per ton.

ESMERALDA DISTRICT.

PROGRESS.—Esmeralda *Herald*, Aug. 26: The prospects of Esmeralda mining district are certainly brightening up a little, and there is a better feeling existing at present toward our mines than for many months previous. A number of transfers of valuable mining properties have been made of late. There is, beyond a doubt, the finest opening for capital, right here, of any mining region on the Pacific coast. There are millions of tons of ore in sight, and even lying on the dumps made here in early days, that will pay a reasonable profit for milling, while there is now uncovered in the Cortez, Centennial Humboldt West, Silver Lining, New Esmeralda and other mines, ore that would pay handsome dividends if we had milling facilities.

THE CORTEZ.—We are pleased to see that, on the 22d inst., the Cortez mining company purchased, for $1,000, the Bonanza tunnel, formerly owned by Silas B. Smith. The purchase includes both the Smith and Goodrich title. This tunnel extends from Willow gulch into Silver hill 602 ft. The work in this tunnel will be pushed forward at an early day, until it reaches the Cortez ledge, which it is thought it will do in running about 150 ft. When this shall have been done it will afford a splendid and economical means of ingress and egress to and from the lowest point now attained in the mine, giving excellent drainage, thorough ventilation and means of supply, and greatly reduce the expense of hauling lumber, etc., to the mine. The ore body struck on the southwest drift, on the level with the tunnel now in use, is looking well, and is enlarging. Exceedingly high assays could be obtained from this body, which was reached only one week since.

THE HUMBOLDT WEST.—Work has been confined to the south drift, which has been driven several ft during the week. The same good quality of ore has been encountered in the drift that was found in crosscutting the ledge on the same level—thus 100. This immense ore body can be easily mined, and at a trifling cost put into a mill at the base of Humboldt hill, on which the mine is located.

THE CENTENNIAL.—Work in this mine is progressing very satisfactorily. The rock in the bottom of the incline is looking better than at any other point, and a superior grade of ore is being extracted.

SAFFORD DISTRICT.

VERY POOR ORE.—Eureka *Sentinel*, Aug. 26: We had high hopes of the new district near Pallsade. We wished the new mines to prove a grand success. They are splendidly located near the Humboldt river and the railroad, and the great mass of high-grade ore reported in sight caused us to hope and believe that a second magnificent mining locality had been discovered within the limits of Eureka county. We now fear that all of these bright anticipations are to be doomed to disappointment. We have known for 3 days that assays made here were not satisfactory, but we thought best to await developments and further proofs. We hesitated to condemn without first being doubly assured of the correctness of our position. There seems now little room for doubt. The outlook of the new discovery is not as bright as it was. The assays have not held up. A dozen or more samples brought hither within the last few days have failed to show any value worth recording. Indeed, many pieces have not shown as much as a trace of either of the precious metals. The evidence is overwhelming that the great mass of the rock is comparatively valueless. Under this state of affairs it becomes the duty of the *Sentinel* to make public the facts. There is evidently a very rich streak in the Onondaga mine, but the great mass of the ledge matter does not pan out. Possibly this rich streak may lead to something good, but that remains to be demonstrated. Capt. Foster and others have brought up average samples, which, on being assayed, were found to contain next to nothing. There is a chance for the heavy mass of black iron to give way to the yellow carbonate ore at depth, and this we hope may be the result, but until it does, the principal mine cannot yield in paying quantities. The finding of any high-grade ore at all is of course an encouraging feature, and one worth following up.

WALKER DISTRICT.

PROSPECTING LIVELY.—Eureka *Sentinel*, Aug. 23: A gentleman who arrived on the Comstock last week from the Walker river country says prospecting is very lively out that way. Copper ores are being looked after quite as assiduously as are those of the more precious metals, as it has now been demonstrated that they can be made to pay well, even when shipped to Dayton. Much good copper ore is found on and near the surface. Some very promising mines, containing gold and silver, are being opened, and the owners of some of these are already shipping ore to the reduction works at Dayton.

ARIZONA.

BORVIA COPPER MINING CO.—Globe *Chronicle*, Aug. 25: Noticing in the New York papers the organization of another copper mining company bearing the above title, a representative of the *Chronicle* visited the property a day or two since and found that it consisted of 4 copper locations—Borvia, Cuban, Sunrise and Sunset. Each of these are full claims of 1,500 by 600 ft, situated on Cactus hill, some 3 miles from Globe and within half a mile of the Old Dominion mines.

MACK MORRIS.—The ore shutes are full to overflowing, and Mr. West, the foreman, has been compelled to stack ore in the head of drifts on the 3d level in order to give room for working. It is estimated that fully 250 tons of ore is in this manner piled away in the mine ready to bring to the surface.

EMBLINE.—This property keeps up its excellent showing of high-grade ore, which is down 91 ft. The dump contains about 200 tons. It has been found necessary to procure air pipes for the winze before any further sinking is done.

MINERAL HILL DISTRICT.—*Enterprise*, Aug. 26: The Never-Give-Up, Hard Cash, Rough and Ready, and the Baby are located about 4½ miles due north of the Gila river and ¾ of a mile from the wagon road now building from the Silver Belle quartz mine to the river. The owners propose to commence work on them as soon as the rainy season passes, and will show them up in good style before they cease operations.

COLORADO.

SALE OF THE HIDDEN TREASURE.—Breckinridge *Journal*, Aug. 26: The great excitement in Summit county mining circles during the last week was the sale of the Hidden Treasure mining property—the extension of the St. Johns property near Montezuma—for $40,000.

NEW MACHINERY OF THE R. E. LEE.—Leadville *Herald*, Aug. 26: The new plant of machinery being put up by the Robt. E. Lee company is of importance to the mining interest of Leadville, however far more than the results directly to be derived from the mine itself. The drainage furnished by this pump and machinery will enable scores of properties beyond to resume operations, which have for months past been unable to continue work. The Little Silver, American, Tip-Top, Bang Kok, Enterprise mining company and dozens of others will be directly benefited.

BONANZA.—Cor. Denver *Tribune*, Aug. 27: Our mining district, though but a little over one year old, has located within its boundaries over 5,000 claims. The strikes of the past season pale away into nothingness in comparison with those of the present. Each day's development goes to show that our camp will at no very distant day rank with Colorado's chief and world-famed ore producers. Many men are making fortunes here by developing their prospects, and provlug them to be mines of no inferior quality. Capital is drifting in from all quarters. Each day we hear of new sales being consummated.

DAKOTA.

OOON CLEAN-UP.—Black Hills *Times*, Aug. 27: The Gustin mill, in Blacktail, cleaned up on Saturday—a semi-monthly clean up. The retort is a good one, weighing 640 ounces, and valued at something over $11,000. The Gustin mine and mills are owned by Nimrod Lancaster & Co., and have operated since the fall of 1877. The mine is a deposit or blanket formation, and is without exception the best one ever discovered in the Hills. There has been no petering of the ore body, but on the contrary it has increased in quantity and quality since the first pick was stuck into it until to day. There is now enough ore in sight to warrant the erection of a 60-stamp mill in addition to the 45 now running.

CARBONATE NOTES.—The new camp is progressing favorably, a large amount of work being done, and more doing, although there is not that rustling spirit manifested by all the first locators we should like to see. Quite a number of them are at work all the time, noticeably among whom are the Jefferson, Adelphia, Richmond, Frank Norton and Frank Bryant companies, Watson, Dolloff and crowd, Craig, Ellis and outfit, Pat O'Brien and a few others, and to offset these there are a great many who develop their claims just as a local editor fights, very cautiously.

IDAHO.

WOOD RIVER ORE.—Wood River *Times*, Aug. 24: During the months of June and July over 2,000,000 lbs of ore, averaging $200 per ton, were shipped from the Wood River mines. This is exclusive of the bullion, of which there were only 4 carloads shipped, the only smelter on the river not having got fairly started. The smelter now produces a carload of 10 tons of good grade bullion every 48 hours.

THE FIRST STEAM WHISTLE IN BULLION.—The Bullion hoisting works were started up last Sunday, and the whistle "tooted" for the first time.

ORE AND BULLION SHIPMENTS.—From Bullion, during the 2 weeks ending to-day, 863 sacks of Bullion ore and 818 sacks of Mayflower ore were shipped. From Hailey, during the week ending this morning, Cliff & McKay shipped to Kelton 500 sacks of Wood River and 335 sacks of Mayflower ore. C. B. Fox shipped last week 65 sacks of Idaho ore. About 25 tons more were shipped direct from the mine. The sacks average 130 lbs. From the smelter, during the week ending yesterday, the Wood River smelting company shipped 160 tons of base bullion and high-grade ore. The ore was shipped because more was offered for sale than the smelter could work. The utmost capacity of the furnace is 20 tons per day.

THE SMELTER AT KETCHUM.—The foundations for the sampling, smelting and separating works at Ketchum are up, the turbine wheel is set, and the work is being pushed actively. They are expected to be ready to start up by the 1st of October at latest.

WOOD RIVER NOTES.—*Times*, Aug. 24: Times have been very dull on Wood River during the past 30 days, and the dullness has been felt to a greater extent because of the exceeding liveliness of all branches of business during the preceding 90 days, when the rush of new-comers was at its height. Several causes will contribute to the gradual improvement. The mines are opening up splendidly, and men of means are coming in on every stage to look for bargains. Again, the various reduction works will soon begin to buy and work ores. At Sawtooth a 20-stamp mill is being erected, and 10 stamps, with a daily capacity of at least 20 tons per day, will be ready to start by the 1st of October. The other 10 will follow soon after.

MONTANA.

BULLION SHIPMENTS.—Butte *Miner*, Aug. 23: The shipments of silver bullion bars by the Pacific Express Co. through their office in Butte for the week ending Saturday, August 21st, footed up 4,717 lbs, valued at $6,372. This weekly shipment, if kept up, would aggregate $4,118,254 for the year.

MOULTON.—The Moulton mine still maintains its steady development. The main 3-compartment shaft had reached a depth yesterday of 464 ft. Exceedingly rich ore is coming out of the Moulton. In drifts No 7 and 8 one of the finest bodies of ore that has been uncovered in this district has been found. These samples gave the following results: $990 07, $1,014 04 and $1,304 52 to the ton of ore. This rich developing looks as though the Moulton will rank as the bonanza of the camp. Crosscutting at the 400 level is pushed, both north and south, with great vigor. The north cut is run to tap the north vein, which at 300 ft deep is proven to be rich, and the south cut is running for the vein, which at the 300 level is producing $1,000 ore.

BELLE OF BUTTE.—The Belle of Butte mine is looking first-rate. The drifts now being driven on the ore vein, both to the east and west, are developing a large vein of first-class ore. From these levels and the stopes in the levels nearly 30 tons of ore are extracted daily. The character of the ore is for the most part free milling.

LEXINGTON.—The new company has taken possession of the mine, and the operations will be conducted hereafter under the new management. It will take some little time to complete station-cutting work at the 200 level after which the main shaft will be sunk deeper. A new Knowles' double-plunge pump has arrived. At the old incline shaft a winze is going down, and it has reached a depth of about 70 ft below the old level. The ore raised from the winze is partially free-milling, but is growing of a baser character as the winze attains depth. The company will, for the present, run the Lexington 10-stamp mill on tailings, and will clean up the ore on dump piles for milling. The construction of the Lexington 40-stamp mill will be commenced immediately. The old 10-stamp mill is, we understand, to be remodeled to some extent and turned into a tailings mill.

ALICE.—Of the Alice mine there is nothing unusual to report. The mine is showing up well in all its workings. In all the openings of the mine the appearances of the ore-bodies are flattering. Daily ore is taken from all the levels, from the 100 down to the 700 level. The quantity extracted per diem remains at the old standard, which may be reported as averaging 75 tons per diem. Both mills are running regularly and smoothly. The Bruckner furnace has arrived, and will be set up immediately.

MAGNA CHARTA.—The sinking of the main shaft at the Magna Charta mine to a greater depth than 300 ft has not commenced yet. Yesterday a good quality of ore was being raised from the levels and stopes of the mine. From the long tunnel there is considerable high-grade ore coming out daily.

NEW MEXICO.

IVANHOE.—*New Mexican Mining News*, Aug. 22: The owners or managers of the Ivanhoe mine in the Black Range are very particular about letting people go into the mine, and very few persons can gain admittance. This is because there is an inconvenient habit on the part of the people of slipping pieces of ore into their pockets, and the amount that would be carried off in that way during a month would be worth some thousands of dollars. Ore with free gold projecting from all sides is worth something a pound, and it is not very pleasant to have much of it lugged off in the pockets of one's visitors. A number of persons have been turned away from the mine and made very angry thereby. The managers are inexorable, however, and enforce the rule.

THE BLACK RANGE miners are confining their labors to a close proximity to the camps of the range. Since the Indians have appeared in such force in that part of the Territory they do not venture out in the mountains very far unless in considerable numbers and well armed. Even under these conditions it is not worth while to go out, as the men cannot work and be perpetually on the look out for Apaches, and ready for an attack. Consequently they keep near home and are waiting for the excitement to blow over. They believe the Indians will soon leave the country as the troops and citizens are making it uncomfortable for them down there now, and they will be likely to seek a safe and more retired section.

OREGON.

CLEANING UP.—*Democratic Times*, Aug. 26: The Sterling company has several men engaged in cleaning up, whose labors will end before many days. The results of the season's run, although not apparent, are known to be very good. Wimer & Simmons, of Josephine county, have finished cleaning up. We learn that they took out 100 ounces of gold the last day, and that their mine yielded about $30,000 during the past season. Jas. and A. C. Manning on upper Grave creek are preparing to work with M. W. Hale the coming winter. Zach. Cameron informs us that most of the miners on Applegate are getting ready for winter. We learn that negotiations are pending for the transfer of Yaudes, Saltmarsh & Co's. extensive mines on Sterling creek, to Ankeny & Co.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

WHITE CHIEF G. M. CO.—Aug. 31. Location, Arizona. Capital stock, $10,000,000. Directors—S. Belden, J. A. Crabtree, J. Fleming, T. Fowler and G. Shultz.

BLUE MOUNTAIN G. M. CO.—Aug. 31. Location, Arizona. Capital stock, $10,000,000. Directors—Wm. Shea, F. Stolle, J. Moore, D. Murray, J. F. Mahoney.

HOMESTAKE M. CO., NEV.—Capital stock, $10,000,000. Directors—Frederick Nauart, Maurice Newburg, Hermau F. Schlerhold, Chas. W. Lamar and Louis Osterreleber.

A New Wet Process of Extracting Silver.

According to the London *Mining Journal*, an important advance has been made upon the methods of Augnstin & Ziervogel for the extraction of silver hy the wet process. It is the process of J. F. N. Macay, of Charapoto, Ecuador, which the *Journal* pronounces to be much more effective than the older methods.

"His process relates to the nse of cupric chloride and sodic chloride in solution, for extracting the silver, lead and copper from ores containing all or any of these metals in chemical combination with sulphur, or, in the case of eilver, with chlorine us well as snlphur, or in the case of copper, with chloride and oxygen (cnpric oxychloride), whether these sulphides (or chloride, or oxychloride) may he chemically oombined or mechanically mixed with other mineral in a simple or complex matrix. When cupric chloride csnnot be obtained to commence the proocss with, it may be prepared by mixing together in solution 1,000 parts by weight of cuprio snlphate crystalized, and 469 parts by weight of sodic chloride. The chemical reaction which takes place yields cupric chloride and sodic sulphate; or cupric chloride may be msde by digesting black cnpric protoxide and sodic chloride in sulphuric acid, whereby cupric chloride and sodic and sulphate are formed. Also, hy digesting blsck cupric oxide in hydrochloric acid, whereby water and cupric chloride are formed. The cupric chloride may be made by either of the ahove methods, or by any other method, either in the presence of the ore to be treated or separately, hut hé prefers to make it separately. He also makes it in the presence of the ore when he treats atacamite, or instead of atacamite he uses pure cupric oxychloride, and treats it in the same way, according to the process for making colcothar and cupric chloride, which he has likewise patented.

It is explained that when lead ores are to be treated, and cupric chloride has been prepared by either of the first two ways mentioned, the sodio sulphate formed must be decomposed hy adding a solution of calcic chloride, whereby calcic sulphate and sodic chloride are formed. The calcic sulphate heing insoluhle is separated hy decantation, or by filtering off the liqnid. Thus a solution of cupric chloride and sodic chloride can be obtained free from any sulphate. In treating any other ores the sodic sulphate does not interfere with the process, although he still prefers to decompose it and separate the calcic sulphate which is produced. Rain water should he used for the solutions of the salts of copper and sodium, and for washing the residues. Where rain water cannot be obtained, water acidulated with a little hydrochloric acid may be used, care heing taken when treating silver ore to remove all traces of acid from the residue before treating it with the sodic hyposnlphite solntion. For milling purposes, he uses a kind of arastra or tahona, so constrncted that no metallic part shall he exposed to the action of the cupric chloride, and consisting of a circular base plate of granite or other hard stone cemented togetber and enoircled by a water tight rim, stone mullers being made to rotate upon the base plate.

"According to the first method, the ore is ground and passed through n sieve, having by preference 120 meshes to the linear inch; it is then covered with a strong solntion of cupric chlorlde and sodic chloride in an iron pot glazed iuside. The mixture is concentrated to a pulp by heat. Ahout five parts of onpric chloride are used to one part of sodic chloride. The thick pulp is ground in the arustra (for so it may be called), which is kept heated hy live steam blown iu. This operatiou continues ahout two hours, after which the pnlp is transferred into a leaching wooden vat provided with a wooden stirrer, and is suhmitted to a distinct process, according as the ores under treatment are silver, copper, lead or complex ores. Silver ores treated hy this proces for the silver only generally occurs in nature as sulphide or as chloride of silver, pure, or mixed with native silver or gangue. When sulphide of ores are under treatment, two molecules of cupric chloride, hy giving two atoms of its chlorine to the sulphide of silver, forming silver chloride will have heen converted into cupreous chloride, the sulphur hecoming liherated. The cuperous chloride and some of the silver chloride are kept in solution by the cupric and sodio chlorides in solution. In the leaching vat the liquid of the pulp is filtered off, and the residue is washed two or more times with a solution of sodic chloride, in order to carry off the cupreons chloride left with the residue after the first filtratiou. Then the washing of the residue is continued with hot acidulated water until no more copper salts romain iu solution (which ie ascertaioed by testiug with ammonia), and afterwards with plain water to remove all free acid. After tbe residue has been washed, as stated ahove, and when entirely cold, he proceede, as in Von Patera's prooess—that is, treating the reeidue with a cold dilute eolution of sodic hyposulphite, in order to entirely diseolve the eilver chloride whicb has been left with the residue. The stirrer ehould he kept iu motion during the whole of the ahove operations. After all the chloride of silver has been diesolved, the hyposulphite eolution ie filtered off, and tbe reeidne is repeatedly washed with cold water, until all traces of the eodic hyposulphite (which holde the eilver chloride in eolution) have been extracted from the residue, wbich contains sulphur and the gangue or matrix.

"The silver chloride held iu solution by the sodio hyposulphite solution is transferred into an earthenware or iron pot glazed inside and boiled with pulverized sulpbur in the proportion of about seven parts of sulphur to one part of silver, nntil all the silver of the silver chloride has been precipitated as silver sulphide, leaving in solution the sodio hyposnlphite unchanged and ready, after being dilnted, to he used again. Mr. Macay ascertains when all the silver chloride has been converted into sulphide by a simple process of testing which he describes. The sodio hyposulphite is then separated from the silver sulphide by filtration, and the insoluhle silver sulphide washed. The silver chloride held in solutiou hy the sodic hyposulphite can also be precipitated hy any soln·hle sulphide, as, for example, sodic sulphide instead of with sulphur, whereby silver sulphide and sodic chlorides are produced. The sodic hyphosnlphite is filtered off, and he proceeds to wash the residue, composed of silver sulphide, as before stated. Wheu the silver is precipitated from the hyposulphite solntion in this way by any soluhle sulphide, care must be taken not to put an excess of this last reagent or to neutralize this excess, because if an excess he present, the sodic hyposulphite solution will not be fit for use again until it has been freed from any soluble sulphide, whicb can be readily done by putting more silver chloride into the solution to exhaust the excess of the soluble sulphide. As an alternative process, the residue from the leaching vat, instead of being treated with a cold dilute solntion of hyposulphite of sodium, as in Von Patera's process as already mentioned, may he treated, as in Ziervogel's process, with strong hot brine, in order to dissolve the silver chloride, from which solution the silver instead of heing precipitated in the form of sulphide, may be precipitated in the metallic state by metallic iron, whereby ferrous chloride is at the same time formed.

"The final step is the reduction of the silver sulphide to the metallio state which is thus effected: When sufficient silver sulphide has been collected, it is boiled with cuprid chloride and sodic c·loride, evaporated and in some cases ground in the arastra; the silver chloride produced by this re·action, after being freed of all copper salts, is next dissolved in a hot saturated solution of sodic chloride, which ie separated from the sulphur hy filtration. The sulphnr is dried and pulverized to he used again, and the silver chloride in solution is precipitated hy metallic iron, whereby metallic silver and ferrous chloride are produced. The metallic eilver (cement silver), so formed, is melted into ingots, and the ferrous ohloride is kept for producing colcothar and cuprid oxychloride according to another inventiou. With regard to the treatment of the filtrate from the leaching vat residue, Mr. Macay explains that the filtrate from the leaching vat and the two following brine washings are collected together and hoiled with the metallic copper to decompose the chloride of silver which is held in solution therein and precipitated in the metallic state.

"When all the silver has been precipitated, the liquid is filtered off, and treated as hereafter mentioned, and the precipitate is washed first with hot brine and afterward with very weak acidulated water, to free it from any copper salt, and this precipitated cement silver is then melted into ingots as usnal. As to the last mentioned filtrate the excess of metallic copper remaining after the silver is precipitated is removed from the liquid, which is to he sufficiently diluted with the acidulated water washings that have been used in the leaching vat to precipitate the cuprous chloride, whicb comes down in the form of a white crystalline powder, leaving in solntion cupric chloride (when this salt has been used to excess) and chloride of sodium, which are filtered off from the cuprous chloride, and are ready to be used again for treating fresh ore. The other washings of the leaching vat, which contain very dilute cnpric chloride (when this salt has been used) in excess and chloride of sodium, are concentrated hy any economical means, and used again for the chlorination process. As regards the cuprons chloride precipitate, he first exposes it to the action of the atmosphere in a very thin layer until it has been converted in a cupric oxychloride by the oxygen of the air. He employs the cuprio oxygen so obtained in the production of coloothar, according to his special process, wherehy the cupric oxychloride is at the same time converted back into cupric chloride for nse again iu the treatment of ores. Mr. Macay mentions that silver which is found as a mineral in combination with chlorine is almost entirely soluhle in a hyposulphite solution or in brine, but it is rendered directly soluhle therein when the ore is treated accordiug to the process ahove described for silver sulphide, which process can, therefore, be equally well employed for chloride of silver ores.

"The improved process, as already mentioned, ie applicahle to the treatment of copper, lead and complex ores, as well as eilver; hut theee modificatione need not at present be referred to. Ae applied to treating silver ores, the chief novelty of Mr. Macay's process, considered as a whole, consists in treating the raw ore direct without the nse of mercury, which is very expensive. It has already been eeen that he nvoide the necessity of roaeting, and that it is a regenerative process—the reagente required in one part of the process being reproduced in another part, and Mr. Macay has now added some further improvements ip details by the use of which the filtration, hitherto very difficult, oan be done in three bours; indeed, to euch perfection has he brought this branch of the process, tbat even when the filtrates are in a state of impalpable powder, he can effect the five filtrates in three and one-half honrs. The whole process appears to have much to recommend it, and is likely to come largely, if not exclusively, into use, wherever silver ores are worked."

The Sulphurets Utilizer.

This is the name given to a metallnrgical process invented hy Dr. McGraw, of Boulder, Col. The following description of his method hy the inventor we republish from the Boulder *News and Courier:* "The sulphurets ntilizer consists of an apparatus for utilizing the scums from pulverized ore as it passes from the stamp mill, or pulverizer, to the concentrator, which scum, owing to the light specific gravity of its rich minute particles, has ever floated off upon the surface of water as waste, whioh particles being porous and their cells heing filled with air, prevents them from being precipitated until the action of water ehall have forced the air from out their cells; and it is to meet the reqnisite detention of these particles, until precipitation has taken place, that characterizes the true mechanism of my process. The machine first acts upon the ores by separating the heavy from the light, which it does in n prompt ns well as a heautiful manner, the ore entering a funnel-shaped pan through a pipe directly against the side of the pan, exactly opposite a compressed lip for the exit of the scum, the pan having at its hottom an automatic valve for the discharge of the bulk of the water and all of the heavy portions of the ore, which valve is controlled hy floats in adjacent cylinders communicating with the sides of the pan in such a manner that a constant level is preserved to secure the oonstant discharge of the scum over the depressed lip, from which the scums are thrown into a series of tanks for the settling of the light mineral. To facilitate the scumming process, the pipe that conducts the water and ore to the pan enters below its upper edge and thus curves upwardly aud outwardly so as to direct the entering stream full against the side of the pan, causing a double wave or ripple on the surfaoe of the water, one of which passes to one side of the pan and the other to the other side, so that when these two ripples meet at a diametrical point an outward or radical current is the result, which causes the lighter ores to pass over the depressed lip of the pan and into the tank below. As the light ore is thus thrown into the settling tank with a small amount of water, the water passes off through a series of partitions arraoged with transverse openings, the first near the bottom, the seoond near the top, the third near the bottom, while the fourth compartment, or discharge end of the tank, is controlled by a float valve, whioh maintains a constant level of the water, holds the water quiesoent and oauses the disoharge to be oommensurate with the inflow. It follows that all of the light metals so acted upon by this machine are found precipitated at the bottom of the first aud second compartments of the tank and ready for the smelter, instead of floating down our rivers to be precipitated in the bottom of the sea."

Experiments in Reducing Ores.

Many of the mining districts in this oountry are idle for the reason that, at present, they oannot be profitably worked; the ore is of too low a grade to stand the cost of reduoing it to bullion. But the many and varied experiments which are daily being made, have only one aim in view, that of makiug availahle ore which cannot now he successfnlly worked. Many of these attempts result in failure, it is true, and some of the ideas advocated ure not based on sound scientific principles. This is to he expected and no possihle harm can come of it. It took long years of weary toil—and many were the failures experienced—before many of those agents were brought into general use which have done so much to help along the advance of civilization. But the right man took hold of it at last, and since then it has been plain sailing. There are vast tracts of this low-grade ore waiting for tbe time to oome when genius aud capital combined will have solved the problem. That that time will oome there is not the slightest doubt. Even now the cost of redncing mineral has been wonderfully rednced and is heing all the time. Mining is a great industry, probahly as important ae there is in the world to-day, and any one who helps to advance that industry generally makes a fortune for his pains, that is, should his idea come into general nse, which it is bound to do if it is an improvement on the methods in vogne before his diecovery. Tberefore, all this experimenting which is going on in the mining world cannot bnt redonnd to the benefit of the industry and open np new fields for work which have so long remained idle for tbe want of means by which to add their great deposits of wealth to the world's etore.—*New Mexican Mining News.*

THE receipts of New York Hill at Grase Valley for the fiscal year ending July 29th, were $230,000, and the disbursements $235,000, inclnding $108,500 in dividends to stockholders. The amount of cash on hand at the close was $12,476, a decrease of $5,300 as compared with the balance carried over from the previoue year.

THE Southern Utah towns are nearly all depopulated of men, by reason of the demande of the railroads now being oonstructed in that part of the Territory. Good wages and prompt pay are great inducments to them.

Arizona Gold Mines.

The attention of prospectors and capitalists in Arizona, has been turned for the most part to silver mining. Its extensive and rich leads of that character of ore, and the generally low grade of the gold ore, as well as the suspicion that the gold would turn into silver when depth was attained have been the canses. There are in this district, a few miles northwest of Globe, numerous veins of gold-bearing quartz, and from the gulches in that vicinity a great deal of nugget gold has heen obtained. The veins are frequently of fair size, and the ore is of a higher grade than many of the most successful gold mines of the Pacific Coast has produced. In Maricopa county, the Vulture mine is worked successfully, though it is a long distance from watcr, and the average of the ore is $8. It pays dividends. The cost of reducing is said to be $2 50 per ton. There are nnmhers of gold mincs in Southern Arizona, some of whioh are beginning to attract attention. In Yavapai county are, without douht, the richest and best defined gold leads in the Territory. At the upper end of what is called the Tonto Basin, there are several excellent properties among which the Nash, the Excnrsion and the Gowan are the best known, and most developed. All of these are in good formation, are certainly fissures, and carry high-grade ore; the Nash particularly so. In Yuma county there are a great many gold mines, and its placer mines have yielded more than all the rest of the placers of Arizona. We hope soon to see our gold mines. gaining the attention their great extent and merits entitle them to.—*Silver Belt.*

CALAVERAS MINING INTEREST.—The mining interest in this vicinity has heeu improving steadily for the past few years and still continues to prosper. It is evident that the fact is being realized that wealth still exists iu the gravel hills, and that the old river channels have not heen completely robbed of the precious metal. Claims which were abandoned iu former years and thought to be worked out have heen undertaken again, and, with sagacious management, are heing made remnnerative property. There is not an acre of land, to our knowledge, in this vicinity where there is any prospect of the existence of auriferous matter, even in small quantities, which is not claimed. The various gravel channels whose courses through the hills can he pretty accurately traced hy those familiar with the country and the mining of former years, are now considered worth looking after. They have not heen worked out hy any means. More gold hy far than has ever beeu taken out still lies buried iu the depths of those channels, and with the facilities now obtainable for conducting mining operations, they will he made to yield their wealth.—*Calaveras Chronicle.*

MILL SITES AND LODE CLAIMS.—The Commissioner of the General Land Office, in a letter to a Register aud Receiver, says: I am in receipt of your letter Section 2337 U. S. Revised Statutes provides: "Where non-mineral land not contiguous to the vein or lode is used or occupied by the proprietor of such veiu or lode for mining or milling purposes, such non-adjacent surface ground may be embraced and included in an applicatiou for a patent for such vein or lode." The language of the statute is plain nud unambiguous, and I am of the opinion thut u proper constructiou of it requires the applicant for u patent for a lode aud mill site to furnish satisfactory proof that the tract of laud applied for as a mill site is non-mineral in character, and that it is used or occnpied by the proprietor of the vein or lode to which it is appurtenaut for mining or milliug purposes, and the proof should consist of the affidavit of the claimant corroborated by disinterested witnesses cogniZant of the facts.

THE SPEED OF VESSELS.—Ensigu Hogg of the navy has invented a speed indicator for veseels, which has heen found to work satisfactorily. The device consists of a tin fnnnel, shaped like an old-faebioned dice-box, open at both ends. Froms it extend four hollow metel tnhes meeting ahout six inches from the funnel nnd ending in a rubher tuhe whicb is several yards in length, and has the other end fastened to an arraugement on deck which looks like a barometer, but so constructed that the mercnry is not effeoted by climate change or capillary attraction. The speed of the vessel causes the water to rush through the cylinder and suck air out of the tubes. This makes the mercury rise in the glass, and a graduated scale shows exactly the speed of the vessel.

CURIOUS PROPERTIES OF MAONETIC IRON.—A curious magnetic property of the meteoric iron of Santa Cattariuu (Brazil), hus heen lately observed hy Professor Lawrence Smith. of Louisville. Small detached fragmeuts uot weighing more than 0.1 to 0.5 graine were very weakly affected by a maguet; but, on heing flatteued on a piece of steel with a steel hammer, they hecame very sensitive to it. By heating red hot, the particles were made to he still more easily attructed thau hy flatteuiug. The meteoric iron in queetiou contains 66 iron, 34 nickel.

AN American writing from Mexico eays of the Mexioo mining laws: The nniversal verdict is, that they are very generous and faultless, and are in every case eo interpreted by those in power. The local lawe are promptly administered, and that without delay or cost to any one of tbe partiee concerned. A foreigner has all the protection he can desire.

The Engineer.

Conditions as a Factor in Engineering.

In plotting out work of an original character and design, an engineer is greatly dependent upon precedents. The particular behavior of this or that detail cannot be foretold, and the only reliance he can have for the success of his plans is a knowledge of what the action of similar parts has been under conditions akin. Where there are no precedents his sagacity must act in lion of precedent, or rather his mechanical faculty must assert itself and rise superior to it. It is thus that new works are originated, and it is thus that bold schemes fail. When they succeed it is for the reason that the constructive faculty of the originator told him that they would. When they fail the converse is true; too much was assumed of the action of certain parts, and too little allowance made for a change in the conditions. And it is here that the pertinency of our caption appears—nothing in the range of the profession is more fickle than conditions.

A balanced slide valve under 50 lbs. pressure works harmoniously and satisfactorily; but under 100 lbs. pressure there may be difficulties which prevent its action. A certain size of cylinder, with a certain length of stroke, operates a given shaft at 50 revolutions per minute without heating; but ran the speed up to 75 revolutions per minute, and troubles begin at once. The difficulties encountered are caused by a change in the conditions, not in the function of the machine, and they are often baffling in the extreme to locate and remove.

The observations just made in regard to engines apply equally to boilers, or any other appurtenance, particularly to boilers, for we have more to learn about them than any other detail of the business. Why, of two boilers of stated capacity and precisely similar design, one should evaporate more water than the other under apparently identical conditions, seems mysterious on the face of it; but searching investigation will reveal the cause to be a change in the conditions under which the respective boilers are worked.

The practical application and value of our articles lie in the fact that a change of the conditions a machine works under, will often utterly destroy its value for any other than a specific duty. To adapt it to others, a different arrangement of details is required. These changes are sometimes so great as to amount virtually to making another machine.—*Ex.*

A Railroad in the Tree-tops.—It may not be known outside of the neighborhood where it is situated, but it is nevertheless a fact, that in Sonoma county we have an original and successful piece of railroad engineering and building that is not to be found in the books. In the upper part of this county, near the coast, may be seen an actual roadbed in the tree tops. Between the Clipper mills and Stuart's Point, where the road crosses a deep ravine, the trees are sawed off on a level and the timber and ties laid on the stumps. In the center of the ravine mentioned, two huge redwood trees, standing side by side, form a substantial support and they are cut off 75 ft. above the ground, and cars loaded with heavy saw logs pass over them with as much security as if it were framed in the most scientific manner. "All roads lead to Rome," except this one. The builders never contemplated a terminus at San Francisco, Petaluma or Chicago, but merely to convey heavy timber from the woods to their mill. There are many places in our redwood forests where this example might be followed profitably, as it would be cheaper to grade through with a cross-cut saw and lay the ties on the stumps than to remove the trees. We can boast of a broad-gauge, a narrow-gauge, and a road in the tree tops—yet we are not all happy.—*Petaluma Argus.*

Drainage of the Zuyder Zee.—It seems that the Government of the Kingdom of Holland is determined to conquer the Zuyder Zee, which has an area of 20,000 hectares. The engineers in charge of this work have been engaged for the last 10 years preparing the plans, the total cost of which is estimated at least $46,000,000. The dyke will be 41 kilometers in length, and will extend from the city of Enkhuisen to the coast of the province of Overyssel. The top of the dyke will be built to the hight of five meters above the level of the sea, which will bring it 2.05 meters above the highest tide. The dyke will be formed from sand and faced with clay. It will be built of sufficient size to resist the heaviest seas. The work will be started at four different points, and is calculated to be completed in from seven to ten years.

Connecting the Bay of Biscay with the Mediterranean.—M. Lepinay has drawn up his report regarding the canal to connect the Bay of Biscay with the Mediterranean. He proposes that the canal start from Bordeaux, and after traversing 252 miles, terminate at Narbonne. The number of locks would be 62, and long enough to admit vessels of 439 ft. in length. The depth would be 27 ft. 9 inches, and the breadth at the surface where the canal is to be of single width, 184 ft., and where it is to be of double width, 262 ft. The estimated cost is $110,000,000. By means of this canal ships using steam can go from sea to sea in 54 hours.

Useful Information.

Paper Blankets.—By a recent invention the domain in which paper plays its part in the general economy of things has been materially widened. To a Manchester firm of the name of Henry & Leigh Slater, says the *British Trade Journal*, belongs the credit of utilizing paper in this especially serviceable direction. At once cheap, cleanly, warm, light and easily manipulated, paper seems expressly designed for the purpose to which it is now for the first time successfully applied. Of late years various attempts have been made to turn it to account in the manner described; but, owing to the crackling nature of the paper and the impossibility of securing free ventilation beneath paper coverings, the idea was abandoned again and again. In the production of the "Chartaline" blanket, as the new invention is called, these defects have been overcome in a most satisfactory manner. Ventilation is obtained as full, free and perfect as takes place beneath an ordinary woolen blanket. The new bed covering is made of two sheets of paper, between which a layer of wadding, chemically prepared, is inserted in such a way that it cannot gather together in lumps. The edges are strongly whipped, so that there is no possibility of a separation of the two pieces taking place. The paper is manufactured from the strongest fibre known, which, being softened by a special process, is free from the objectionable crackling and rustling sound that, as a rule, accompanies the manipulation of paper. It is true there is a slight crisp feeling when new, but this soon wears off and the coverlet becomes soft and limp. At the same time, the strength of the "Chartaline" blanket is much greater than might be imagined, having regard to the character of the material from which it is manufactured. As far as looks go, the new blanket has all the appearance of a woolen one, while the warmth it affords exceeds that of its predecessor when the size and weight of the two are brought into comparison. The trifling cost at which these serviceable articles may be obtained constitutes, however, when all is told, the chief advantage of the invention.

A Curious Gas-producing Substance.—The gas-producing substance—a kind of sun-baked clay, of a light brown color—recently found in Mexico exhibits, on analysis, the following chemical composition: Moisture, 2.71; hydrocarbons, volatile at a red heat, 71.00; fixed organic carbon, 8.99; ash, 17.30. The ash is constituted mostly of grains of quartz, and the hydrocarbons—much larger in quantity than is afforded by the best bituminous coals—gave, when burned, a clear, luminous flame, apparently free from sulphur vapors. Distillation affords a red oily substance, of nearly the consistency of butter and having a very offensive odor, which, however, is not perceived when burned. The origin of this mineral is not clear, but is thought to be due, probably, to causes similar to those which originated the oil-bearing strata of Pennsylvania. It is assumed that, in such instances, gaseous hydrocarbons are formed from the decomposition of organic remains, which become liquid under pressure, and the liquid is readily absorbed by disintegrated rock or quartzose sand. The structure of this substance is said to show lamination—proving that it has been under great pressure.

Fired by Electricity.—An interesting illustration of the danger attending the manufacture of some kinds of rubber goods was shown in the origin of the recent fire which occurred in the Ætna Rubber Mills, at Jamaica Plains. The cement which fastens the seams of rubber coats is largely made of naphtha. The mere act of lifting a piece of rubber cloth from a pile of half a dozen similar ones, cut for garments, developed so much electricity that a spark was observed to escape. It came in contact with the naphtha cement, or with gases arising from it, and instantly the whole room was in a blaze. Fortunately, the fire was extinguished without destroying the mill, the loss being about a thousand dollars. It is not known that anything can be done to prevent the occurrence of another accident of this kind, whenever all the atmospheric conditions are favorable. One would suppose, however, that a certain degree of dampness would remove all danger from that source.—*Boston Commercial Bulletin.*

Delicate Iron Work.—The precision to which scales and tools are now made is most wonderful. A bolt has been made to fit so delicately into an opening in a piece of iron that when the bolt has been held for a short time in the hand, the expansion is so great that it cannot be made to enter except by the use of much force; yet, when at the normal temperature, its own weight will settle it to its seat. The scales used for weighing gold in the Assay Office at New York are so delicate that, when brought to a balance with two pieces of paper of equal size in the pans, the mere writing of a name with a lead pencil on one of the pieces of paper will add enough weight to the paper to turn the scales in its favor.

Intermittent Electric Light.—A French electrician has devised a form of electric lamp by which intermittent luminous signals can be produced. A cam motion is used, by which the carbons are separated at each revolution, and can be operated by clock-work for regular signals or by hand, at a variable rate, for the irregular ones.

The Sand Blast.—Among the wonderful and useful inventions of the times is the common sand blast. Suppose you desire a piece of marble for a gravestone, you cover the stone with a sheet of wax no thicker than a wafer; then you cut in the wax the name, date, etc., leaving the marble exposed. Now pass it under the blast, and the sand will cut it away. Remove the wax and you have the cut letters. Taking a piece of French plate glass, say two by six ft., cover it with fine lace and pass it under the blast, and not a thread of the lace will be injured, but the sand will cut deep into the glass wherever it is not covered by the lace. Now remove the lace and you have a delicate and beautiful figure raised upon the glass. In this way beautiful figures of all kinds are cut in glass, and at small expense. The workmen can hold their hands under the blast without harm, even when it is rapidly cutting away the hardest glass, iron or stone, but they must look out for finger nails, for they will be whittled off right hastily. If they put on steel thimbles to protect the nails, it will do little good, for the sand will soon whittle them away; but if they wrap a piece of soft cotton around them they are safe. You will at once see the philosophy of it. The sand whittles away and destroys any hard substance, even glass, but does not effect substances that are soft and yielding, like wax, cotton or fine lace, or even the human hand.

A Large Monolith.—At a granite quarry in Westerly, Rhode Island, there was recently detached a monolith 150 feet long, 10 feet wide, and 8 feet thick, weighing over 1,000 tons. These dimensions greatly exceed those of the Obelisk of Semiramis, the largest of the Egyptian monoliths. The stone was loosened by one oblong blast-hole in such a simple and perfect manner that the theories and conjectures advanced by many as to the methods of the Egyptians appear absurd. It contains over 12,000 cubic feet of granite which, cut into smaller blocks, will fetch about $30,000. Mr. French, the engineer in charge, is quite positive that it could be taken to New York city, finished as an obelisk, and erected for about $150,000.

Potato Flour, or the dried pulp of the potato, is attaining great importance in the arts. It is stated that in Lancashire, England, 20,000 tons of it are sold annually, and it brings at present in Liverpool about double as much in the market as wheat flour. It is used for sizing and other manufacturing purposes, and when precipitated with acid is turned into starch. When calcined it is employed as a dressing for silk.

Graphite as a Conductor—Herr Muraski finds that graphite is better than any other carbon, and that its resistance is also most sensitive to variation of temperature.

Ice as a Burning Lens.—A glass globe full of cold water, or even a lump of ice, will, in the sun's rays, act as a burning lens.

Good Health.

How Milk Should be Taken.

Milk is a food that should not be taken in copious drafts, like beer or other fluids which differ from it chemically. If we consider the use of milk in infancy, the physiological ingestion that is, of it, we find that the sucking babe imbibes little by little the natural food provided for it. Each small mouthful is secured by effort, and slowly presented to the gastric mucous surface for the primal digestive stages. It is thus regularly and gradually reduced to curd, and the stomach is not oppressed with a lump of half-coagulated milk. The same principle should be regarded in the case of the adult. Milk should be slowly taken in mouthfuls, at short intervals, and thus it is rightly dealt with by the gastric juice. If milk be taken after other food, it is almost sure to burden the stomach and to cause discomfort and prolonged indigestion, and this for the obvious reason that there is insufficient digestive agency to dispose of it; and the better the quality of the milk, the more severe the discomfort will be under these conditions.

Milk is insufficiently used in making simple puddings of such farinaceous food as rice, tapioca and sago. Distaste for these is engendered very often, I believe, because the milk is stinted in making them, or poor skimmed milk is used. Abundance of new milk should be employed, and more milk or cream should be added when they are taken. In Scottish households this matter is well understood, and a distinct pudding plate, like a small soup plate, is used for this course. The dry messes commonly served as milky puddings in England are exactly fitted to create disgust for what should be a most excellent and delicious part of a wholesome dinner for both children and adults.—*Popular Science Monthly.*

The Appetite of Bread.

Did you know that bread was not only eaten but eats? Darwin has told us that some flowers enjoy a porter-house steak. Now M. Scheurer Kestner assures us that bread has a partiality for hogs and hominy. This discovery is interesting to dyspeptics, for bread can be made to do the work of the alimentary canal and relieve dyspeptics of all bother except mere deglutition—and of course, paying the baker's bill, which is harder work than digestion. Science has since found that several vegetable juices or saps dissolve meat, but M. Scheurer Kestner is the first person who observed that in the process of bread making a peculiar fermentation takes place which produces complete digestion of meat. A beef steak hashed fine and mixed with dough containing yeast disappears entirely by the time the bread is taken from the oven. The steak's nutritive principles are dissolved and incorporated into the bread. Not the least curious phenomenon noticed in these circumstances is that meat, which so rapidly becomes putrid, when once incorporated into bread may be kept longer than ordinary bread. Bread made in 1873 has been shown the Academy of Science; it was as sweet and free from mold as when it came out of the oven.

At first M. Scheurer Kestner used raw meat; he mixed one and one-tenth pounds of flour, one pound of leaven and three-fourths of a pound of raw beef minced fine; water in sufficient quantity was added, and the dough was left to ferment. In two or three hours the meat had disappeared. The bread was then baked as usual. This meat bread had a disagreeable, sour taste. To remove it M. Scheurer Kestner first boiled the meat in just the quantity of water necessary to wet the flour and used this water in kneading. The meat should be rid of all fat, and only salt enough to season the bread added; for if too much salt be added the bread will become humid (salt being a great absorber of water) and spoil. The objection to this bread is that it is insipid. If bacon be used instead of beef the objection is removed. Veal, too, makes a delicious meat bread. All these breads may be used to make soup. Cut in slices one-sixth of a pound of this bread, put the slices in a quart of water, salt to taste and boil for 20 minutes.—*New Orleans Picayune.*

Deaths from Industrial Pursuits.

Some startling facts respecting the amount of sickness and death which result directly from the circumstances under which industrial pursuits are carried on, have lately been discovered in England, where they have been brought to the attention of the authorities as a subject worthy of investigation with the view of amelioration. One statistician who compiled tables on this subject in 1877, giving the records of deaths and injuries by steam boilers, in mines, on railways and in factories, estimated the mortality in England from these causes, during the four years preceding 1877, at a total of 107,000 men, women and children; and he estimated, on the basis of these facts, that 500,000 workmen will lose their lives during the ten years from 1877 to 1886, from the following causes, namely, 300,000 in mines, 70,000 on railways, and 130,000 in factories.

Another writer on the same subject, criticising these figures, thinks they are altogether too small, and that the accidents reported comprise only a small part of those that actually take place. He is of opinion that not less than 100,000 persons are annually killed in England from causes directly resulting from the industrial occupations in which they are engaged.

These statements, which are doubtless based on reasonably accurate data, are sufficiently appalling to arouse from its traditional *sang froid* even so inert and conservative a body as the British House of Lords. Taking even the lowest estimate of mortality from industrial accidents as the safest basis for estimating the number of yearly deaths from such causes the world over, and it will be found that the "horrors" of war, with its reckless sacrifice of human lives, become far less horrible when a comparison of the number of victims is instituted.

How Koumiss is Made.

This article, sometimes called "milk wine," or "milk beer," which was sold quite extensively in this city some two or three years ago, and which has recently formed an important article of diet in the critical case of President Garfield, is made as follows: Into one quart of new milk put one gill of fresh buttermilk and three or four lumps of white sugar. Mix well and see that the sugar dissolves. Put in warm place to stand ten hours, when it will be thick. Pour from one vessel to another until it becomes smooth and uniform in consistency. Bottle and keep in warm place 24 hours. It may take 36 in winter. The bottles must be tightly corked and the corks tied down. Shake well five minutes before opening.

It makes a very agreeable drink, which is especially recommended for persons who do not assimilate their food, and for young children may be drunk as freely as milk. Instead of buttermilk, some use a teaspoonful of yeast.

It is the standard beverage of the Tartars, who almost live upon it in summer, and is also used largely by the Russians.

Caution.—The richer your milk, which should be unskimmed, the better will be your koumiss.

Professor Stevenson, of the Smithsonian Institute, is organizing at Fort Wingate, his geological and surveying party. The Professor's work for the present will be the establishment of a base line 12 miles in length, to be used in triangulation. A number of naturalists and special scientists are included in the party, and they will explore the western part of New Mexico and the eastern part of Arizona.

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Passing Events.

The country has passed through a week of anxious expectancy owing to the crisis in the case of President Garfield. He has passed the turning point safely, however, and is now apparently on the high road to recovery.

We devote a large share of our space this week to an exhaustive article descriptive of the cable railroad system of San Francisco. To railroad engineers this is of special interest, as this cable system has been so successful here, it will no doubt come into vogue elsewhere. In fact, in Chicago, a road is now being built to be operated by endless cable. The details have all been worked out here with great care, and many obstacles overcome.

We also give space to a complete catalogue of the Mechanics' Institute Fair, now open in this city, and give descriptions of many prominent exhibits.

Our mining summary gives all the recent news of interest from mining regions. In this State, many hydraulic mines are now shut down, owing to the injunctions; but otherwise the mining interests are very prosperous.

THERE is great excitement in Georgia over reported gold discoveries.

Mining Machinery at the Fair.

Although the display of mining machinery at the fair this year is not extensive, since none of the large foundries are represented, yet there are several new things of interest to mining men, and these we briefly describe in the following paragraphs:

Mr. Frank A. Huntington has several things on exhibition, all of them interesting to mining men. The oscillating quartz mill we have before illustrated and described in detail. It is now in use in many places on the coast, and is no longer an experiment, having stood the test of practical work in a number of localities for over a year. It has no stems, cams or tappets, and both crushes and grinds the quartz.

Mr. Huntington's grinding and amalgamating pan, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, has attracted considerable attention. On the vertical sides of the pan, near the bottom, are supported dies, in sections, but like a complete ring, so as to receive the action of the revolving shoes, which are journalled upon vertical spindles. When these are driven by the action of a revolving muller, the shoes are thrown outwardly against the dies, both by centrifugal action and by the resistance of the contents of the pan to wings which project inwardly from the shoe supports. Suitable means are employed to keep up a good circulation in the pan. There is no danger of grinding or flouring mercury with this pan. More or less grinding action may be maintained.

Mr. Huntington has also on exhibition the Patten rocking and panning amalgamator which he manufactures for saving fine or coarse gold and floured quicksilver. This machine consists of a rocking bed having an amalgamated surface, and the pulp is compelled to pass between two amalgamated surfaces, one above and the other below, so that "float gold" and floured mercury is amalgamated.

The Patten concentrator, also made by Mr. Huntington, combines the rocking and percussion motion, which allows it to be set up with the pulp or gangue discharge end highest—the reverse of other concentrators—and by this means it is less liable to carry off the mineral with the gangue, and it is enabled to do good work. This, as well as the other machines here described, should be seen and carefully examined by mining men to be appreciated. Mr. Huntington's shop is at 220 Fremont street.

Brinckman's quartz crusher and pulverizer is the first one of the kind ever exhibited. It has a capacity of one ton per hour, fine enough to pass through a No. 40 screen. The mechanism is simple, and it takes 10 horse-power to drive the machine, the ore being run through either dry or wet. All the machine's parts that are subjected to wear and tear can be replaced, and the wear and tear will be almost the same as to a common stamp mill. The machine works without much noise, and when crushing dry, causes little dust. The principle of the machine is that of a semi-circular mortar, the bottom of which is formed like the grate bars of a furnace, for the ground ore to pass through. The mortar is lined with shoes, and made of white iron. On these shoes are placed solid cylinders of white iron. On these cylinders rests a cylindrical muller of about 3,000 lbs. weight, this being shod with white iron. The muller is provided with a lever, through which an oscillating motion is imparted to the same. Through the center of the muller lengthwise passes a shaft, extending on both sides sufficiently to allow the admission of bearings. On these bearings wooden-pressure beams create an elastic action, making it possible to cause a pressure of 50,000 lbs. or more on the muller when in operation. A peculiar feature of the bearings is that they slide from one side to the other, throwing the center of the shaft from its fulcrum, and creating thereby an eccentric. Several patents on this invention have been procured through the MINING AND SCIENTIFIC PRESS Patent Agency, and others are pending.

Matheweon's patent circular-rotating cam and straight-stamp quartz mill is a device patented not long since through the MINING AND SCIENTIFIC PRESS Patent Agency. The whole frame and all is of iron, and the machine is in very compact form. It can be transported readily, the heaviest piece weighing 600 pounds. The small size (or No. 1 mill) contains 6 stamps, weighing 150 pounds each, making 600 drops a minute. The next size (No. 2) has 10 stamps, weighing 300 pounds each, making 1,200 drops a minute. The little mill at the fair has been carefully examined by a great many mining men.

Dodge's rock breaker, which is on exhibition, is so well known that it needs no special description. There are many hundreds of these breakers in use all over the coast.

Mr. Tustin exhibits a full sized working machine for crushing ore, which is made after his patent. It is an ore pulverizer with automatic feed hopper. We shall before long give a detailed description of this ore grinder, which has been examined with great interest by mining men.

C. Douglas Brown's safety attachment for mining cages, exhibited by Reynolds, Rix & Co. of 49 Fremont street, is a device just patented through the MINING AND SCIENTIFIC PRESS Patent Agency. We illustrated and described this machine in detail a few weeks ago. A full-sized cage with the safety attachment is exhibited.

The Richmaun rock drill and air compressors (patented through the MINING AND SCIENTIFIC PRESS Patent Agency) which are exhibited, we have already described in detail and illustrated in these columns. The company are manufacturing various sizes of these machines, which have now been successfully introduced in several places. The air-compressor mechanism is very effective, and as we have before stated, the drill is a marvel of ingenuity, and one of the most perfect specimens of mechanism ever perfected on this coast.

Stanford's ore mill, invented by the originator of the first of the automatic ore feeders, is a curious looking and operating arrangement. The muller or stamper is a large piece of iron with four removable shoes, which form legs to the muller. This muller has a vertical arm extending upward, by which it is revolved. The revolution causes the muller to oscillate and revolve both, and the shoes in turn strike a solid heavy blow on the quartz in the mortar, crushing it very fine, and at the same time giving it a grind. Mining men examine this machine with considerable interest.

Prominent Exhibits.

Curves on Cable Railroads.

Anderson & Green exhibit a very ingenious yet simple arangement for carrying cable railroad grips around curves in the road. In the cable railroad system in vogue in the city, where the grip connected with the dummy passes down through a slot in the road bed to connect with the moving cable, it works well as long as the road is in a straight line; but on rounding curves difficulties are met with, as pulleys have to be put in to take the strain off the cable, and the grip will not go over the pulley. Anderson & Green overcome this obstacle in an ingenious yet simple way. Pulleys are placed two ft. apart all around the curve, and in the grooves of these pulleys the cable runs. Each pulley has a lever on each side of it. As the grip comes along on the cable it strikes a lever which throws the pulley back out of the way, so the grip clears it. As soon as the grip has passed the pulley, it strikes the other lever which throws the pulley out again and locks it there, this action being repeated at each pulley. The operating mechanism for the levers is positive and simple. The grip passes around the curve without the possibility of striking any of the pulleys, while at the same time the pulleys maintain the cable in its proper position. It only needs a two-foot excavation for this arrangement, and the expense for a double cable is only about $300. There are no extra cables, no stops or lugs and no springs. The pressure of the cable pulls the pulley back, and the lever throws it out again by a positive motion. The inventors inform us that the system has been endorsed by the leading engineers of this city.

New Sewer Gas Trap.

The Titus sewer gas trap, a new invention, is intended to isolate dwellings from the main sewer, thus preventing the prolific cause of disease arising from sewer gas infections. It is simply a peculiarly constructed valve, fitted in a curve in the side sewer connecting the house with the main one. The valve is arranged so that everything from the house can pass out, but no gas or back flow from the sewer can return. In this city this is particularly useful, since the trap acts as a tide-gate, preventing water from entering cellars from the sewer when the tide is high, in the lower portion of the city, when houses are on made ground. It also operates as a flushing-gate to completely clean side sewers. By opening the cover and holding the valve down (and it is constructed with this in view) water is backed up, and by releasing the valve, a sudden flow or rush of water, cleans the side-sewers. This invention is worthy of careful examination by all property owners. It can be seen in the pavilion, or at 1006 Mission street.

An Advertising Clock.

William Akin, of 303 Eddy street, has devised a most ingenious system of advertising, in the shape of an advertising clock, on which he has been at work for some two years or more in order to perfect it. It is automatic in its action. The clock is set up in any public place—such as railway stations, depots, waiting-rooms, etc. Below the face of the clock is a space in which fits the advertisement. This advertising card remains there one minute, when the mechanism releases it and it drops into a similar space below, a new card taking its place. This in turn, at the end of the next minute, drops, and the lower card then disappears and is brought up again behind the others, ready to take its turn again in front. In this way, a new card is displayed every minute in the upper space. The mechanism for changing the cards is quite ingenious. In fact, the whole idea is a good one, as a means of advertising several things in the same space is gained. The inventor is desirous of selling rights.

New Filter Faucet.

THE Challenge filter faucet, patented through the MINING AND SCIENTIFIC PRESS Patent Agency, some little time since by W. M. Sack, is self-cleansing, and in cities like San Francisco and Oakland, where the water contains more or less foreign substances in suspension, it is specially useful. It cannot leak since there is no grooved joint, but instead a simple compression. If a large flow of water is wanted it need not pass through the filter. Through it, however, one can get a glass of pure, clear water, free from filth, bugs or worms.

J. H. Therien exhibits in the machinery department a windmill of very ingenious construction. The fans or wings are of metal and are peculiarly curved. They are so arranged as to automatically open and close as the wind increases or decreases, and in a strong wind remain open, so no motion is imparted to the shaft. The working model is well made, and shows many points of excellence. We shall shortly illustrate and more fully describe this invention.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING AUGUST 23, 1881.

245,991.—FURNACE—Bell & Griffith, Grantville, Nev.
245,994.—PROJECTILE—H. Carr, S. F.
245,943.—DAMPER PLATE AND REFLECTOR—A. Good, S. F.
246,128.—MECHANISM FOR CONVERTING MOTION—Wm. Hanna, Gilroy, Cal.
246,157.—HEADER—M. N. Laufenburg, S. F.
246,003.—FILTER—Bonno Goldman, S. F.
245,902.—FIRE BASKET FOR STOVES—W. H. Loomis, Alameda, Cal.
246,030.—SPRING ATTACHMENT FOR SAWS—E. Moberg, Callahan's Ranch, Cal.
246,032.—MUD CONVEYER—W. A. Phillips, S. F.
246,210.—DEPRESSION PULLEY IN CABLE RAILROAD—H. Root, S. F.
246,051.—GALVANIC BELT—H. C. Warner, Gilroy, Cal.
246,271—STOVE MAT FOR COFFEE POT, ETC.—Elizabeth C. Zumwalt, Port Orford, Or.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

PROJECTILE.—Howard Carr, S. F. Dated Aug. 23, 1881. No. 245,994. This invention relates to certain improvements in projectiles for guns, and it consists in a novel formation of a projectile having the cannelures or grooves formed around its base in spiral lines, which extend to a point near the center of the bullet, where they disappear in a rib on the rear part of the smooth portion of the bullet, which smooth portion continues from that point to the apex. The object of this invention is to provide an opening or openings around the base of the bullet, by which the pressure of the gas will be exerted toward the axis around the rear portion of the bullet, where the explosion of the powder takes place, and thus prevent such an upsetting of the bullet as to cause too great friction within the barrel of the gun. It also serves to distribute the lubricant thoroughly over the space occupied by the cannelures or grooves upon the bullet and within the barrel.

HEADER.—M. N. Laufenberg, assignor to Baker & Hamilton, S. F. Dated Aug. 23, 1881. No. 246,157. This invention relates to certain improvements in that class of apparatus employed for harvesting grain, known as "headers." A difficulty arises when the driving gear is rigidly secured to the axle, on account of the end play of the parts, which often breaks the gear by the forcible contact with the pinion. The inventor overcomes this by a peculiar method of securing the gear to the hub, so that while forced to revolve with the wheel, it will be allowed side play sufficient to relieve it of all this strain.

DESULPHURIZING AND CHLORIDIZING FURNACE.—T. J. Bell and N. A. Griffith, Grantsville, Nev. Dated August 23, 1881. No. 245,991. The object of this invention is to provide a furnace in which the ore will be gradually roasted, being made to travel toward the heat. In connection with this furnace is a peculiarly constructed pulp vat. It would be difficult to intelligently describe the details of this furnace without the aid of engravings.

Our Extra Edition.

This number of the MINING AND SCIENTIFIC PRESS consists of 24 pages, and every page has more or less of interest to the progressive industrial reader. We devote a great deal of space to a very complete description of the cable railroad system which had its birth in this city, and which has fully developed here. We have had a number of engravings prepared for this article which not only fully illustrates the system, but also the various attempts made in that direction before it was perfected. To engineers this illustrated article will be of great value. The tables accompanying it show the details of cost, expenses, etc., with great clearness.

We also give a complete catalogue of the Mechanics' Institute Fair now in progress in this city, and descriptions of many of the prominent exhibits. The usual correspondence, miscellany, etc., is given. Want of space has compelled us to defer publication of several articles which we had intended for this number.

Cable Roads.

(Continued from Page 145).

In 1865, Mr. Beach made some improvements in his chain and in the rails in which it moved; also, in the forked arms for catching the chain. Mr. Beach took out 6 patents on this system.

In 1866 7, Charles F. Harvey, United States, proposed using ropes, with bulbs or ferrules on them, to catch the arm projecting from the car. He drags the rope through an open tube and places hardened rings around them to prevent wear. The rope runs on the surface of the road under the car. He also proposed an elevated railroad with the track supported on the tops of columns—the cars to be drawn by a moving rope, with bulbs or ferrules on them, a long spiral spring intervening, as in Foster and Brown's arrangement, 1859 (Figs. 4 and 5.)

In 1867, Mr. J. A. Fountain proposed a cigar-shaped balloon with machinery and wheels with deep grooves running on wire ropes stretched on supports, the weight of the car being counter-balanced by the buoyancy of the balloon.

In 1869, G. F. Beanregard, United States, proposed some modification in the invention of Foster and Brown's elevated road of 1859, relating to the clamp or grab to catch the overhead traveling rope; and Sutton and Crowell made some improvement in the mode of connecting a rope with knots or protuberances with the car, using a sprocket wheel for this purpose. (Figs. 6, 7.)

In 1869, W. M. Smith, United States, made some improvements in elevated railways, and during this and the following year, several other inventors took out patents in England and the United States for improvements in elevated railways.

In 1870, Walter Hyde invented an elevated railway, using two wire ropes and a bucket, or car suspended by sheeves on the upper one and by means of a drum on the basket worked by the occupants, and around which the lower rope was placed, the car was caused to be propelled along the upper rope. (Fig. 8.)

In 1872, Mr. Abel Thompson, United States, proposed to run a locomotive in a tunnel underground, and to connect it with a car running on a track in the street by means of an arm running up through an opening in the crown of the tunnel. With this exception, all the recent inventions seem to relate to elevated railways, and a great many patents have been granted thereon; and such is the history up to the time that

Andrew S. Hallidie, of San Francisco,

Matured his system of cable roads now in use in this city. His first patent for a grip pulley was granted in 1870, and after that time he took out a great many patents on cable railroads. He matured his system in 1871, but met with no encouragement and considerable obstacles; but in 1872 he interested some friends in the project and they decided to take hold of the matter with him, built an experimental line on Clay street which demonstrated the practicability of his system.

In the construction of this line Mr. Hallidie gave his close and personal attention, and Mr. Wm. Applesheimer, who was then in his employ as draftsman, was continued by him in the service of the Clay St. Hill Railroad Co., which consisted of Messrs. Britton, Davis, Moffit and Hallidie.

But few inventions of any merit are free from attack, and although they may have been but a short time before considered chimerical and impracticable, as soon as their value is proved there are no end of people who are ready to claim the merit of the discovery, or to openly infringe the patent. And it has been so in this case. When Mr. Hallidie first broached the subject of the railway to his friends, it was generally scouted as being impracticable and visionary; and but for the confidence felt in his ability by the three gentlemen afterwards associated with him in the construction of the Clay St. Hill railroad, it is likely that to-day the cable system of street railways would have been still resting in his brain.

For over three years the Clay St. railway continued to run, carefully watched and strengthened by the inventor, and each improvements made in details as were found necessary from time to time; and after it was an admitted success and the experimental stage had been passed, then other parties were willing to step in and try and reap some of the benefits.

The Sutter St. Railway Co., under Mr. Casebolt, was changed from a horse to a cable railroad, in violation of the patent laws, and resisted suit of infringement until the United States court found judgment against them in favor of Mr. Hallidie's patent, after expensive and vexatious litigation.

In like manner the Geary street railway was built under the direction of Mr. Applesheimer, who had left the service of Mr. Hallidie, and the company compromised after the suits against them had been pushed almost to a conclusion, so that after six years of vexatious litigation Mr. Hallidie's patents have been sustained and all the railroads in the city have acknowledged their validity. It will be noticed that although one or two inventors seem to have had an indistinct and indefinite conception of the principle of the cable system of street railway, their minds ran mostly on the elevated system as projected by Brown and Foster in 1859, or the chain running in the rail as constructed by Mr. A. E. Beach in 1864, and the only invention that had any really practical test, was that of Mr. Beach on the old Greenwich Street Elevated Railroad in New York.

Inventors may have conceived the idea of employing an endless traveling rope in an underground tube, connected at will by a gripping apparatus attached to a car on a track in the street; but we have no evidence that such is the fact or that any such idea had ever been put into practice in any part of the world, until Mr. Hallidie conceived his system and constructed the Clay Street hill railroad in this city in the year 1873. We have briefly sketched the history of the invention in connection with street railroading, where chains or ropes have been proposed to be used, and illustrated some of the earlier inventions. We now propose to illustrate the system of Mr. Hallidie as adopted by the different cable companies in this city as also the costs of construction and maintenance so far as we have been able to ascertain the same.

Although the cable railroad was invented mainly to overcome the

Difficulties in Ascending the Heavy Grades

In this city, it has been found by experience that this system is equally applicable to level roads.

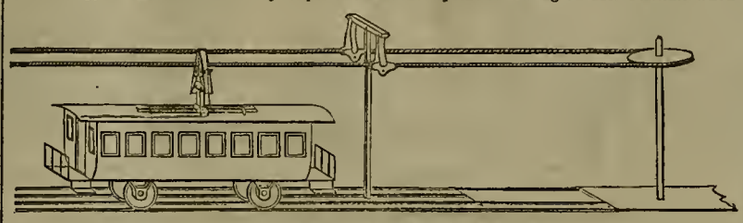


FIG. 1.—FOSTER & BROWN'S STREET RAILWAY, 1859.

As a matter of interest in connection with this invention, it may be remembered that some years ago the cars of the Omnibus Railroad company were hauled up Jackson street, from Kearny to Stockton, by extra horses, and that during the busy portion of the day, three horses, driven tandem, were placed in front of the two horses attached to the car, and that the five had all they could do to haul the cars up two blocks—the ascent being 73 ft. in 875 ft.

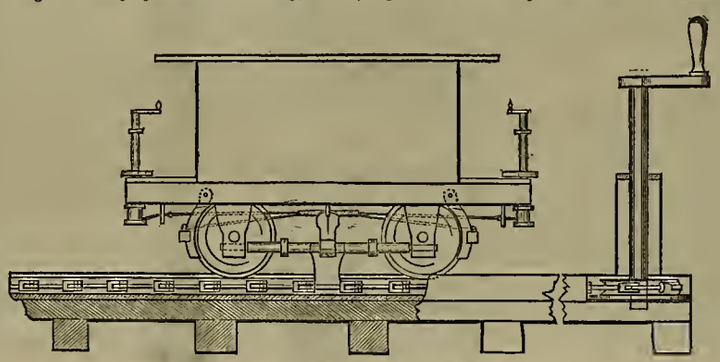


FIG 2.—A. C. BEACH'S STREET RAILWAY, 1864.

It was while watching these cars being hauled up this street, and observing the painful difficulty the horses had in performing their work (two of the horses having fallen were dragged part way down hill), that Mr. Hallidie determined to find some more humane and effective way of performing that service.

He had been engaged in devising a way of

Conveying Material Over Precipitous and Mountainous Roads

By means of endless wire ropes elevated on posts above surface obstructions, snow, etc., and had successfully put in operation a method by which this was done when the descent was as great as 1 in 1½. Those who were in San Francisco and attended the Mechanics' Fair of 1871, may remember seeing the wire tramway exhibited there by Mr. Hallidie—a full-size line, with depressions, curves and elevations, and carrying freight, passengers and children—to the delight of the latter. After perfecting this system, he devoted his attention to the solution of the problem he had in view, suggested to him by the incident above related.

At this time he was, and for two years previous had been President of the Mechanics' Institute, which, together with other public duties, required much of his time and attention, nevertheless he

Applied Himself to the Subject of Street Railroads,

And in 1871 he confidentially laid the plans he had determined on before two of his friends, well-known citizens of San Francisco. He had had California street surveyed some time previous with the intention of running an experimental line up that street from Kearny to Powell street, a distance of 1,353 ft., in which there was a rise of 193 ft., but for obvious reasons was anxious that his project should not be known as yet to the public.

Mr. Sample, of the Sacramento *Record*, who made a point of calling on Mr. Hallidie whenever he came to town, in a friendly conversation with him ascertained in part his plans, in the *Record* of July 8, 1870, in its San Francisco news, stated that Mr. Hallidie proposed to run a street railroad up California street, and had already been granted one patent thereon. Very shortly thereafter, application was made to the Board of Supervisors for a franchise to run a

Street Railroad on Russian Hill,

And one of the most extraordinary franchises ever conceived was, on Aug. 3, 1870, granted to certain parties in San Francisco, covering a small portion of every street on the slope of the hill, from Pine to Pacific, and portions of the streets running at right angles thereto. This

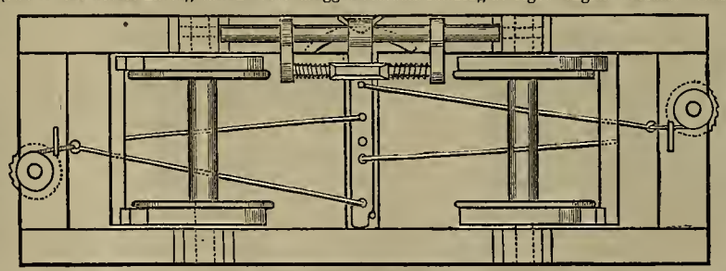


FIG. 3.—A. C. BEACH'S STREET RAILWAY, 1865.

unexpected blockade delayed the progress of Mr. Hallidie's operations, but the owners of the franchise were left to grapple with the problem of how best to get up the hill, which they finally gave up; and Mr. Hallidie had to buy the franchise before he could proceed with his experiments, and early in 1872, having the way clear, Mr. Hallidie, having previously interested Messrs. Joseph Britton and Henry L. Davis in the project, these gentlemen were joined by Mr. James Moffitt, and a company was organized to enable Mr. Hallidie to put his project into practice. The public was invited to take stock, but no stock did they take. The owners of property on the hill promised substantial aid if the scheme was carried out; but they likewise took no stock in the scheme, but preferred to make a present of a certain sum outright. Thus the four gentlemen before mentioned undertook the task of carrying into effect Mr. Hallidie's ideas—having faith in those ideas and in him, they told Mr. Hallidie to go ahead, and they would take an equal risk with him in the venture.

FIG. 4.—C. T. HARVEY'S STREET RAILWAY, 1866.

Accordingly it was determined to

Construct the Line on Clay Street,

And in June, 1873, ground was broken and the work of construction began under Mr. Hallidie's immediate supervision; and on the first day of August a trial trip was made about 4 o'clock in the morning—the terms in the franchise required the cars to be run by that day. It was a gray morning and the fogs were hanging around on the hills; the ground being slippery from the moisture. The engine was started, and the rope which was 7,000 ft. long moved through its long tube under the surface of the street quietly and satisfactorily. The dummy containing the gripper was brought to the brow of the hill looking over the bay, and the grip lowered into the tube containing the moving rope. Long ropes were attached to the frame of the dummy which was lowered a few feet over the brow of the hill, to see if it could be stopped on the steep incline in the event of the grip losing its hold on the cable. The brakes were found to be inadequate to the requirements, and the prospects of plunging down Clay-street hill improved in consequence. The hill looked very steep that morning, and there was no wagon in the street to run into, and no person visible who could be run over, and through the misty morning the foot of the hill seemed to rest in the waters of the bay. A consultation was held, and it was determined that

The Trial Had to be Made,

And the man detailed to take the dummy down the hill turned pale and succumbed to the prospect of possible disaster. Seeing the man's fear, Mr. Hallidie took charge of the dummy,

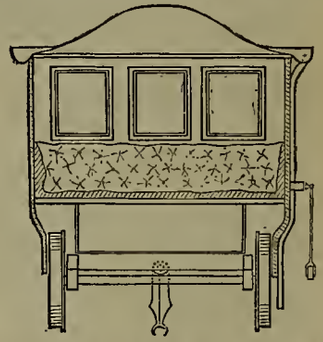


Fig. 5.—C. T. Harvey's Street Railway, 1866

and fastening the grip upon the rope in the tube, went over the brow of the hill, and with Messrs. Britton and Davis, and six of the employees, reached the bottom of the hill in safety, having tried the grip in several ways on the way down, stopping at the crossings, starting up, pushing the dummy against the direction of the moving cable, dropping the cable, picking it up again, and so forth. At the bottom of the hill the dummy was reversed and the grip again made fast to the cable, and away the car went up the steep hill. By this time some of the residents had been aroused from their sleep, and one man appearing at the window in a red night cap enthusiastically cheered and threw to the company on the dummy a bunch of flowers. At length the top of the hill was reached, and the company broke into cheers and expressed a strong confidence in the success of the invention.

The tube at this time terminated at Jones street—the time allowed having been so brief, it was found impossible to complete it to the engine house, situated at Leavenworth street, before the expiration of the time required by the franchise, and it was decided, in order to fully comply with the terms thereof, to

Make a Public Trial

In the afternoon with a car attached; and about 3 o'clock this was done. The trip down was made all right and without interruption; but the crowd was so enormous that the workmen could not do their duty, nor could the police keep the crowd back. Everybody seemed pleased at the success and were over-anxious to help; consequently, in turning the dummy it was turned with such a will that the grip was disarranged, and the workmen had to be sent into the pit, under the surface of the street, to replace some of the disturbed parts. This necessarily took some twenty minutes, and during this time the crowd increased in volume and excitement, making all kinds of remarks, but generally deploring what they believed to be the failure of the experiment, as the car and dummy did not start as soon as they expected.

It was the intention to take the car up empty and to permit three or four of the public to stand on the dummy; but the desire of the people to ride was so great that the doors were forced open and the car was crowded far beyond its capacity. In like manner people clung on the dummy, so that about 60 persons managed to get a free ride at their own risk; and when she started and moved about 20 ft., cheer after cheer rang through the air, and the surging crowd ran up Clay street, keeping pace as

well ae it could with the progress of the car.

About Half Way up the Hill

There is a sudden change of grade, and the accent increasee to 1 in 6. Here the car and dummy wavered and finally etopped on the steep hill. The people tumbled out, and determined that they should not stop there, gave the car a push and eet it moving up the hill. Meanwhile Mr. Hallidie suspected what the trouble was, jumped into a wagon which Frank Edwards had there, and running into the engine room, found that the rope, being freshly tarred, was slipping in the groove of the grip pulley, which sets the rope in motion. The application of a little lime and saw-dust and some preesure on the rope set it running again, and shortly the increasing speed of the engine told him that the public trial trip had been made, and the car and dummy were once more on top of the hill, and the thing was pronounced a success.

Like all new inventions, there were still a great many changes and alterations to be made before all the difficulties could be overcome, but Mr. Hallidie and his friends were encouraged to continue the patient and persistent efforts, which have finally resulted in making the San Francisco cable railways so celebrated, by the certainty which they then felt that complete success would ultimately crown their endeavors.

That portion of the city of San Francisco through which

Clay Street Runs is Exceedingly Hilly.

And the cable road built thereon commences at the foot of the hill, on Kearny street, at the Plaza, near the old City Hall, and follows Clay street for a distance of one mile, passing over the brow of the hill at an elevation of 307 ft. above the starting point, and distant 2,800 ft. from it. The contour of the route is shown in the accompanying drawing, Fig. 9, and it will be observed that the street is cut up by 10 cross streets, at the intersection of which the ground is nearly level, while in each side the grades vary from 1 in 28 to 1 in 6½. Clay street is only 49 ft. wide from house to house, and closely built up. This site for the experimental line was chosen because it reached the highest point of Russian hill, and presented all the difficulties which were likely to be encountered in any other street. On account of the steepness of the street, property on the hill was almost inaccessible, and numerous projects had been suggested to reach it by zigzagging up the hill by routes which would be not only very tedious and slow but very expensive.

If the city had been laid out with respect to its topography, the hillsides terraced, etc., while there probably would have been no cable road invented, the city itself would have been much more picturesque with its hills than it is now, and certainly the hill residences more accessible for carriages drawn by horse flesh.

As it is, poetry and beauty have succumbed to the practical and ugly—modified only by the fact of the existance of this new way of reaching your residences by a wire rope railway.

The simplicity, regularity and

Smoothness of the Working

Of the cable road, are as much to be admired, as the ingenuity and perseverence that overcame the many difficulties which had to be surmounted, and which we can appreciate only when we examine into the considerations and conditions connected with the first experiment, and it must be borne in mind that although inventors, as already indicated, had for many years previous given a great deal of attention to metropolitan passenger traffic, and many experiments had been tried on other systems and their methods, nowhere had this system been tried and in no portion of the civilized globe had it been reduced to practice, before being tried in the city of San Francisco, by Mr. Hallidie and his associates.

Considerations Involved.

Various considerations and conditions had to be carefully weighed before venturing upon a project which involved not only the expenditure of a large sum of money, but the comfort of the citizens and the safety of human lives.

The ordinary traffic by wagons and carriages on the street could not be interfered with, and the surface of the street was required to be left in the same condition as heretofore, with no obstructions or impediments to travel or traffic.

No posts or poles would be permitted in the streets; nor would the authorities allow any locomotive or exposed motor, that might frighten the horses or possibly explode. It was required also that the cars should be under control, so that it could be stopped and started at any point on the route as quickly as with horses. The speed, too, was limited to not less than three miles and not more than eight miles per hour, and the fare for a single passenger should not exceed five cents for the entire distance.

To meet these requirements,

Many Difficulties Presented Themselves

The street was of an uneven grade, and if a rope was employed it must be confined above as well as below, otherwise it would fly up in the air several feet above the street surface at the crossings where the road changed suddenly from a level to a rise of 1 in 6½, and if kept down, a roller or pulley had to be provided on top of the rope inside the tube, and this would be in the way of anything passing down from the car body to the rope. Another consideration was that the climate of San Francisco has long and heavy rains from October to April, and if a rope was used in a tube underground, the opening on the top of the tube should be placed sufficiently on one side of the rope, so that the grit and sand carried by the rain would not fall on the traveling rope, and any opening in the tube must be too small to permit the narrowest wheel to fall therein.

Another difficulty found was in the grooved sheeves, around which the rope would have to be wound a number of times. The unequal wearing of these grooves would strain the

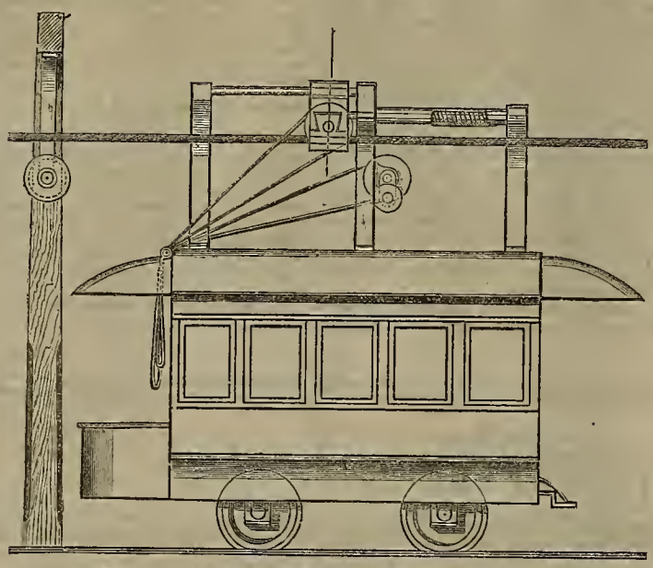


FIG. 6.—G. F. BEAUREGARD'S STREET RAILWAY, 1869.

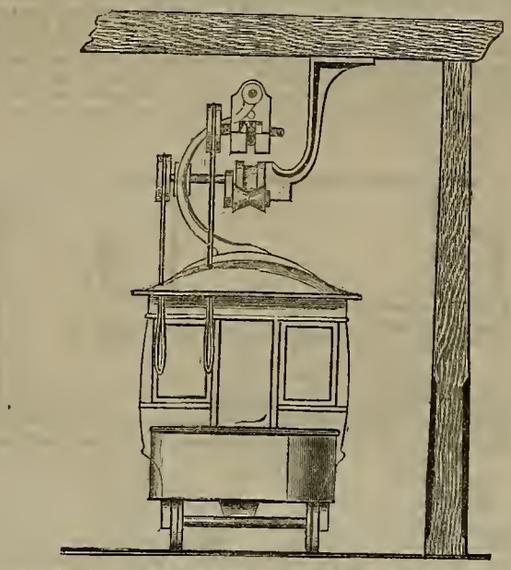


FIG. 7.—G. F. BEAUREGARD'S STREET RAILWAY, 1869.

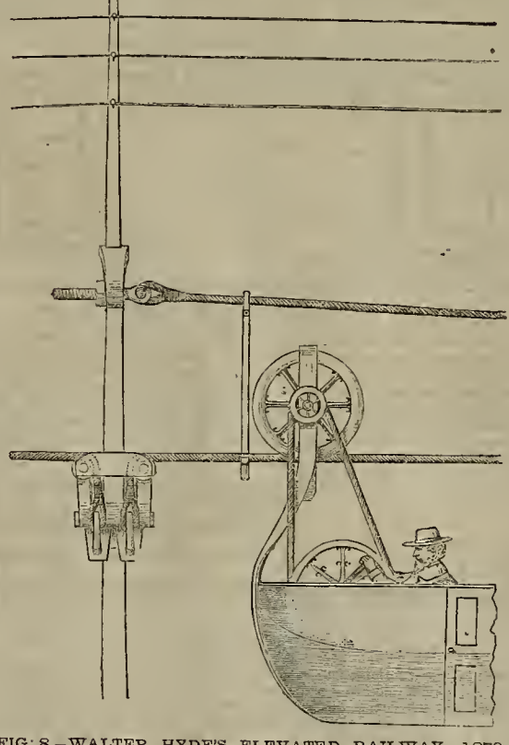


FIG. 8.—WALTER HYDE'S ELEVATED RAILWAY. 1870.

Transmission of Power

From the engine to the rope. By the ordinary way there would be required two deeply-grooved sheeves, around which the rope would have to be wound a number of times. The unequal wearing of these grooves would strain the rope and rapidly wear it by attrition. Many other minor considerations, which in the aggregate were quite considerable, have been explained to us by the inventor from time to time, as we have made our inquiries, but will not, perhaps, interest the reader, as they have all been overcome and the system brought to a high standard of perfection. The manner of overcoming these difficulties will be more readily understood from the following description of the Clay-street-hill railway, the first cable railway constructed:

The Surface of the Streets

Through which the cable road runs has the same appearance as with a horse-car line, except that between each track there is an opening running the entire length of the road, about ¾ of an inch in width. Below the surface of each track there is a channel or tube about 20 inches deep by 14 wide, and large enough to contain pulleys and rope and a gripper. The tube is opened at the top, as above stated, by the long slit ¾-inch wide.

The purpose of this tube is to protect a steel wire-rope which moves inside and the pulley which supports the rope, as well as the working parts of a gripper which connects the rope with the car on the track on the street, the shank of which passes up through the long slit before mentioned.

The Rope Inside the Tubes

Or channels runs the entire length thereof, up under one track and down under the other, and passes into the engine room. It there takes turns around a driving pulley of peculiar construction, motion being given to the driving pulley by means of a steam engine and thence imparted to the rope. At each end of the cable road, *i. e.*, at each terminus, the rope passes from one tube to another, half around a large horizontal sheeve affixed to a carriage supported on a track, and which moves accordingly as the rope becomes tight or slack, keeping an uniform and constant tension on it.

In the accompanying engraving, Fig. 10 shows the

Tube or Channel of one Track

Of a cable railroad, and it will be seen how the road is constructed, with the tube containing the wire rope and sheeve, and also, the grip in the tube and shank of the grip passing through the slot into the tube, a portion of the casing being removed for the purpose of exposing the same, the mode of connecting the ties to the yokes or standards and the stringers of the track will likewise be readily understood; in the illustration a portion of the surface of the road is removed, but the general appearance of the street will be seen by reference to the engraving and the reproduced photographic views further on.

It was necessary that the rails and the slot in the tube should be exactly parallel, hence the ties and sleepers were bolted to yoke castings which were placed four feet apart on the steep street and three feet distance where the traffic was the heaviest, and the space for the shank of the gripper in the slot being restricted (the slot seven-eighth inch wide, shank five-eighth inch thick), the track had to be carefully laid and the play between the flange of the wheels and the rails reduced to the minimum.

The Gripper

Constituted an important element in the success of the road, as also did the method by which it should be supported, and its position in relation to the passenger car. The objections to placing the gripper in the car were, that it would occupy valuable passenger-room, and it would destroy the symmetry of the car; cutting it in two, as it were. The look-out of the men in charge would be interfered with in an enclosed car, and if the car was continued beyond the termination of the cable, an unnecessary dead weight must be carried with it, unless the gripper was removed which would create delay and annoy the passengers. A carriage was contrived to carry the grip, and to be so connected with the passenger car that it could be easily uncoupled when necessary. The carriage was called a dummy, and the men in charge of the grippers became dummy-men—although only men of quick perception and intelligence were employed in this capacity. This dummy was a very different looking machine when first constructed to the present one, and for a year or two much trouble was experienced in making the dummy perform its work in a satisfactory manner. It was originally an untrained steed; jumping the track, kicking up behind and before and up to all kinds of antics, but by dint of experimenting it has been brought down to work, which it now does in a very satisfactory manner. At first it had no seats, but it is now constructed in manner shown in illustration No. 11.

Fig. 11 is a

Section Through the Dummy and the Road Bed,

And the position of the grip on the dummy and in the tube is shown. It will be observed that the slot or opening of the tube is not in the center between the rails, but is set off on one side of the rope and sheeve in the tube. There are two reasons for this. The water, dirt and sand which falls into the tube through the slot will not drop on the rope, and the grip can be so constructed as to have a heel or offset, which enables it to pass by the pulley placed in the top of the tube to keep the rope from rubbing against the crown of the tube or flying up in the air.

The grip employed on the Clay street road differs from most of the other grips in its mode of construction, although the same mechanical principles are involved. It is extremely compact and powerful, and can be entirely discon-

nected from the rope at any point on the road, and is able, also, to pick up and grip the rope at any point.

The General Arrangement of the Grip

Can be seen in the illustration, Fig. 11, and in detail in Figs. 12 and 13. It is fixed to the dummy by the slides through which the shank moves, and by the four prongs attached to the square nut through which the large screw works. The large screw is hollow, and is used for the purpose of raising and lowering the grip by means of the lower hand-wheel to its proper level, so that it will not strike anything inside the tube when in motion. The upper hand-wheel works on a screw cut on the end of a rod which passes down through the hollow screw, and is connected to a slide working in the shank of the grip so that, according to the way the upper hand-wheel is turned, the slide is raised or lowered. At the lower end of the slide is a wedge-shaped block, having the thick edge down, and two frames which slide on the heel of the shank are moved in a horizontal direction by the wedge. Attached to these sliding frames are jaws which grip the rope and small wheels which hold the rope in position and guide it between the jaws. These guide wheels have rubber springs behind them which keep them pressed forward a little in advance of the jaws, and after the sliding frames and jaws are opened by lowering the wedge by means of the upper hand-wheel, the grip is lowered over the rope by means of the lower hand-wheel working on the big screw, and the rope is seized by closing the sliding frames which brings the guide pulleys on each side of the rope, and the moving rope runs freely between the guide wheels and the jaws, but it is not in contact with the latter. By turning the lower hand-wheel, the grip is raised to its proper level so as to clear the lower pulleys and other obstructions, and when it is desired to grip the rope an extra turn is given to the upper hand-wheel, which raises the wedge still higher, bringing the jaws in contact with the rope and forcing the guide wheels back on their springs. When the grip and the dummy to which it is attached moves with the rope with the same velocity, but this momentum is acquired quite gradually, for as the guide wheels are tightened on the rope, the dummy gradually acquires the momentum of the rope until the gripping jaws securely hold the rope.

All this is performed with great ease and rapidity by the man in charge

From the Floor of the Dummy,

And the grip can be controlled easily by a boy. Another use to which the heel of the grip is put is for braking the dummy on a steep incline in case of necessity, and for which purpose it is brought up in contact with the square shoulder of a lateral timber immediately above it and which forms part of the crown of the tube. This is only used in case of emergency, as the other brakes are sufficient for all purposes. When the

Grade of the Road Changes Suddenly Upwards,

Pulleys have to be used, as before stated, to keep the rope down. These are necessarily of small diameter, and are situated as represented in Fig. 14, which is a side section of the tube, showing the upper and lower pulleys, rope-gripping attachment, and the dummy with passenger car attached.

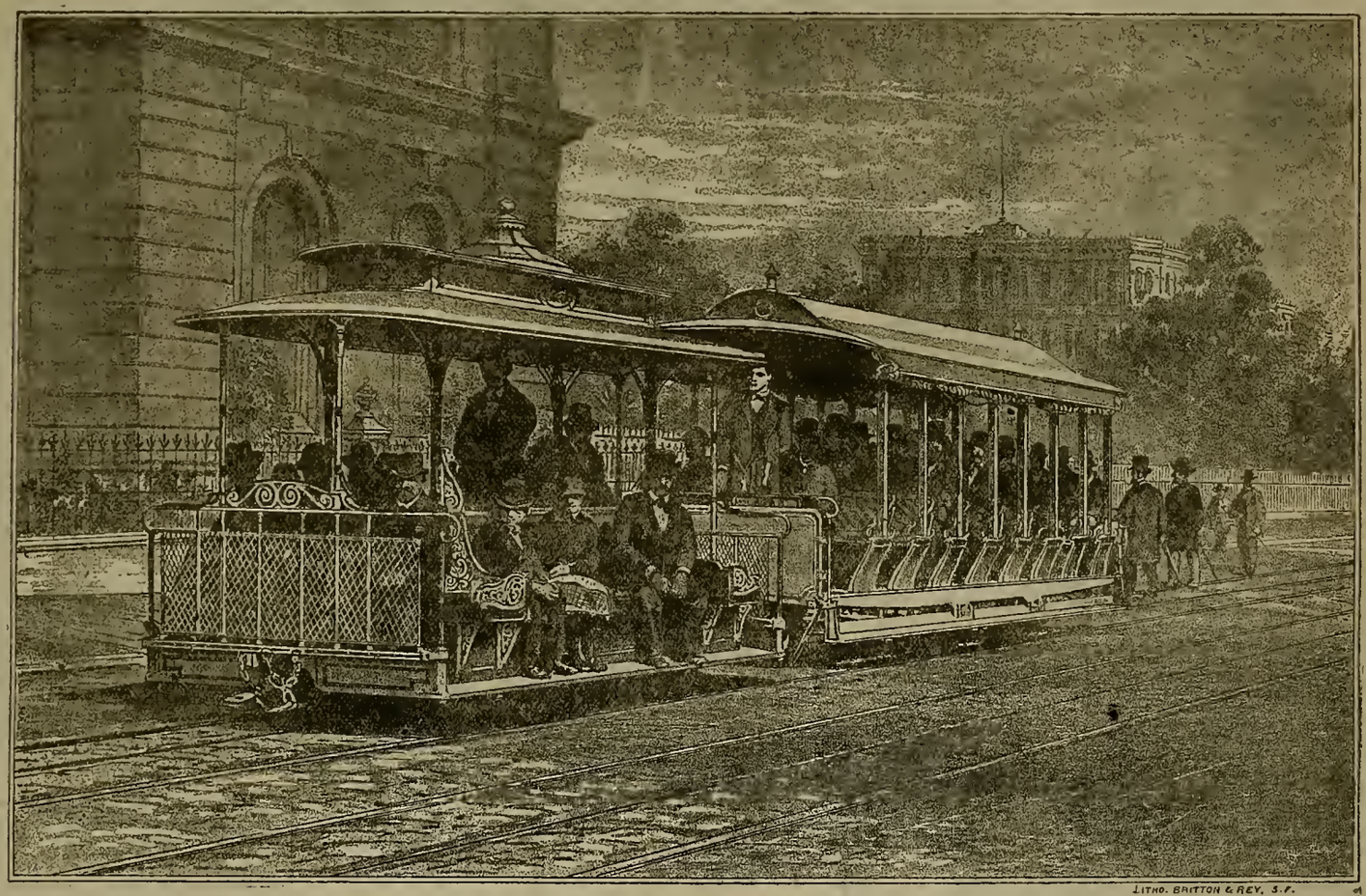
It will be noticed that the passenger car is provided with additional brakes to the ordinary wheel brakes, and which consist of a shoe on each side of the car between the wheels, and bearing directly on the rails. These brakes are worked by a screw and are sufficiently powerful to lift the empty car easily from the track. A drag pole is also used in going up hill. Neither of these contrivances are, however, necessary on a level or comparatively level road.

The large wheel which sets the rope in motion is quite simple in its construction, but exceedingly ingenious. It consists of a series of jaws hinged together in the middle and having spurs which rest on the circumference of the wheel. When the rope presses on the jaws, they grip the rope, and as soon as the pressure of the rope is removed, they open automatically and release it. By referring to Figs. 15, 16 and 17, its mode of construction will be seen.

Obviously, one of the most important items of expense in the running of a road of this character, is the

Wear and Tear of the Steel Wire Rope

Used in hauling the cars, and one of the great drawbacks to the successful working of the system, would be the mutilation or breaking of the rope during the hours of business and the detention of travel caused thereby; hence, the most careful consideration had to be given to the life of the rope—to the immediate detection of any weakness, and to its immediate repair—consequently, all the sheaves and rope pulleys employed are of as large a diameter as possible. The rope is made to lead in a true line into the grooves thereof. As few turns as



LITHO. BRITTON & REY. S.F.

FIG. 19—GEARY STREET CABLE ROAD—GRADE NEARLY LEVEL.

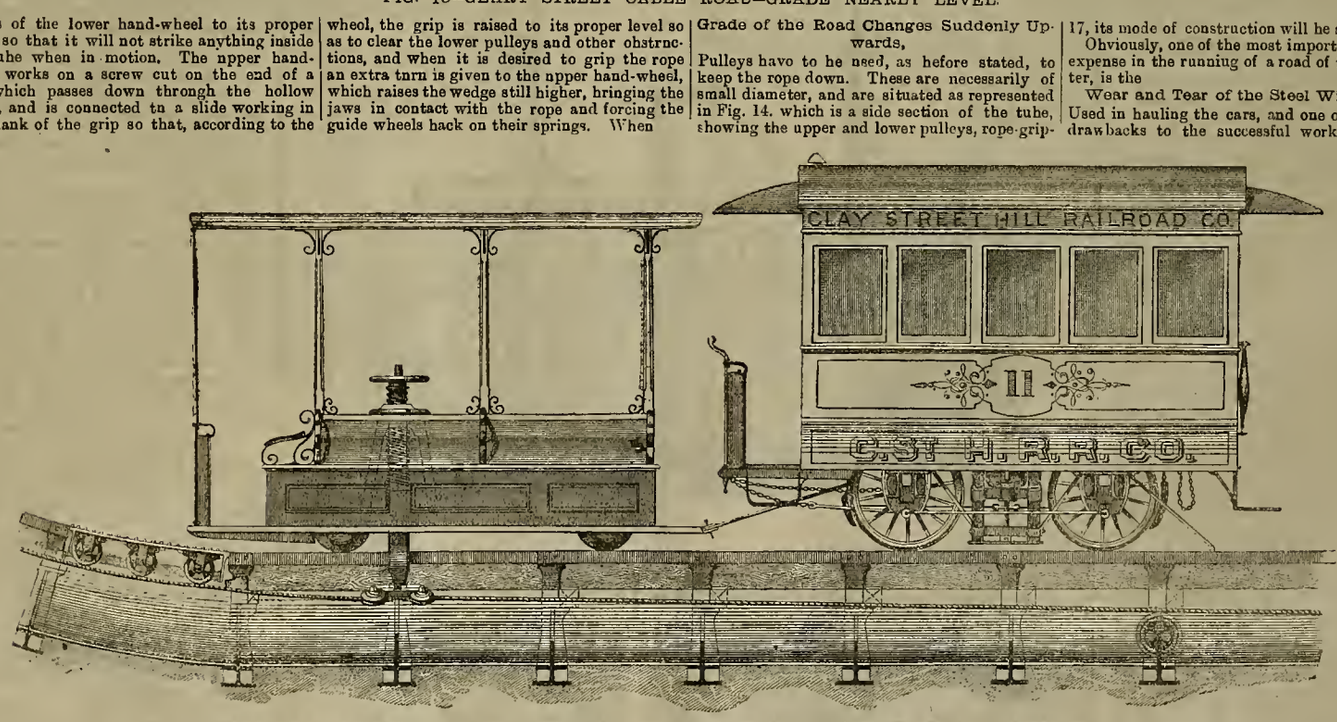
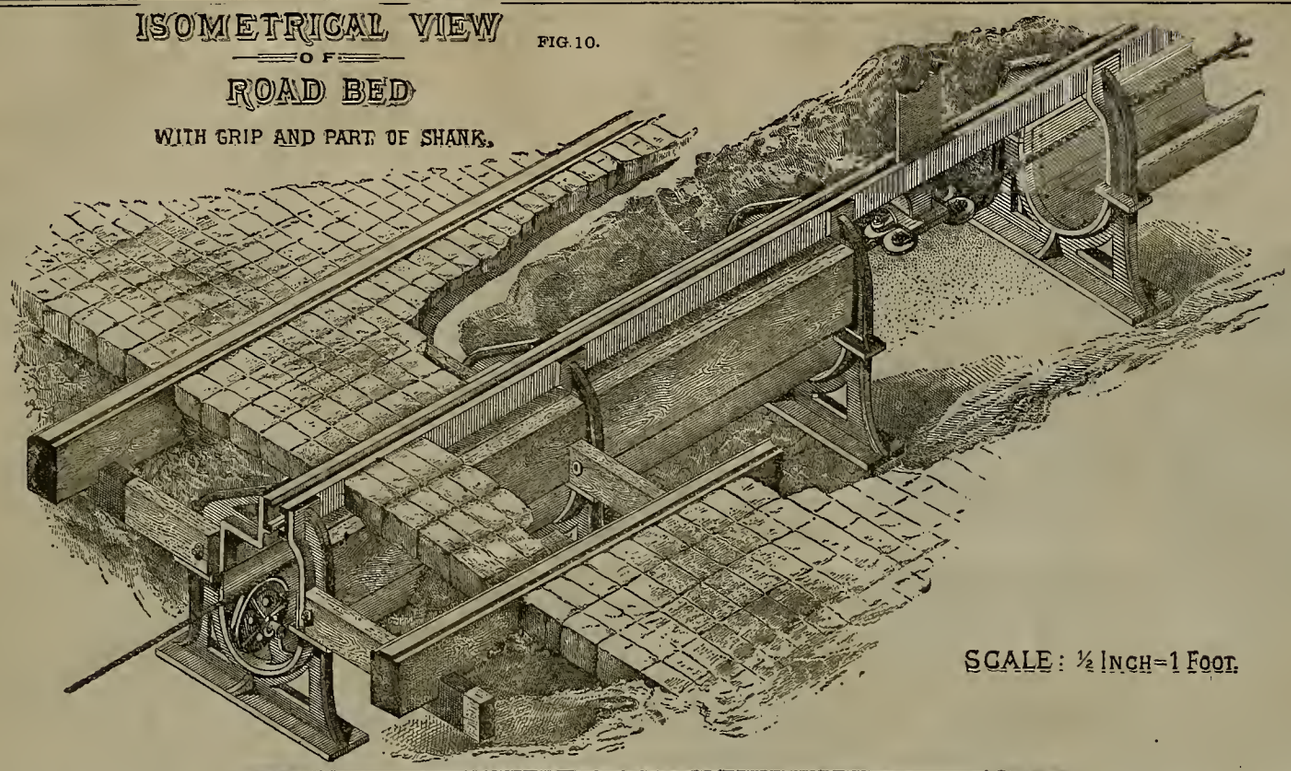


FIG. 14.—PASSENGER CAR AND DUMMY WITH GRIPPING ATTACHMENT, WIRE ROPE AND SIDE SECTION OF TUBE.

ISOMETRICAL VIEW
OF
ROAD BED
WITH GRIP AND PART OF SHANK.

FIG. 10.



SCALE: ½ INCH=1 FOOT.

possible are given to the rope. The rope is conducted in full view of the man in charge of the engine, so that he can detect anything unusual in its appearance. Tell-tales are fixed at point where the rope enters the engine-room, which automatically sounds an alarm in case a broken strand should exist. And in addition to these, an adjustable covering bar is placed over the slot which can be easily removed, and thus allow the rope to be taken up from the tube through the slot and immediately repaired at any point on the line of the road.

Engine-Room, Etc.

The engine-room, offices and car-house are located near the summit of the hill, 3,300 ft. from the eastern terminus and 307 ft. above it. The engine-room, Figs. 18 and 19, which is situated in the basement of the building, 15 ft. below the sidewalk of the street. The building itself is 68x68 ft., and is situated on the corner of the street, light and ventilation being received from the north and east sides.

Steam is supplied by two boilers 16 ft. by 54 inches, with 46 3¼-inch tubes, and the furnaces are supplied with Morton's smoke-consuming fire doors. The smoke-stack is carried up 80 ft.

There are two horizontal engines 14x28 inches, made by the Delamater company, and furnished with the Ryder cut-off. The piston speed of the engines is 532 ft. per minute, and that of the rope six miles per hour. The diameter of the driving-grip pulley is 8 ft., as also is the diameter of the angle sheaves by which the rope is lead from the engine house to the tubes in the street, the rope making a right angle to the right and left after leaving the engine house.

In the engine house there is provided a takeup arrangement for the rope, by means of which the stretching of the rope can be taken up. This is a long wrought-iron bed, 60 ft. in length, running from the grip pulley frame toward the angle sheaves, and on which is placed a rope sheave, 8 ft. in diameter, with shaft and boxes—the latter arranged to be moved back from the grip pulley whenever the rope is stretched sufficiently to require it.

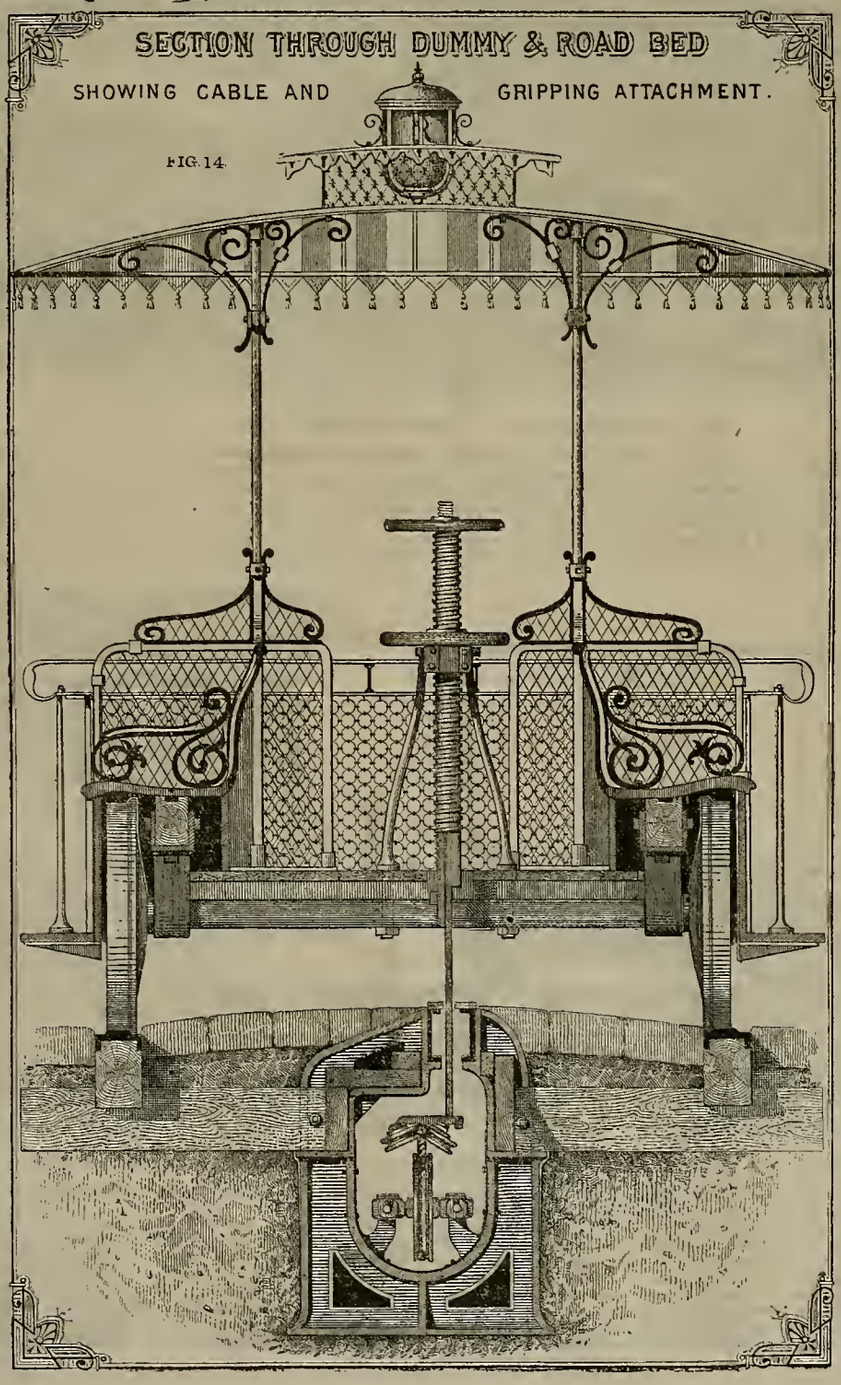
The rope, after entering the engine house, passes half around the double-grip pulley, thence half around the 8 ft.-rope-sheave of the "take-up" back to the grip pulley and half around it, thence out of the engine house over the angle sheaves down the tube. By this arrangement, if the "take-up" sheave is set back 50 ft. on the bed, 100 ft. of rope can be taken up; and as the rope used on this road is 11,000 ft. long, in one piece, it will stretch, before being too much weakened for further use, more than 1%.

The Wire Rope

Is made from crucible steel wire, and has 6 strands of 19 wires each. Each wire is .062 inch diameter, has a tensile strength of 160,000 pounds per square inch area, and capable of bending over its own part with a round turn, straightening out, and repeat at the same spot, without fracture. The average

SECTION THROUGH DUMMY & ROAD BED
SHOWING CABLE AND GRIPPING ATTACHMENT.

FIG. 14.



life of the ropes have been 20 months each.

The passenger cars seat 14 passengers, and the weight of the car is 2,800 pounds. It is provided with the ordinary brakes applied to the wheels, and has in addition thereto a brake placed between each pair of wheels, which presses vertically on the rails. This brake is 28 inches long, and is worked by a screw from the platform of the car in the usual manner, and is sufficiently powerful to lift the car when empty off the track.

The car which carries the gripper or

"Dummy,"

As it is called, is now fitted up with seats, and can accommodate 18 passengers. All equipped it weighs 2 200 lbs. It is supplied with brakes on the wheels, worked by a lever, and these are sufficient for light grades. In addition to these are additional brakes, worked by the foot acting on a wheel attached to a right and left hand screw, which actuates nuts that spread apart levers having at their feet shoes which press at an angle of 45° inward on the rail. This is a very effective and powerful brake.

The grip itself, under certain contingencies, is used as a brake, the heel being brought up against the smooth surface at the top of the tube by means of the hand-wheel acting on the large hollow screw.

The form of grip used by the California and Sutter street railroad is on the plan shown in Fig. 18. This is operated by the lever, which cause the jaws which grip the rope to open and close with a vertical motion. The mode of catching the rope is as follows: The jaws are opened to the fullest extent; and the dummy with its gripper is switched on to the rope sideways, and the jaws are closed over the rope by the movement of the lever. Until the jaws grip the rope positively, the rope runs freely over the guide pulleys attached to the frame holding the jaws.

The grip used on Clay street railroad is able to pick up the rope on any part of the road, but the grip shown in Fig. 20 can only catch the rope at points on the road that are provided with suitable sidings.

By referring to the illustrations of the Clay, Sutter, California and Geary-street roads (Nos. 19 and 20, respectively), the general appearance of the dummies and cars will be understood.

With the exception of the Presidio railroad in San Francisco, and the Roslyn tramway in Dunedin, New Zealand, all the cable roads so far constructed are straight lines.

The Presidio railway, now in course of construction, has one angle of 45°, at the intersection of Montgomery avenue and Union street, and the turn is made by deflecting the rope by means of two horizontal rope sheaves 8 ft. in diameter.

Both Union street and Montgomery avenue descend toward the curve, and before reaching the point where the rope is tangent to the curve, the moving rope is released from the grip, and the dummy and car proceed by gravitation to pick up the rope again by the grip.

The Roslyn tramway has a curve on an incline of one inch. In this case the grip cannot be released from the ascending rope. And there is a series of horizontal sheaves, placed 8 ft. apart, inside the tube, and parallel to the track the curve. This arrangement of roller and guide bar is provided to prevent the shank of the grip being bent, which might otherwise occur from the side strain of the hauling rope.

The amount of coal consumed on the Clay-

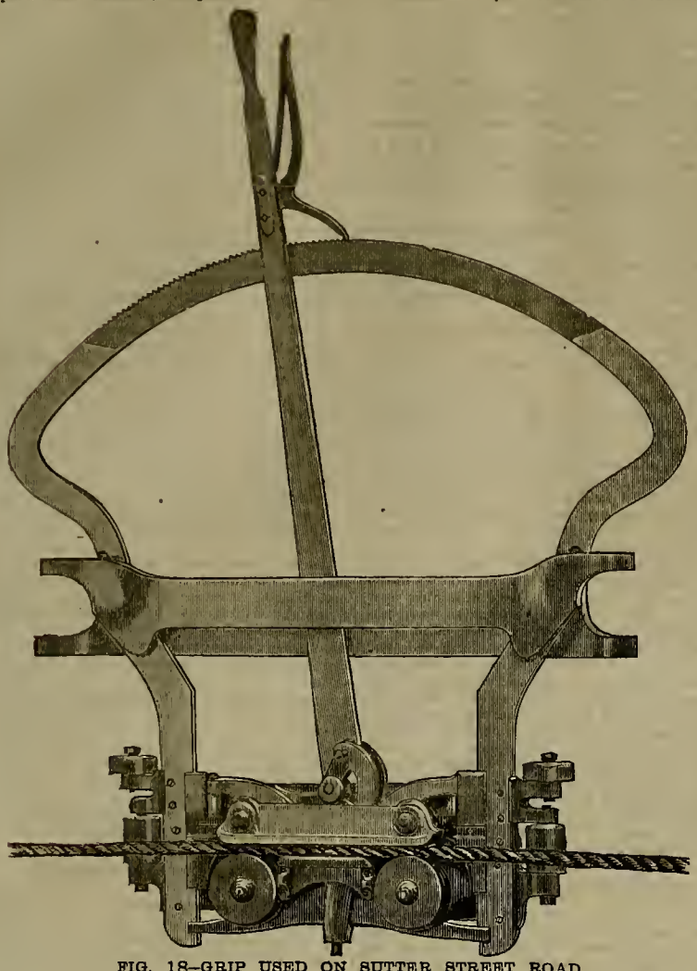


FIG. 18—GRIP USED ON SUTTER STREET ROAD.

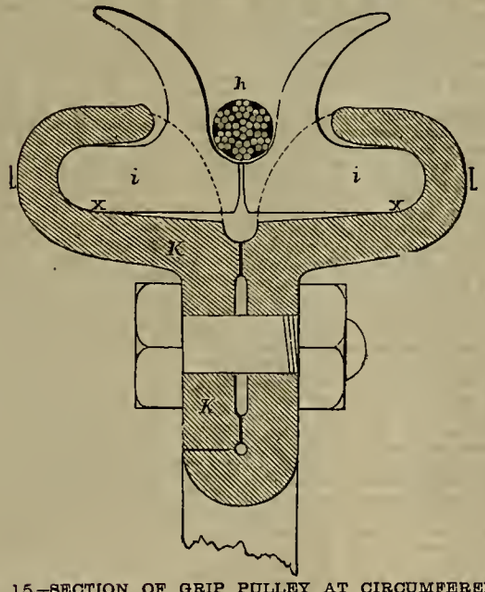


FIG. 15.—SECTION OF GRIP PULLEY AT CIRCUMFERENCE.

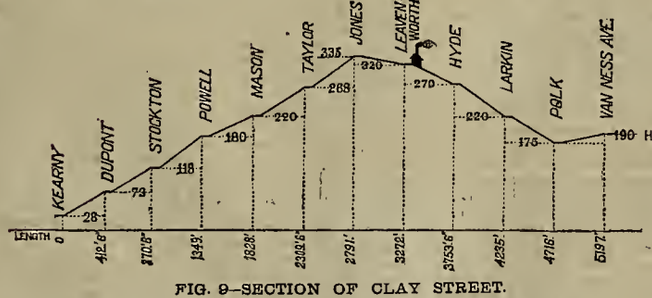


FIG. 9—SECTION OF CLAY STREET.

and slot, around which the rope passes. Immediately over these sheaves and somewhat in front of them, is a guide bar, curved exactly parallel to the slot of the tube. On the shank of the gripper there is a roller so placed that it rests against the guide bar in passing around

street railroad, Wallsend Sydney, is 3,600 lbs. per day of 17 hours, and 4,000 fares are taken daily; thus, each passenger requires 9-10 lbs. of coal to carry him on his journey, which, at $8 per ton, would be 3-10c per passenger.

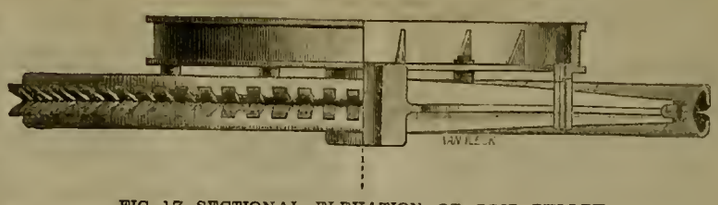
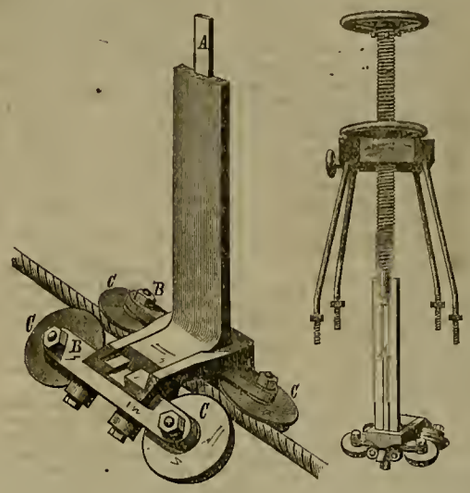


FIG. 17—SECTIONAL ELEVATION OF GRIP PULLEY.



FIGS. 12 & 13.—THE CLAY STREET GRIP.

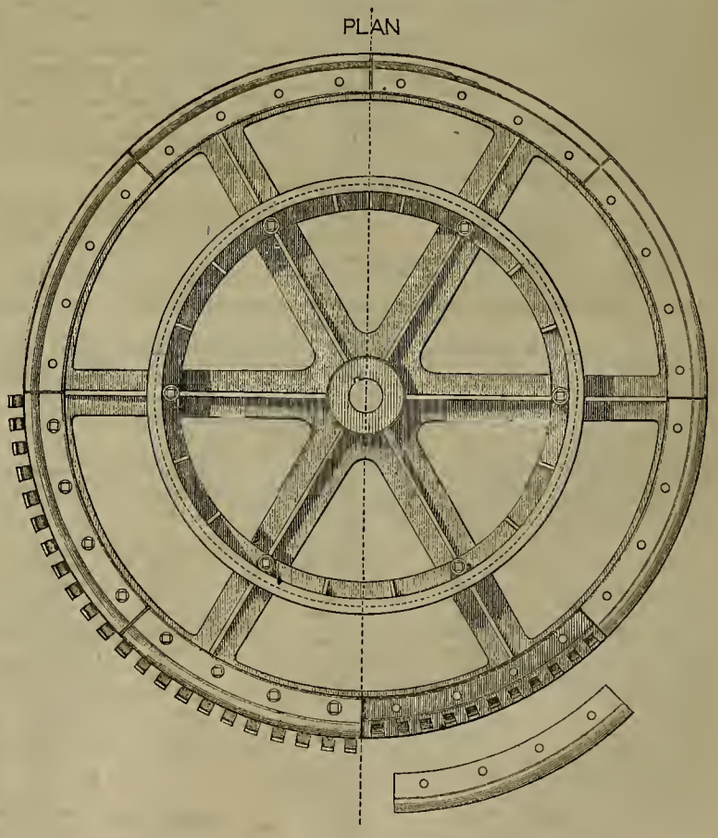


FIG. 16—GRIP PULLEY.

TABLE A.

Cost of Construction.

The following table shows the estimated

COST OF CONSTRUCTION AND EQUIPPING THREE MILES OF HALLIDIE'S CABLE RAILWAY, DOUBLE TRACK.

Excavating trenches for tubes placing and fitting tube and track, refilling and paving street	$ 6,600 00
2,700 cast iron yokes, 150 lbs. each, 405,000 lbs., @ 3c	12,150 00
264 11" dia. rope bearing sheaves and spindles, @ $2	528 00
20 man-hole castings, complete, @ $20	400 00
Sheet iron for casing tube, 111,000 lbs., @ 3½c.	3,885 00
Channel iron for slot, punched and drilled, 211,-200 lbs., @ 4½c per lb	9,504 00
Adjustable slot irons, 2×½, 71,172 lbs., @ 3½c	2,491 04
Timber, stringers, ties and housing for tubes	3,194 00
Tram rails, 40 lbs. per yard, 130 tons, @ $60	7,800 00
Fish plates, 5.984 lbs., @ 4c	239 36
Timber dogs, $171; spikes, $72	243 00
Machine bolts, 16,464 lbs., @ 0½c	1,070 10
Cost of 1 mile double track road-bed, complete	$ 48,104 56
Add 2 miles 3" flexible steel wire rops, 16,500 lbs., @ 23c	8,795 00
Total cost of one mile double track	$ 51,899 56
Cost of 3 miles double track	$51,899 50×3=$155,698 68
2 horizontal engines, 14"×30", set up	5,800 00
2 boilers, 52"×16 ft., set up	4,500 00
Tank, pump and heater	1,500 00
Compensating arrangement at end of line	1,800 00
Driving machinery, pulley, etc.	0,500 00
15 cars, @ $900	13,500 00
15 dummies, fitted with grips, @ $700	10,500 00
	44,100 00
Building site, say	$10,000 00
Buildings, say	10,000 00
	20,000 00
Engineering sundries, 10%	21,979 87
Total cost of 3 miles, complete	$241,778 55

To the foregoing must be added royalties and any extraordinary expenses of which we may not be aware.

TABLE B.

The foregoing estimate is based upon the following

PRICES PAID IN SAN FRANCISCO FOR LABOR AND MATERIAL:

Machinists	$ 3 00	per day
Bricklayers	3 00	per day
Blasters	2 50	per day
Blacksmiths	3 00	per day
Lathe and machine shop	60	per hour
Cast iron	3	per pound
Bar iron	3	per pound
Sheet iron, number 14, plain	3½	per pound
Sheet iron, galvanized	4½	per pound
Lumber, 1000 feet, B. M	18 00	
Nails, per keg, 50 pounds	4 50	
Carpenters	3 00	per day
Hod-carriers	2 00	per day
Laborers	1 50	per day
Laborers' foreman	2 50	per day
Blacksmith and forge	1 25	per hour
Bricks	10 00	per 1000
Lime	2 25	per barrel
Cement	4 00	per 300 lbs
Rails, iron	60 00	per ton
Wrought iron work, average	8	per pound
Coal	8 50	per ton

Under tables C and D are attached an estimate of the comparative running expenses of a horse railway and a cable railway working under the same headway—that is, the cars on either line leaving at the same distance of time apart—every 2½ minutes. The horse road speed being 4½ miles per hour; that of the cable road being six miles per hour; but it must be borne in mind thot the *carrying capacity on the wire rope road is double that of the horse road.*

TABLE C.

AVERAGE RUNNING EXPENSE OF A HORSE RAILWAY THREE MILES, DOUBLE TRACK, SPEED 4½ MILES PER HOUR, 32 CARS, HEADWAY 2½ MINUTES.

Stable expenses and feed for 288 horses @ $180 per annum		$51,840.00
Shoeing 288 horses @ $24 per annum		6,912.00
Maintaining harness, 288 horses @ $7.50 per set,		1,080.00
Maintaining horses, 288 @ $125 each, life 3 years, 36,000÷3		12,000.00
Maintaining 32 cars @ $180 per annum		5,760.00
Wages of drivers, 32 @ $2 25 per day, $821.25 per annum		26,280.00
Wages of conductor, 32 @ $2.50 per day, $912.50 per annum		29,200.00
Interest on cost of cars, 32, @ $900, $28,000 @ 6%		1,728 00
Interest on cost of horses, 288, @ $125, 36,000 @ 6%		2,160.00
Interest on roadbed, $32.000, @ 6%		1,920.00
Running expenses per annum, exclusive of administration of office		$138,880.00

TABLE D,

ANNUAL RUNNING EXPENSES OF CABLE RAILWAY 3 MILES, DOUBLE TRACK, SPEED 6 MILES PER HOUR, 24 CARS AND 24 DUMMIES, LEAVING EVERY 2½ MINUTES.

Coal screenings @ $0.00		$ 5,820 00
Wages of 1 engineer, $1,200, and 2 firemen, $1,200		2,400 00
Wages of dummy tenders, $2.50 per day, $912.50 per annum		21,700 00
Wages of conductors, $2.50 per day, $912.50 per annum		21,700 00
Maintaining 24 cars @ $180		4,320 00
Maintaining 24 dummies and gripe @ $200		4,800 00
Maintaining wire rope		10,000 00
Maintaining engine and running machinery, 16% on $20,000		3,000 00
Interest on cost of entire road, $241,770.55 @ 6%		14,506 71
Total		$88,246 71
Horse road	$138,880 00	
Cable road	88,246 71	
Showing a saving of		$50,633 29 per annum,

Or 36.46% on cost of running a horse railway, in addition to which must he added the increased carrying capacity of the cable road.

By examining Tables E and F, an estimate will he found of the comparative annual expense of the horse railway and cable railway having the same carrying capacity.

TABLE E.

RUNNING EXPENSES PER ANNUM OF A HORSE RAILWAY WITH 32 CARS, EACH SEATING 22 PASSENGERS, SPEED 4½ MILES PER HOUR, HEADWAY 2½ MINUTES ON 3 MILES OF DOUBLE TRACE.

Estimate of running expenses same as Table C.		$138,880 00

TABLE F.

RUNNING EXPENSES PER ANNUM OF A CABLE RAILWAY, 12 CARS AND 12 DUMMIES, SEATING 44 PASSENGERS TO CAR AND DUMMY, SPEED 6 MILES PER HOUR, HEADWAY 5 MINUTES ON 3 MILES DOUBLE TRACE.

Coal screenings, 730 tons, @ $8 00	$ 4,380 00	
Wages of engineer, 1,200, and two firemen $1,200	2,400 00	
Twelve dummy tenders @ $2.50 per day, $912.50	10,850 00	
Twelve conductors, @ $2.50 per day, $912.50	10 850 00	
Maintenance of 12 cars, @ $180.00	2,160 00	
Maintenance of 12 dummies and grips, @ $200	2,400 00	
Maintenance of wire rope, life 1½ yeas	8,533 75	
Maintenance of engines and running gear, 15% on $20 000	3,000 00	
Inst. on entire cost of road, @ 6%	14,506 71	$59,085 46
Saving by wire rope system, 57 45-100%		$79,794 54

It will be observed that the horse cars, each carrying 24 seated passengers, depart every 2½ minutes, whilst the cable car and dummy, carrying 48 seated passengers, depart every 5 minutes.

The carrying capacity of the cars and dummies on the cable railroad can be increased *ad libitum.*

In all the foregoing calculations the costs of administration and office work are considered the same, and do not enter into the calculation.

Table C places the running expense of a horse road (exclusive of administration) at $138,880 per annum or $380.50 per day, which at 5 cents per passenger would require 7,610 passengers per day to pay expenses.

If the line carried its full seating capacity and ran 18 hours per day on 2½ minutes headway it would carry daily 9,504 passengers at 5 cents, equal to $475 20.

The cable road, Table D, in the same number of hours, under same headway, would seat 19,008 passengers at 5c, $950.40, making a daily earning of $475.20 more than the horse road, or an actual gain of $171,072, which, added to the saving in the annual running expenses of (See Table D) $50,633.29, would effect a total annual saving in favor of the cable road of $221,705.29.

On page 164, we give several engravings, Figs. 21, 22, 23, 24, 25, showing sections of the lines of each of the prominent cable roads of this city.

The following Table shows the conditione under which the various Cable Roads in this City now operate.

Names of Roads	CLAY ST. HILL R. R.	SUTTER ST. R. R. CO.	CALIFORNIA ST. R. R	GEARY ST. R R
Commenced operating	September 1, 1873.	January 27, 1877.	April 9, 1878.	February 16, 1880.
Length of road, double track	5,300 feet.	On Sutter St., 13,291 ft. On Larkin St., 3,712 ft.	12,651 feet.	13,200 ft.
Heaviest grade	307 feet in 2,800.	167 ft. in 4,300	265 ft. in 2,800.	83 ft. in 1,925.
Number of engines employed	Two.	Six—4 on Larkin street, 2 on Cemetery Avenue	Two.	Two.
Dimensions of cylinders	14x28 inches.	12x24 inches.	22x36 inches.	18x48 inches.
Piston speed per minute	532 feet.	340 feet.	540 feet.	368 ft.
Number of Boilers	Two.	Six.	Three fire hox.	Three steel.
Diameter and thickness of shell	16 ft x 54 in., 5-16ths thick 16 ft x 48 in., 5-16ths "	2 each, 54x16 in., ⅜ thick 2 " 48x16 " ⅜ " 1 " 52x15 " ⅜ "	57 in. diam., 7-16th thick.	52 in. diam. 16 ft. long, ⅜ in. thick.
Number and size of tubes	42 3-inch tubes. 56 3½-inch tubes.	53 3-inch tubes 53 3-inch tubes 58 3-inch tubes 49 3-inch tubes	81 tubes, 3 in. diameter 12 ft. long.	63 tubes, 3 in. diameter, steel.
Average pressure in boilers	57½ pounds.	100 pounds.	70 pounds.	65 pounds.
Pressure necessary to move empty rope	15 pounds.	40 pounds.	15 pounds.	9 pounds.
Consumption of coal per day, and kind	3,700 lbs. Wallsend, Sydney.	24,640 lbs Seattle Nut coal	16,180 lbs. Seattle screenings.	11,230 lbs. Seattle Nut.
Weight of empty car	2,800 pounds.	3,000 pounds.	4,000 pounds.	4,000 pounds.
Weight of empty dummy	2,100 "	2,000 pounds.	3,000 pounds.	4,800 pounds.
Intervals of departure	3 to 5 minutes.	4 minutes, average.	5 minutes, average.	2½ to 6 minutes
Average number of round trips per day	221	253	226	228
Average number of cars and dummies employed	7 of each.	14 of each.	14 of each.	16, week days; 20 Sundays.
Hours run per day	17½	19½	19	19
Number of wire ropes in use	One	Four—Sutter street, 3 Larkin street, 1	Two	Two.
Lengths of ropes used	11,000 feet.	11,587 feet 7,843 " 9,800 " 8,500 "	8,840 and 17,055 ft.	15,600 and 11,000 feet.
Circumference of wire rope	3 1-15th inches.	3-inch.	4½ and 4 inches.	3-inch.
Kind of ropes used	Crucible steel, 6 strand 19 wires.	Crucible steel, 6 strands of 19 wires.	Crucible steel, 6 strands of 19 wires, Norway iron.	Crucible steel, 6 strands of 19 wires.
Speed at which ropes travel	528 ft. per minute.	431 ft. & 785 ft. per min.	537 ft. per minute.	600 and 550 ft. per minute.
Average life of ropes	547 days.	304 days.	373 days.	2:4 days.
Remarks	The engine house is located on top of the hill and about midway between the two ends.	Tbis company has two engine houses. In the one there are 4 engines, and in the other are 2.	The engine house of this company is ocated in the hollow, 4,220 ft. from Kearny street.	The engine house of this company is situated 8,900 ft. from Kearny street.

THE Merced *Express* wants a colony started in its county. To make a success of such an enterprise, it says, it only lacks "capital, and a man or company with braine and vim enough to use it."

THE Lake Superior mines, during the year 1880, produced copper amounting in value to $9,947,673.

AT latest accounts the hydraulic pump at the Combination shaft was working smoothly and successfully.

THE south branch of the Sutro tunnel is nearing the Forman shaft.

JOHN CHURCH, manager of a large mill in Tombstone district, Arizona, has entirely discarded the use of chemicals as aids to amalgamation, and returned to plain, matter-of-fact processes of gathering the precious metals by the use of quicksilver alone. He is getting better results at much less expense than by the former treatment.

THE Nevada *Transcript* says that the loss by the use of Frue concentrators in the Providence quartz mill is but 42 cents in gold and $1.14 in silver per ton.

MORE miners are being employed on the Comstock now than at any time since the collapse of the Sierra Nevada deal.

New System of Mine Drainage.

About three years ago Mr. John Patten of this city obtained a patent through the MINING AND SCIENTIFIC PRESS Patent Agency for an ingenious device for raising water and compressing air, which was also in the form of an unlimited siphon. This machine, however, was not placed on the market, for the reason that it was not deemed economical, inasmuch as it had two pipes and sections every 30 or 40 ft., which rendered the machine expensive on account of losing a large amount of power by the elasticity of the air.

The inventor being aware of these difficulties when the patent was obtained, instead of exposing for sale his original contrivance, deemed it best to overcome the difficulties and objections to his inventiou; and was so far successful that about a year ago he informed his friends that he had accomplished his object, and was ready to proceed. Accordingly, a company was organized, known as the International Water Elevating Company (No. 202 Bush street), to which was assigned the first patent together with the improvements and modifications newly developed. The invention may be briefly described as follows:

First, an unlimited siphon which consists of one plain water pipe which conducts the water from the inlet to the outlet. This pipe is connected at each end with a chamber in which a quantity of compressed air is confined which balances the column of water.

Second, a hydro-pneumatic pump, which has sometimes been incorrectly styled "an unlimited suction pump," to be used in mining operations. This consists of a common water pipe extending from the bottom of the mine to the surface. Within 20 or 30 ft. from the sump this pipe is connected with an air chamber in which there is an artificial atmosphere great enough to balance the column of water. The top of the pipe is connected with a kind of a pump on which the power used for elevating the water is exerted. The upper pump consists of two cylinders of equal capacity provided with pistons or plungers. One of these cylinders is always connected with the pipe which goes down the mine, while the other is alternately connected with the discharge pipe and the other cylinder. The pistons are attached to the engine which is to furnish the power of elevating the water.

These pistons are single-acting, and when they are receding, both cylinders are connected with the pipe that goes down in the mine, and are filled with water from it. When the engine is making the return stroke, two simple valves change the arrangement of the ports, causing the water to be forced from one of the cylindere through the discharge pipe into the atmosphere, while the full force of the engine is exerted on the water in the other cylinder, driving it back down the pipe to transmit power to the air-chamber.

The hydro-pneumatic pump, which is placed within 20 ft. of the sump, consists of a large-mouthed air chamber having a piston intervening between the air chamber and the two cylinders, the pistons or plungere of which either form a part of, or are fixed stationary to, the large piston in the air chamber. One of these cylinders is always connected by an open port with the water pipe which joins the two machines, and the other cylinder is connected with the same pipe by means of an egress valve, and with the suction pipe through the medium of an ingress valve. Its operation is as follows:

When the force of the engine is exerted on the top of the column of water, driving it downward, its pressure is exerted against the piston which is always connected with the main pipe, and forces it up; and as all three pistons are fixed rigidly together, the large piston is forced into the air chamber, and the other piston is raised, thus drawing the water from the sump through the suction pipe into the cylinder.

When the upper engine reaches the end of its stroke and commences to recede, the compressed air reacts on the piston and forces the water out of both cylinders into the water pipe, and as the capacity of the lower cylinders are equal to the capacity of the upper ones, a sufficient quantity of water is forced through the pipe at each stroke to fill the upper two cylinders. From the above it is plainly seen that at every stroke of the engine, there is a cylinder full of water received through the suction pipe at the bottom, and exhausted through the discharge pipe at the top. The water in the pipe is forced up and down, and while it is ascending, the pressure in the pipe is that produced by the weight of the water, and while descending the force of the engine is exerted on it causing double pressure. The water always ascends twice as far as it descends. At each end of the stroke the water must be stopped and started. This is easily accomplished by the operation of the ingress and egress valves at the bottom. For explanation, when the engine begins to drive the water down the pipe the lower egress valve is open so that the pressure is exerted against both plungers. While the water is acquiring its velocity, and as soon as it has attained the required velocity, the egress valve closes and the ingress valve opens allowing one cylinder to be filled from the suction pipe. In this position the engine makes the remaining portion of the stroke. When the upper engine reaches the end of its stroke, the water continues to move down the pipe for an instant, until its inertia is exhausted in forcing the piston in the air chamber and then it comes to rest. The air immediately reacts on the piston, and the ingress valve is held open until the water in the pipe attains the required velocity and then closes, and by the remaining portion of the stroke the water is forced from both cylinders into the main pipe. From the above, it is clearly seen that the force used for stopping and starting the water is equal to the force of gravity, and consequently the time required is very small. For example, if the velocity of the water be 8 ft. per second, the time required to stop or start it will be ¼ of a second; if the velocity he 16 ft., the time will be ½ of a second; if 32 ft., 1 second, and so on. There is nothing lost in stopping and starting the water, because the inertia given out by stopping it is utilized in starting it in the opposite direction. It is impossible to create any heavy strains on any portion of the machinery above the natural working pressure, on account of the bottom of the column being connected with the chamber.

Before starting the machine, the air-chamber is filled at the required pressure with compressed air, which remains confined in the chamber as an artificial atmosphere, the pressure of which is great enough to balance the column of water which is being raised. While the pump is in operation, it is continually forcing a sufficient quantity of air in the chamber to overcome the leakage, which is very small. The surplus is allowed to escape through a safety-valve, so that there is no difficulty in retaining the required pressure. A machine of this description has been built and set up at Nos. 18 and 20 Fremont street, this city, where we saw it at work this week. The pipe through which the water is raised is 60 ft. long and two inches in diameter. While working at its normal capacity, it raises 40,000 gallons per day to a hight of 60 ft. A pressure gauge attached to the lower end of the column shows that the machine is never exposed to a strain above the ordinary working pressure. The inventor claims that by reason of the extreme simplicity and positive action of this machine, it is one of the most effectual and economical devices in the market for raising water out of mines. The use of pump rods, bobs, etc., being dispensed with without putting in an extra pipe or other analogous means for the transmission of power, diminishes the wear and tear of the machinery, lessens the chances of accident and greatly reduces the first expense of the machinery.

The Harris Dry Gold Separator.

Among the various exhibits in the mining machinery department in the fair is the Harris dry gold separator, a machine, as its name indicates, intended to work auriferous earth without water. There are many places in Arizona, New Mexico and Mexico where the surface dirt is gold bearing, but where there is no water with which to work it. The old Mexican plan is very crude. It consists in winnowing or throwing the earth up and down on a raw hide in the wind, the nuggets being saved. Of course this will only do with coarse gold. Modern invention has elaborated this crude idea, however, in such a way that earth containing fine particles of gold can be utilized, and not only the nuggets but the finer gold be saved.

The Harris machine is so constructed as to have two currents of air, one to agitate the material and the other to carry off the dross while the gold is being separated. The machine has a good solid frame, bolted together with rods, and can be readily taken apart and put together. The earth is poured into a hopper, and falling from the hopper to the riffle board it passes through a current of air from a rotary fan behind the hopper. The riffle board is composed of drilling or canvass stretched over a wire screen or frame, under which is a bellows, worked by the same mechanicism as the blower. This bellows blows a pulsating, intermittent blast up through the riffle bed, agitating the earth that has fallen there, and carrying on a sort of process of concentration. The finer particles of dirt and dust are blown away by the blower before falling to the bed; but this agitation throws up some fine particles into the upper blast which carries them away. Riffles are placed at suitable distances apart on the riffle bed and behind these the gold catches.

The difficulty with most of the dry washers is a tendency of the dirt to pack. In this the finest of the dust is thrown away before reaching the riffle board, so there is, of course, no chance for that to pack. Neither water nor quicksilver are necessary to work dirt with this machine. They are made of tubular iron, with no cogs or cast iron to wear out or break. The manufacturers, James Harris & Co., 308 Mission street, informs us that their machines have been thoroughly tested in several places, and have been pronounced a success by those using them. One of them is used in Lower California, one in Butte Co. and several in Arizona. An adjustable round belt runs the machinery, so there are no gears. The capacity is said to be from 30 to 40 tons per day of ten hours, according to kind and nature of soil. They are to run by hand, though large ones are made to run with steam or horse power.

THE Coos Bay *News* says: Work on the entrance to the Coquille has been suspended, as the amount appropriated by Congress has been expended. It the necessity of more aid is properly represented to our members of Congress, another appropriation can easily be obtained.

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List of Entries of the Sixteenth Industrial Exhibition of the Mechanics' Institute of San Francisco.

Explanations:

The Pavilion is divided into eight divisions, indicated by the figures 1, 2, 3, 4, 5, 6, 7 and 8 posted at the ends; also 26 sections, indicated by the alphabet, viz: A, B, C, etc., at the sides. Division 1 embraces all exhibits along the wall on the Eighth Street side. Large letters and figures are posted up, near the ceiling, in the Pavilion (on the ends and sides), corresponding to those used in this Catalogue.

The Gallery is divided into five divisions. The Art Gallery has a separate Catalogue; its rooms are known as Nos. 1, 2 and 3.

The following abbreviations will be used throughout the Catalogue:

Division;	Section;	Gallery;	Room;
div	sec	gal	rm

For instance, "div 8, sec E and F," is used in abbreviation for "Division 8, Section E and F."

The publishers can only include in this list such articles as have been duly entered in the books of the exhibition and receipted for by the Entry Clerks. Notice of any errors or omissions should be given to the Secretary of the Board of Managers that the annual report may be as complete as possible. This list has been as carefully prepared as possible by Entry Clerk, W. S. Batchelder.

1 Oldham, Nettie: 1 Hair Wreath. art gal

2 Sherill Plow Co.: 1 3-Gang Plow, 1 4 Gang Combined Plow, Seeder and Cultivator. div 2, sec Z

3 Riccard, M'lle Marie: 1 Water-color Painting. art gal

4 Riccard, M'lle Albertine: 2 Water-color Paintings. art gal

5 Webster, Miss Atlanta: 1 Bird's Nest (Golden Oriole). div 1, sec J, gal

6 Silvey, R. W.: 1 Oil Painting, by Murillo, 1 Steel Engraving of Henry Clay. art ga

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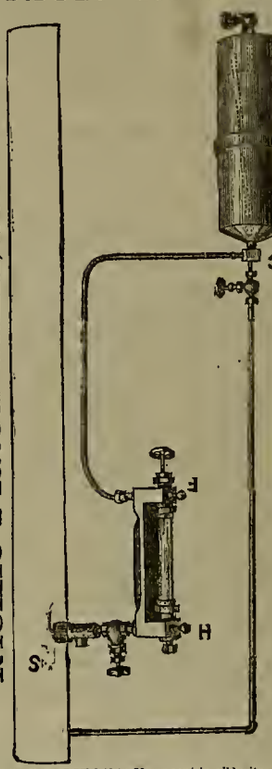

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7 Slocomh, H. & Co.: 4 Dibble Lubricators—on main engine and Garratt's steam pumps; div 8, sec Q

8 Rogers. Mrs. S: 1 Patch Quilt, mads by Harry M. Rogers, 10 years old. div 1, sec M, gal

9 Creswell, Mrs. Leslie: Crocheted Spreads. div 1, sec M, gal

10 Johnston, J. J.: 2 Soldering Machines. div 8, sec P

11 Riesland, Peter: 1 Model of Man-of-war Constitutiou. rm 3, sec E, gal

12 Dwyer, Agnes M.: 2 Lace Pillow Shams. rm 3, gal

13 Savannah, J.: (age, 14 years) 1 Water-color. art gal

14 Pursell, G. M.: 1 California Washing Machine. div 6, sec L

This was an exhibit of an improved washing machine, known as the "Californian," simple in construction, with a false bottom, iron hox springs to hold ths ruhber down, and a devics hy which tbe ruhher can be held up leaving ths tuh open and free. This machins is an improvement on the well known "Humholdt." An experimental test made on shirts, lace curtaius and delicate fahrics proved that it would wash four shirts to one hy hand, and delicate buttons sewed on the fahric in this puhlic test, remained unbroken. It has worked 100 shirts in 80 minutes, and is the perfection of washing machines.

15 Gruher & Fest: 4 Historical Paintings. art gal

16 James, D. B.: Single Track Railway. div 8, sec C

17 Ryder, Miss Emily: 1 Water-color Painting, one plate painted on porcelain, 1 do. in oil. art gal

18 Tieroff, Miss Pauline: 1 Crochet Quilt. div 1, sec M, gal

19 Logan, M. H., M.D.: Picture of Moses. art gal

One of the striking and attractivs pictures in the Art Gallery, was a crayon painting of "Moses" hy a young lady artist, Miss Minnie Logan, of St. Helena and sister of Dr. M. H. Logan of this city. On each evening gronps of visitors gathered aronnd this picture discussing its merits and the prominent characteristics of this noted law-giver. It was copied from a medal nnearthed in Jeruselum 50 years sgo, and as far as known, no other one is in existence. On one side is the hust of Moses in bold relief, on the other the first commandment is inscribed in Hebrew characters. The medal is in bronze, in a good state of preservation and can be seen in the collection of Dr. Logan, on Geary St. This promising young artist has made a faithful copy, hringing out the characteristic features of this remarkable man. On the side of the head appears the ram's horn and helmet and on the broad hem of his garment abont the neck is worked the Hebrew characters for Moses. On the lower margin of the picture are the Hehrew characters of ths opposite of the medal, and critics who have sxamined it prononnce it a msster piecs of art and one of the very commendable exhibits of onr own artists.

20 Tsynton & Derickson: 1 Adjustahle Header Wagon. div 6, sec Q

21 Wilson G. Taylor: 2 Oil Pnintings. art gal

22 Falkenstein & Co.: 2 Show Cases of Cigars and Tobacco. div 6, sec W

23 Benn, John S.: Artificial Flies. div 6, sec V

24 Miller, Mrs. Clara: 1 Ostrich Feather Quilt. div 1, sec M, gal

25 Pike, Miss Ella: 1 Lace Pillow Sham. rm 3, gal

26 Still, W. G.: Hitchcock Kerosene Hou Lamps; Perkins & House Library Lamp Catlin's Improved Student Lamps; Leader Student Lamps; Novelty Lamps. div 3, sec T

27 Jones, Miss M. H.: 1 Oil Painting art gal

28 Cook, Mrs. E. M.: 2 Landscapes, 4 portraits. art gal

29 May, Mrs. N. E.: Moss House. rm 3, gal

30 Lange, John C. R.: Willow and Rattan Ware. div 4, scc S

These goods consisting of a fine parlor set, flower tahles, infants' high-chairs, walking-stools, cradle, lunch baskets, and many other articles in his line of business. All of these goods are very handsome, and the general admiration of visitors. Tne factory is at No. 12 Montgomery Ave, S. F. All orders hy postal cards will he promptly attended to.

31 Dykes, H. J.: Air Cooler and Purifier. div 6, sec Q

32 San Francisco Gas Light Co.: Samples Ammouia Sulphate, Chloride and Carhonate, Boiler Preparation, Liquid Ammonia, etc. div 3, sec S

33 Clayburgh, Mrs. Celia: Needle Work Picture. rm 3, gal

34 More, Mrs. L. C.: Specimens Porcelain Painting. art gal

35 Schmidt, Mrs. Louisa: Fancy Basket. rm 3, gal

36 Klinkner, C. A.: Red Rubber Stamps and Stencil Plates.

This exhibit was full and complete of all sizes and patterns of Stencil Plates, Patent Metalhodied Rubber Type of different styles, Nickle Plated Type Holder, Indelible Ink, Pads, Tweezers, Red Ruhber Stamps, Printing Wheels, Self Inking Dating Stamps, making the most perfect outfit for family printing ever produced, which can be procured of this manufacturing honse, 320 Sansome street, S. F., at a small cost. This Industry is assuming large proportions as every business house and family can become their own printers. A novelty was shown in a pocket stamp ndjusted to an ordinary pencil, which is always ready and inksd for stamping your name and address. This houss has had a large experience in thsir business, are fully equipped in thsir line and are prepared to fill orders, wholesale and retail. This industry has coms to the front as a necessity to ths office and family, and among the many houses dealing in these articles, there are nons who have a more varied stock, or sell the best goods at lower prices than the pioneer firm of C. A. Klinkoer, 320 Sansoms street, San Francisco.

37 De Long, Francis: Cider and Vinegar. div 3, sec N

This exhibit wss the succession of of a displsy which has heen made formerly by Messrs Sweetzer and De Long for ysars, and now continned by Francis De Long the successor in interest to the celebrated Novato Ranch, in Marin county, on which is an orchard of over 200 acres. From the commencement it has heen the practice to nse none hut sound, clean apples, and make pure cider and pure cider vinegar, without any foreign ingredients or doctoring. Following this practice for years, has given them and their "cider from the Novato Ranch" a State reputation, and a demand for Novato Ranch cider, which is far heyond the supply. For this year's crop, orders are registered ahead and filled only until the ripeness of the apple, proper age and racking of the cider has been completed. Those wishing pure cider, hoiled cider, pure cider vinegar from the Novato Ranch can leave their orders with the city agent, Mr. Moore, 117 Pine street, S. F.

38 Mallon, John: Ornamental Glass. div 3, sec L

39 Foye Bros.: Bixby's Shoe Blacking and French Shos Dressing, Dixon Crucihle Co. div 6, sec T

40 Fisher, Mrs. Abbie: Prsserves. Jams and Sauces. div 3, ssc O

41 Stevens, H. R.: Vegetine. div 3, seo O

42 Columbia Soap Works: Soap. div 5, sec W

43 Oshorne, D. M. & Co.: 1 No. 10 Combined Header and Self-binding Harvester; 1 No. 6 Combined Reaper and Mower; 1 No. 3 Single Reaper; 1 No. 1 Single Mower; 1 No. 2 Single Mower; 1 No 5 Single Mower; Header Attachment for Self-Binding Harvester. div 3, sec Z

44 Joy, E. W.: Joy's Florida Water and Perfumes, and Joy's Emulsion of Cod Liver Oil with Hypophosphites. div 3, sec O

The preparation last named above is an entirely new srticle, as made according to Mr Joy's recent discovsry. For reasons, too lengthy for description here, the preparation is mads efficacious in many cases where other preparations of cod liver oil would fail to restore. It is as yet made only in this State, and by Mr. Joy. Its use is rapidly extending, and its virtues render it worthy of hecoming generally and speedily known. Circulars can he had by addressing Edwin W. Joy, Chsmist snd Apothecary, cor. Post and Mason streets, San Francisco, Csl.

45 Matthews, H. E.: Audiphones. div 3, sec N

46 Wehster, J. H.: Fret Sawing. div 6, sec M

47 Brehm, R. W.: Wood Turning. div 6, sec K

48 Redstone, A. E. & F. E. Hill: Sweepstake Qusrtz Mill, Challeuge Amalgamator div 8, sec 8

49 Warren, Col.: Eucalyptus Tree Productions, and Collections of early Productions. div 2. sec V, gal

50 Farrar, B. F.: Spring Beds and Mattresses. Furniture. div 4, sec Q, gal

51 Willmore, Wm.: Mirabile Dictu. div 3, sec O, gal

52 Kittle & Co.: Coates' Thread. div 3. sec N, gal

53 Horton, Miss E. L.: Turkish Rugs. div 3, sec F, gal

54 Scott, E. A. & Co.: One No. 1 Davis Wrought Iron Header Wagon; one No. 3 Davis Wrought Iron Farm Wagon; one 4th class La France Steam Fire Engine. div 1, sec U

For information relating to the above exhihit, address. E. A. Scott & Co., P. O. Box 1202, San Francisco, Cal.

55 Lincoln, O. J.: Self-adjusting Hammock Chair. div 3, sec K. gal

56 Main & Winchester: Harness and Saddlery. div 5, sec A, gal

57 Gendar's Candy Factory: Exhibition of Candy. div 6, sec N & div 3, sec M, gal

58 Lantheaum, John: Waffle Machines. div 2, sec D

59 Ciphers, D. S.: Pop Corn Machine. div 6, sec M

60 Wilmerding & Co: Peruvian Bitters. div 3, sec W

61 Standard Soap Co.: Soap. div 5, sec T

62 Reed, Roht.: Case of Artificial Limbs. rm 3, gal

63 Denniston, E. G.: 2 Cases Silver Plated Goods, Amalgamating Plate. div 5, sec R & div 8, seo U

64 Marsh, R. G.: Fine Japanese Goods. div 2, sec W, gal

65 California Silk Manufacturing Co.: Samples Silk Thread. div 3, sec V, gal

This was an exhihit contained in one ornamental mammoth case and two smaller ones, of all kinds nf silk thread and twist, arranged in a very attractive and artistic msnnsr. This commendahle industry has heen moving forward year after year in msgnitude and extent, until now they employ 140 persons, over 100 heing young girls and women. A capitnl of hetween $100.000 and $200.000 is used in carrying this enterpriss forward; their monthly expenses bsing from $12,000 to $15.000, an increase of from $1,500 tn $2,000 over last year. The wages paid are 60c. to 90c. and $1 for unskilled lahor, and $5 to $6 for skilled labor. They mske all kinds of thread for domestic snd manufacturers' use, and of a quality superior to any thread in this market. As a home industry it should be fnstered and encouraged as our State is especially adapted for silk culture. Ths proprietors; Rodgers, Myers & Co., and the enterprising agent, Robert Y. Yates, are deserving great credit for promoting this industry to such a state of perfection and unqualified success.

66 Tule Carpet Lining Co.: 4 Needls Sewing Machines. div 3, sec T, gal

67 Bodley, E. C.: 6 Eldridge Sewing Machines. div 3, sec Q, gal

68 Andrews, H. P.: 6 Williams' Sewing Machines. div 3, sec Q, gal

69 Marwedel, C. F.: 3 Casss Machine, Moulders, and Specisl Tools. div 6, sec Q

70 Dabney, Garland A.: Buggy made of iron gas pips. Combination Churn and Ice Cream Freezer, Pendulum Reverse Motion. div 3, sec P

71 Bray, W. H.: Improved Step ladders. div 6, sec G

72 Morrow. Mrs. & Co.: 2 Cases Skirt-supporting Corsets. div 3, sec G, gal

73 Fisher. A. A.: 18 American Sewing Machines, 6 Hand do., 1 Button Hole do. div 3, sec H, gal

74 Clundt, Chas.: Fret Saw Work. div 3, sec P

75 Toplitz, J. B.: Shirring Machine. div 3, sec H, gal

76 Gates, J. H.: Pepsin Wine Bitters. div 4, sec R

77 Thstcher, Geo.: Cremorne Punch. div 3, sec R

78 Boericks & Tafel: Homœopathic Medicines. div 3, seo O

79 Downing, A. F. & Son.: Murray & Lanman's Florida Water and Perfumery, Ssmples Liehig & Co., Coca Beef Tonic. div 4, sec M

80 Bailey, Miss Harriet F.: Paper Sculpture Work. div 3, sec M, gal

81 Wiester & Co.: Oil Stoves, Household Utensils, Useful Inventions. div 4, sec F

82 Burr, G. W. & C. H.: Slop Hoppers, Weather Strips. div 6, sec S

83 Burnett, G. G.: Perfumery, Elixir Peruvian Bark and Iron. div 4, sec N

84 Aaron, Miss Fanny: Show Case of Shirred Work. div 3, sec H, gal

85 Peake, Chas. & Co.: Turkish Rugs. div 3, sec J, gal

86 Hagans, G. W.: Sheet Music, Music Typographer—1 Pisno. div 3, sec T, gal

87 Simmons, S. D.: Bread Cutter. div 6, sec R

88 Totten, Chas. A. L.: 1 Strategos (American Game of War). rm 3, gal

89 Curtis, Edward: Canoe.

90 Sack. W. M.: S lf measuring Liqnid Tank. Self-Cleaning Compression Filtering Faucet. div 6, sec L

91 Eland. R.: Wilson's Pacific Gas and Water Sealing Trap. div 6, seo L

92 Pidge, D. M.: Novel Fans. div 2, sec W, gal

93 Williams, Wm. A.: 3 Soldering Machines div 7, sec O

94 Russell, Thos. & Co.: Clark's Mile End Spool Cotton—8 Cahinets, 1 Glass Case. div 3, sec L, gal

95 Wenzel, Geo. L.: Grape Crusher, Separator, 2 Wine Presses. div 2, sec X

96 Waterhouse, F. A.: Oil Painting. art gal

97 Mackay, Alex.: Brussels Carpet, Rag Carpet, Packages Carpet Warp, Pieces Border. Rngs, Carpet Loom in Operation. and Cocoa Mats. div 4, sec T, gal

Alexander Mackay mnkes and weaves Rag Carpets (to families furnishing material) for 35 and 40 cents per yard, finding warp.

98 Sbrieve & Wolf: 4 Cases Gnns and Pistols. div 6, sec V

99 Anderson & Fassier: Russian Polish. div 3, sec R

This waa an exhihition of a powdered snhstance for cleaning all kinds of metal and glassware. The finest compound in the world, instantly removing all dirt, tarnish and fly specks. When applied to mirrors it gives a hrilliant polish and keeps flies away for a month. It is in general use in the fire departments of San Francisco, Stockton and Sacramento, and in restaurants and saloons. It contains no poisonous element. A child can use it with perfect safety. It can be applied to any surface. Laboratory and manufactory, No. 305 East street, S. F. Box 15c; 2 boxes for 25c; or $1 per pound.

100 Studabecker, J. A.: Tailor's Square for Cutting Ladies' and Children's Clothing, *Fashion Review Monthly.* div 5, sec B, gal

101 Bowman, Mrs. Agnes: (76 years of age.) 3 Drawn Rngs. div 1, sec M, gal

102 Wm. Woodward: Collection Birds and Animals. div 2, sec W, gal

103 Rye Tonic Co.: Rye Tonic. div 3, sec T

104 Thompson, I D. & Son: The Governor Patent Medicine. div 4, sec U

105 Besmish, P.: Gents Furnishing Goods. div 6. sec U

106 Evans, J. J.: Stationery, and Patent Mniling Boxes. div 1, sec K, gal

107 Chapman, H. L.: Patent Express Wagon Rubber Springs. div 2, sec S, gal

108 Titus, J. T.: Pntent Sewer Trap, Gas, Tide and Flushing Gate Combined. div 7. sec N

109 Poheim, Jos.: Display of Tailoring and Clothing. div 3, sec P, gal

This was an exhihit of a fine line of imported and domestic fabrics of the latest styles and of the finest quality, with sample garments of different kiuds made, as Joe Poheim's establishments on Montgomery, Market and Third streets turn out daily. As a princs in the tailorng business, Joe Poheim stsnds at the head in quality, variety and cost.

110 Freud, M. & Sons: Cass Corsets (own manufscturs), 2 do. Patent Corsets, 2 do. French Woven, 2 do. do. Sewed. div 4, ssc P, gal

111 Roehnerts, Fred.: Rolling Top Mat" tresses. div 3, sec R, gal

112 Cushing, Rohert: Crayon Drawing, Nunciadina of San Marino, near Rome. art gal

113 Laeremans, Frank: Sofa Bed, Chair and Crih Combined, Operating Table. Speculum Chair and Sofa Combined, Extension Table and Sofa Combined, Mosquito Bar, Knell Invslid and Reclining Chair. div 3, seo R. gal

114 Cotter, Mrs. J. L.: Frame Preserved Flowers. div 1, sec J, gal

115 Schoenstein, F. B.: Orchesterion. rm 3, gal

116 Lancaster, J. & Co.: 42 Pieces Cloth, Pants. Coats, and Vest. div 3, sec L. gal

117 Bill. Mrs. M. E.: Mrs. Moore's Scientific Hair Producer. div 3, sec L, gal

118 Harvey, Mrs.: Mme. Young's Beaumondaire Zephyr Powder. div 3, sec M, gal

119 Franco American Perfumery Co.: Perfumes and Florida Water. div 5, sec Q

120 Wolffsohn, N. W.: Kid Gloves. div 5, sec Q

121 Figer Bros: Displsy of Brushes and Msnufacture. div 4, sec Q

122 Bowen Yeast Powder: Californis Yeast Powder, Sperry's Flonr. div 4, sec I

123 Lea, H. C.: 5 Americsn Coffee Pots, Glass Show Case. div 2, sec K

124 Claihurn, Miss Bsttie: Knit Quilt. div 1. sec N, gal

125 Hug & Woehken: Ssmpls Boxes. div 3, sec U

126 Woodard, W. W.: Charts, Adam's Synchronological Chart of History. div 2, seo D

127 Cavanagh, Eddy: Fret Saw Work and Brackets. div 3, sec G

128 Kelly, P.: 3 Cases Boots and Shoes, Patent Boot and Shoe Combined. div 5, sec R

129 Liddle & Kaeding: Gnns, Pistols, Fishing Tackle, and Sporting Goods. div 4. sec K

130 Taylor, S. P. & Co.: 26 Packages Paper, Pioneer Mills, 181 Packages Paper, South Coast Mills. div 7, sec F

The three pyramids of paper exhihit d by this house give hut a faint idea of the amount and variety of this material manufscured and kept in stock hy it. Mr. Taylor inangurated the paper manufscturing business at the Pioneer Mills, in Marin county, iu 1856, and this is consequently the "silver" anniversary of the enterprise. He has now in his possession an *Evening Bulletin* of April 13, 1857, printed upon paper by him then manufactured, which is firm and smooth, though slightly discolored by age. Of late years he has confined his attention to the various grades of manila and straw papers. of which former kind the Pioneer Mills make 300 tons per annum, hesides fruit paper—a fine, soft rag paper, which he bas made a specialty of ever since the opening of the Central Pacific railroad Of this he has call for 80 tons this year. He is also agent for the South Pacific Coast Mills, Soquel, Santa Cruz county, which turn out 700 tons of straw paper, using in the manufacture about 1,200 tons of material. The large establishment of the firm at 416 & 418 Clay street, is stored with every conceivahle variety of these two kinds of paper, as well as paper hags, ordinary and special kinds.

131 Ichi, Ban: Japanese Goods. div 5, sec P and Q

132 Strong, Geo. H.: 2 48-inch "Harvard Roadsters;" American Center Velocipede; Safety Bicycle "Pony;" 50-inch "Club" English Roadster; Patent Safety Bicycle "Extraordinary Challenge;" 54-inch "Stanley English Roadster; Hillman & Herbert Coventry Tricycle. div 6, sec P and Q

133 Berry & Place Machinery Co.: 2 Gas Eogines. div 7, section I and J

134 Behrenz, B.: Feather Brushes. div 6, sec G

135 Becht, G. J.: Eastman's K. C. Soap and Linen Glace. div 6, sec C

136 Brunswick, The J. M., Balke & Co.: 7 Billiard Tables, 40 Ten Pin Balls, 6 Racks Ivory Balls, Pins, Cues, etc. div 5, sec E and F

137 Cole, N. P. & Co.—California Furniture Co.: Fine Furniture. div 2, sec Y and Z

138 Souther, Jos. N. & Co.: Dr. Abernethy's Green Ginger Brandy. div 4, sec N

139

140 Frankheimer, Joseph: Aquarium. rm 3, gal

141 Lake, Henry: 10 cases Patent Shoe Blacking. div 3, sec N

142 Richards & Harrison: 50 cases Hub Punch; 15 cases Schiltz Beer. div 5, sec U and V

143 Escho & Jacoby: 11 pieces Ornamental Glass; 23 samples Stained Glass—Acid Work. div 3, sec V

144 Kohnweiler, David: Never Sink Cork Jackets. div 3, sec W

145 Hallidie, A. S.: Wire, Wire Rope, Cables, Clothes Lines and Picture Cord. div 6, sec I

146 Robinson & Hallidie: Scutt's Patent Barb Fence Wire. div 6, sec U

147 Cal. Wire Works: Wire Goods, Cloth, Summer Houses, Cages, Fencing, Railing etc. div 5, sec J and K

148 Hubbard, Mrs. E. H.; Human Hair Goods. div 2, sec W, gal

149 Gump, S. & G. & Co.: Mirrors, Ebony Cabinets, Statuary, Gilt Bouquet Tables, Cornices, Steel Engravings, Water Colored Engravings, Oleographs, Chromos, Gold, Oxydized Gold and Fancy Velvet Picture Frames, and Bric-a-Brac. div 2, sec Y and Z, gal

150 Ball, Geo. & Co.: One Straw Burning Steam Engine, 1 Separator, 1 Farm Wagon, 1 Fanning Mill, 1 3-gang Plow, 1 Sulky Plow, 1 Side Hill Plow, 1 Patent Steel Beam Walking Plow, 1 Self dump Horse Rake, 1 Cultivator. 1 Grain Seeder, full line of Agricultural Implements. div 1, 2 and 3, sec Y and Z

151 Good, A.: Good's patent Parlor Grate Damper. div 3, sec P

152 Woodin & Little: One new Improved Althouse Vaneless Windmill. div 2, sec X

153 Armstrong, Mrs. Wm.: 2 Paintings on Plate, 1 do. on Satin. art gal

154 Gilbert & Moore: Display of Sterling School Furniture. Novelty Man'f'g Co., Hartford Woven Wire Matrass Co., Wooton Desk Co., Ladd's Folding Chairs. Full line of Cabinet Work, a Specialty. div 4, sec R, gal

155 Schaefer. Miss D. R.: Display of Flowers. div 5, sec P

156 Latson, Frank P. & Co.: One case of Hardware, Samples Burgular-proof Locks. Bronze Goods. div 6, sec J

Frank P. Latson & Co. are importers and dealers in hardware and builders' materials, bronze, burglar-proof locks, etc. There can be found a large stock at No. 28 New Montgomery street, under Palace Hotel, San Francisco.

157 Mesenburg & Wescher: Patent Refrigerator for Cooling Purposes. div 6, sec L

158 Terrea, Mrs. E.: Knit Quilt. div 1, sec N, gal

159 Kenrna & Caldwell: Adjustable Fire Grate. div 1, sec D

160 Flournoy, Mrs. George: Bedspread made in 1817 by Mrs, Jas. S. Holman, of Texas, when 13 years of age. rm 3, gal

161 Brown, Carrie L.: Crochet Quilt. rm 3, gal

162 Wickson, G. G.: Eclipse Self-Regulating Incubator, Samuel's Artificial Hover, 2 Eclipse Artificial Hovers, 1 La Motte do. do. Display Imperial Egg Food, Assortment of Poultry Works, 1 do. do. Supplies. div 4, sec C, gal

163 Townsend, Miss J.: Tatting Bed Spread. div 1, gal

164 Antisell, T. M. & Co.: Display of Antisell Pianos, Cal. Made Organs, Hallet & Davis Pianos, Standard Organs. div 5, sec A, gal

165 Sheldon, Mark. S. M. Co.: Display of the following Sewing Machines: 13 Davis, 10 Howe, 3 New Stewart, 8 Household, 10 Chicago Singer, 2 cases Samples of Work. div 5, sec B, gal

166 Jackson, A.: Calendar Clock. rm 3, gal rm 3, gal

167 Jackson, Mrs. A.: Hair Wreath. rm 3, gal

168 Bennett, Miss A.: Lace Shawl. rm 3, gal

169 Mackenzie, J. R.: 15 Singer Machines. div 3, sec E, gal

170 Vienna Model Bakery: Bakery and Cafe, 2 Stands. div 4, sec M, gal

171 Gundlach, J. & Co.: Display of Cal. Wines. div 4, sec T

172 Cancelled.

173 Krueger, J. H: Walking Canes div 5, sec R

174 Nichols, H. C.: Pruning Shears. div 9, sec M

175 Milne & Gants: Patent Sanitary Water Closet. div 6, sec N

176 [This number is canceled.]

177 Garland, C. M.: The Garland Sewer Gas trap. div 6, sec N

178 Engelken, Mrs F.: Frame Wax Work. rm 3, gal

179 Thompson, Geo. C.: Soda Stands. div 3, sec I, & div 3, sec Q, & div 6, sec S—div 3, sec S, & div 3, sec R, & div 2, sec W, gal

180 *S. F. Chronicle:* Stereotypes of *S. F. Chronicle*, Roll Paper, used on *Chronicle*. div 4, sec E

181 Sanford, A. B.: Hall's New Pulsometer, Hot Water Heater, Steam Trap, 2 Deno's Pumps. div 8, sec O

182 Ohmen, W. H.: Engines. div 7, sec Q

183 Whitmore, E.: Buggy with Whitmore's Improved Gear, 2 Buck Wagons do. do. div 1, sec O

This improved gear is an end spring connecting to the axles close to the wheel the circle iron being above the spring, and the king bolt working freely through the axle with the rise and fall of the bed. It is especially adapted for buggies and buck-boards on pavements and rough roads.

184 Dewey & Co., Publishers: The MECHANICS' FAIR DAILY Steam Printing Establishment. div 6, sec P and Q

This newspaper is issued every evening at 7½ o'clock, and a large edition circulated free during each evening of the fair. Size of single sheet 23x32 inches. Double sheet 32x46. The quality of paper used is first class. The publishers aim to give concise descriptions of the most important inventions and articles on exhibition, penned by able writers and reporters. Also, brief items of the latest news, humorous paragraphs, incidents of the fair, programme of music for each day and evening, and all official announcements of the managers of the fair.

185 Dewey & Co., Patent Solicitors: Models of Patents and Pacific Coast Inventions; Copies of U. S. Foreign Patents. div 6, sec P and Q

186 Dewey & Co.: Six Volumes of the MECHANICS' FAIR DAILY Published at previous fairs. div 6, sec P and Q

187 Dewey & Co.: Six Bound Volumes of the *Mining and Scientific Press*. div 6, sec P and Q

188 Dewey & Co.: Six Bound Volumes of the *Pacific Rural Press*. div 6, sec P & Q

189 Dewey & Co.: 12 samples of Dewey's Patent Newspaper File Holders sec 6, div P and Q

190 F. De Guerre, & W. De Lano; Phœnix Adjustable Fire Grates. div 2, sec G

A grate that can be raised or lowered to suit all manner of cooking. Address No. 12 Market street, S. F.

191 Jewett, Sherman S.: Oscar S. Levy, Agent: Display of Crowning Glory, and Sherman S. Jewett's Ranges, and Stoves. div 1 & 2, sec I & J

192 Franetta, J, & Co.: Cigarettes, Turkish and Virginia Tobacco Manufacturers, 4 U Cigarettes. div 5, sec L

193 Bliven & Mitchell: Natural Mineral Water, Pure Eastern Cider. div 3, sec R

194 Elliot, E.: Patent Arch Fire Kindlers div 3, sec G

195 Stoddard, Jas.: Patent Hydrant Attachment. div 6, sec L

196 Emrick, Ernest: 2 Portraits, 2 Samples of Drawing, Penmanship, Water Color Painting, 2 Pen Drawings. art gal

197 Spencer, F. W.: Automatic Foot-rests. div 2, sec W, gal

198 Hartsborn & McPhun: Special Manufacturers of Window Shades, Opaque Cloth, Paper Hangings. div 4, sec T

199 Sellers, Mrs. S. A.: Household Silk Culture, French Annal Cocoons, Japanese Annal Cocoons, Bevoltines, Reeled Silk, Raw Silk, Silkworm Eggs, Silkworm Moths. div 3, sec W, gal

200 Cal. Silk Culture Association: Cocoons Silkworms, Eggs, Reel in Operation. div 3, sec W, gal

201 Giant Powder Co.: Samples of Powder. div 2, sec W, gal

202 Benjamin, J.: Hand-made Bu lion Quilt made by a New England lady, 90 years of age. rm 3, gal

203 Reed, Dr. B. F.: 1 showcase Fancy Work made by Miss Clotie Reed—College of Notre Dame. rm 3, gal

204 Melsing, Miss May: Chenille Work.

205 O'Brien, P. J. & Son; 2 Open Buggies. div 1 and 2, sec N

Among the displays of local manufacturers, that of J. P. O'Brien & Sons is not second best by any means. They exhibited side bar buggies which are very firm and staunch in construction, and present new features of excellence. The reaches are in the form of a V, about an inch square, and very firmly ironed at the rear end, the apex being united by a steel receiver, which with their steel fifth wheel, socket and safety book, makes the safest, most durable and trusty connecting gearing for buggies in use. They are side spring buggies, with steel equalizing rods, having arched wooden side bars, which are really the reaches, and by their arched form equalize the spring of the gearing and jar of the cobble stones or other roughness of road. They manufacture any desired style of buggy or wagon, and also exhibit an excellent set of wheels, only varnished, to show the perfection of joint, and excellence of wood used. Factory No. 329 Golden Gate avenue. Received first premium of Mechanics' Institute in 1880, and at the State Fair, same year.

206 Hale, Loeb & Co.: Chicago Steel Horse Shoe. div 6, sec R

207 Sanborn, A. W.: Express Wagon. Thorough Brace do., 2 Delivery Wagons. div 2, sec V

208 Hellwegen, Henry; 10 Oil Paintings, 11 Portraits, Cupid and Venus in Bar-room. art gal

The display of this young artist, recently from New York, is exceedingly varied in subject, and creditable in execution. Venus and Cupid, with one or two faults eliminated, are equal to the "Awakening" or "Andromeda" of previous fairs, while his many excellent portraits and "studies," evince industry and enthusiasm in art. No. 325. "Love's Labor Lost," is a striking picture. The lover, all anxious and triumphant at prospective success, as he pleads his suit and points out the way for flight; the lass, sorrowfully despondent and hesitating in her refusal to avail herself of the opportunity. The drawing is natural and coloring in good taste. "Rich and Happy" and "The Poor Beggar Boy," Nos. 321 and 322, are emblematic and in striking contrast as to surroundings, and yet the latter seems, from his countenance, to be the most contented of the two.

209 Dundon, Patrick F.: 1 Boiler model, 1 Improved Boiler Furnace Attached to Smoker Burner on Main Engine.

210 Therien, J. H.: Patent Windmill. div 7, sec K

211 Tay, Geo. H. & Co.: Display of Boss Coffee Pots, Ranges, Etc. Own Make. div 2, sec E & F

212 Perkins, A. J.: Display of Landscapes, (Photo Cabinets). Photos Retouched in India Ink and Water Colors. art gal

This exhibit is of an exceptionally artistic character. The plain photos are well toned, sharp in outline and minute in detail. The colored work is nicely blended, and above all natural. Mr. Perkins is a genuine artist, one that not only Hayes valley, but the whole city may be proud of. His gallery is at 337 Hayes street, San Francisco.

213 Sophy & McAaron: 1 Rockaway. div 2, sec T

214 Neumann, Joseph: Display of Cocoons, Raw Silks, Manufactured Silk and Thread, Silk Flags, Silk-reeling Machine—All California Manufacture. div 4, sec J

215 Neumann, G.: Display of Preserved Fruit—All Varieties—Own Make. div 4, sec J

216 Garratt, W. T.: Display of Bells, Finished and Rough Brass Castings, Goods of Every Description, Garratt's Patent Jackhead Mining Pump, do. do. Fire Hydrant, do. Log Jack, Pump and Valves, Fire Engines, Bell and Brass Foundry. div 7 & 8, sec K. L & M

217 Eisen Bros.: Display of Fine California Wines. div 6, sec J

218 Dodge, M. B.: Patent Rock Breaker. div 8, sec U

219 Harris, James & Co.: Dry Gold Separator—Tubular and Angle Iron Harrow. div 7, sec T

220 Hendy, Joshua: Roller Ore Feeder, and Wilbraham Rotary Pump. div 7, sec S

221 King, Morse & Co.: Hermetically Sealed Goods, Hand-made Cans, with Rosin. div 7, sec S

222 Huntington, F. A.: Huntington's Patent Oscillating Stamp Mill. Grinding Amalgamating Pan, Patten's Concentrator and Patten's Amalgamator. div 8, sec W

223 Linforth, Rice & Co.: Zimmerman's Fruit Driers, No. 1, 2, & 3; 2 Giant Riding Saws, 3 Blymyer's Church Bells. 28, 36 & 48 inch; 2 School Bells, 18 & 20 inch; 1 Mystic Carpet Sweeper, 1 Twin Dasher Churn, 1 10 ft. Enterprise Windmill, 1 No. 6 Rudel's Enterprise Coffee & Spice Mill, 1 Combined Wringer and Wash Bench, Enterprise Combined Sausage Stuffer, Fruit, Jelly and Lard Press, No. 25. div 7, sec I

The display of this firm, though not as extensive as some others, contains nothing but articles of real practical merit, of which we can conscientiously speak in terms of praise. Their Blymyer bells are in use all over the coast, and are unrivalled for power, durability and tone. The Enterprise Windmill, Horton & Kenedy's patent, is celebrated for its power in light wind, its wearing capacity, and its ability to withstand heavy gales. The Zimmerman fruit dryer is so cheap as to be in reach of the means of small orchardists, unexcelled for speed and the excellence of its products. Their two churns, the "Twin Dash," worked by a crank, and the "Dairy Queen" was pronounced a good butter worker by several old dairymen before they knew it was so intended, are models of beauty and experience. Their warehouse is at 323 and 325 Market street.

224 Tustin, W. I.: Ore Pulverizing Mill Designed for Wet or Dry Work. div 9, sec U

One of these machines has been in successful operation and approved by many mining men who have witnessed its workings, for the last eight months at the Ore Sampling and Pulverizing Works of Hofmann Bros., 415 Mission street, where it may daily be seen in operation. For particulars address: W. I. Tustin, inventor, patentee and manufacturer, 308 Mission street, San Francisco.

225 Boesch, Emile, Pacific Lamp Reflector Factory: Patent Locomotive, Mining, Ship, Railroad Car, Conch and Street Lamps, Franck's Patent Silver Plated Corrugated Glass Reflectors and Sun-lights, Metal Spinnings and Stamping. div 6 & 7, sec U

226 Gebler, Theo.: Dress Cutting System. div 3, sec F, gal

This system is the latest and most approved one on the Pacific Coast. It is one little rule, to carry one dozen in the pocket, and is strictly by inch or tape mensurement. He will call at any address in the city and cut either patterns or the goods, and give a square, true fit. He also teaches this system to satisfaction. For further information, address 1137 Mission street, S. F. Theo. Gebler, General Agent, San Francisco.

227 Buckland, Geo. G.: Buggy and Buckboard. div 2, sec O

228 Gale, Nellie: String of Buttons. div 1, gal

229 Pferdner & Co.: Clark's Noiseless Wheels, Stanyan's Bread Kneader and Mixer. Bradley's Boxes and Pails for Packing. div 7, sec F

230 Gordon Hardware Co.: Chain, Forge and Tools. div 7, sec T

231 Williams & Bourne: Multiplex Copy Tablet. div 7, sec F

232 Dunbar, Ella F.: String of Buttons. rm 3, gal

233 Horne, W. J.: Electric Belts, California Elastic Trusses. div 3, sec O, gal

234 Haulfuss, F. C.: Glass Engraver. div 3, sec O, gal

235 Crowley, Mrs. Thos.: Needle-worked Counterpane. div 1, sec M, gal

236 Gillette, Miss Ella: Worsted Wreath. rm 3, gal

237 Dilla, D. N.: Lewis' Combination Fire Extinguisher; 3 Combination Force Pumps; Exterminator and Injector. div 6, sec L

This exhibit consists of a hand pump, combining three instruments in one, that, to the farmer, gardener or horticulturist are invaluable. The small cost should place one in every household. As a spray maker it has no equal. Address 825, 29th street, Oakland.

238 Armstrong, Mrs. Wm.: 2 Water Color Paintings. art gal

239 Hawley, M. C. & Co: Rice Straw-burner Engine, Garr Scott Wood-burner Engine Canton Pitts Separator, Buckeye Self-raker Reaper. 2 Buckeye Mowers, 8 John Deere Plows. 4 South Bend Chilled Plows, 2 Buckeye Gang Plows, Gilpin Sulky Plow, 3 Cider Mills. 4 Howe's Scales. 2 Enterprise Coffee Mills. Champion Fan Mill, Challenge Feed Mill, 3 Burdick Hay Cutters, Garfield Mill, Cider Press. 6 Hitching Posts. 3 Lawn Mowers, Swinging Churn, Cream Cooler, Butter Worker, Sawing Machine, 2 Farm Bells, 5 Weather Vanes, 2 Balls for pole, Advance Cultivator, 3 Sulky rakes, 3 Pumps, 1 Brass Cylinder, Perkin's Windmill. div 6, sec Z

240 American Spring Bed Co.: 2 American Spring Bed Bottoms. div 3, sec J, gal

This Spring Bed claims a superiority over all others. It is durable, clean, adjustable, and for ease and comfort cannot be surpassed. It is especially adapted to hotels. Those who have tried it, never fail to recommend it to their friends. The inventor has made a useful combination in its construction. It not only dispenses with an under mattress, thereby saving labor and expense, but is also adjusted to persons of unequal weight. For further information address, American Spring Bed Co., 761 Howard street, S. F.

241 Beman, Wm.: Case of Trusses, Surgical Appliances and Artificial Limbs. rm 3, gal

This was an exhibit that attracted attention and favorable comment by the artistic display of different kind of appliances, but more especially for the Elastic Cork Truss. From numerous testimonials from leading citizens, recommendations from the California State Medical Society, in 1876–7, and the first premium at the Mechanics' fair 1880, Mr. Beman is not only known as a skillful and artistic surgical mechanic, but seems to have a mechanical genius in making appliances for the human family. The truss has no iron plates, hard springs or cumbersome pads to chafe and gall, or rust and corrode. Cork is a non-conductor, soft and elastic, and the truss can be worn sleeping, riding, dancing or swimming. Those who are afflicted can be helped and relieved by applying or sending to Wm. Beman, anatomical surgeon, Shiels' Building, 32 O'Farrell street, S. F.

242 Evertz, J. P.: List and Rag Carpeting. div 1, gal

243 Stettin, Mrs. H.: Stamping, Chenille and Linen Embroidery. div 1, sec H, gal

244 Strobridge, J. H.: Fleece of Wool. div 1, sec H, gal

245 Bargion, P.: Bargion's Patent Compound Rail. rm 3, ga

246 Powell, J. J.: Publication, Wonders of Sierra Nevada and Coast Range. rm 3, gal

247 Pacific Spring and Mattress Co.: Crandall's Patent Spring Mattresses, Bartlett's Slat Spring Bed. Furniture, Mattress, Parlor Sets and Lounges. div 4, sec L, gal

248 Brown, Chas. & Son.: Winthrop Portable Ranges, Wildwood Ranges, Belmont Ranges, Oil Stoves, and Stoves of all description. div 1 & 2, sec L & M

[CONTINUED ON PAGE 164.]

THE O'HARRA CHLORIDIZING FURNACE.

Patented in 1878.

SIDE ELEVATION OF THE O'HARRA FURNACE.

This Furnace is Constructed with two SEPARATE HEARTHS, one for DESULPHURIZING and one for CHLORIDIZING the Ore.

BOTH PROCESSES ARE PERFORMED AT ONE OPERATION.

—o—

An endless chain carrying conveyors or scrapers passes continuously through over both hearths, going one way through one chamber and the other through the other chamber. By this means the ore is fed and discharged at the same end of the furnace.

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The process is essentially the same as the well-known Freiberg process; but the mechanical devices applied to the furnace and the peculiarity of its construction enable the inventor to thoroughly desulphurize and chloridize the ore to a higher percentage than other furnaces, and with less cost for fuel and labor.

At Washoe and Ophir Tailings Mill it costs $1.10 per ton to work 40 tons in 24 hours.

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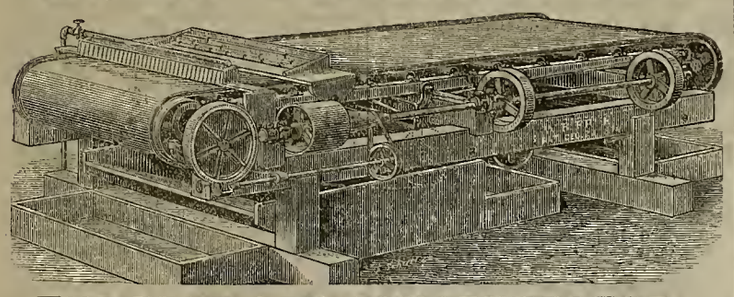

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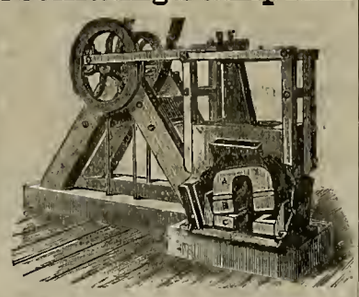

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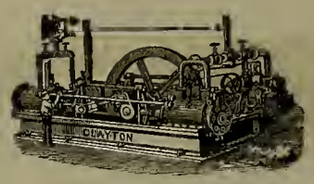

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[CONTINUED FROM PAGE 161.]

249 Haraszthy, Arpad: Wines, Champagnes, Brandies and Bitters. div 4, sec R

250 Marwedel, E. H.: Brass Bedsteads, Cornice Poles, and Window Shades. div 2, sec V & Z, gal

251 Erickson, Miss Josie: Crochet Spread Made by Herself. div 3, sec N, gal

252 Jackson & Truman: Jackson's Self-feeder for Threshing Machine, High Derrick Self-feeder with Bayley's Spreader, Patent Low Derrick. Elevator with Bayley's Spreader and Self-feeder Attached to an Agitator Threshing Machine, Improved California Winmill, Farmers Iron Blocks, Improved Vineyard or Orchard Harrow. Price Hay Press, 6 Jackson's Light Weight Horse Forks 3 to 6 ft., Patent 4 Section 60 Tooth Iron Harrow. div 4, sec Z

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253 Olsen, John: Model Ship. rm 3 gal

254 Palmer, C. C.: The Palmer Safety, Clutch for Elevators. div 6, sec J

266 Turre, Misses: Point Lace, Silk, Worsted, Chenille Gold and Silver Embroidery, Lamp-Mats, Aprons, Fire Screen, Sofa Cushion made with Devil Point, Crochet Work, Needle Work, Applique Lace, etc. div 1, sec D, gal

267 Dampf, Louis: Picture Frames, Passe Partouts, Engraving and Oil Paintings. div 2, sec Y & Z, gal

268 Josephi, Mrs. C.: Green Silk Pelisse, worn by a lady. div 1, sec H, gal

269 Ballou, Addie L.: Oil Painting. art gal

270 Stanford, C. P.: One-Wheel Battery or Crusher. div 7, sec W

271 Reynolds & Rix: Horse Whim for Mining Purposes. div 7, sec P

272 Grave & Co.: Display of Carriages, Buggies, Oppenheim Buggy. div 2, sec R

273 Larkin & Co.: Carriages and Buggies. div 2, sec P & Q

274 Baldwin, E. J.: Display of Baldwin's Grape Brandy, Angelica, Port Wine and Zinfandel Claret. div 4, sec M

275 Kitzmuller, M.: 3 top Barouches, 1 Open do., Grocery Wagon, 3 Phaetons, 2 Sidebar Buggies, 1 Piano Top-Buggy, 1 Extension do. div 2, sec S & T

276 Foye, W. H.: Franklin Rotary Plow. div 7, sec Z

Brass and Tile Fenders, Brass and Iron Nolla Mosaics, Lustro for Polishing. div 2, sec Y & Z, gal

289 Walcom, G. W.: Hansen's Improved Sofa-Bed, Household Treasure, Adam's patent Pillow Sham Holder. div 3, sec K, gal

290 Retchler, F.: Indianapolis Chair Manufacturing Co., Indianapolis Chair Manufacturing Co.'s Sofa Bed. div 4, sec G, gal

291 Fuller, Geo. H.: The Californian Desk, the Office King, Child's patent Folding and Fuller's Stationary-top School Desk, Globes, Maps, Charts, Blackboards, Rattan, Furniture. div 4, sec U & V, gal

292 Hayes, Thos.: One Worsted Picture. rm 3, gal

293 Kirkland, J. B.: One Photograph—all one Piece. art gal

294 Wilson, Mrs. T. A.: Patent Spool Holder. rm 3, gal

295 Harwood, Capt. Wm.: Patent Dredger. div 8, sec S

296 Harold Jr., Joha & Co.: Samples Empire Extract of Malt. div 3, sec U

297 Ewing, Geo.: 2 Milk Wagons. div 2, sec V

298 Berry & Place: 5 Gardner Governors. div 7, sec I & J

placed at a price that every household can have one. As it deserved, it attracted a great deal of attention and favorable comment while performing its work of making ice.

313 Hawkins, Thos.: Compound Rotary Engine. div 8, sec Q

314 Anderson & Green: Device for Turning Curves with Cable Cars. div 3, sec Q

315 Tant, Mrs. T. W.: Piece of Embroidery. rm 3, gal

316 Baker, C. H.: Mining Horse Power. div 4, sec Y

317 Dye, Eland: Sectional Ladder Fire Escape. div 5, sec F

318 Woolsey, I. S.: Patent Self-Discharging Gopher Trap. div 6, 3ec Q

319 Dunlan, Thos.: Tenoning Machine. div 2, sec Q

320 Akin, Wm.: Automatic Advertiser. div 6, sec N

321 Wilke, Miss F.: Crochet Mat. div 1, gal

322 Holmes, H. C. & Bogart: Grapple for Submerged Piles. div 3, sec Q

323 Parker, J. M.: Japanese and India Goods, L. P. M. Tea. div 5, sec V

324 Kohler & Chase: Showcase Musical Instruments. div 6, sec V and W

PROFILE OF STREET GRADES OF SAN FRANCISCO CABLE RAILROADS.

255 Woodin & Little: 2 Pumps. div 2, sec X

256 Baer, Mrs. Eliza: 4 Crayon Drawings by Emilie Baer. art gal

257 Ray, W. S. & Co.: Elmwood, Hudson, and "Our Choice" Ranges, and Stamped Ware. The Only Stove known to have left Mikado's Palace. Our own Manufacture as Follows: Ship, Steamboat and Yacht Stoves, Lanterns and Ranges, and all kinds Ship Furniture, Fog Horns, Gongs, Sounders, Fire Clay, Fire Brick, Tiling, Hollow Ware, Crude Plumbago, Stove Polish, Lubrication, Patent Egg Carrier, div 2, sec G & H

This display deserves special mention on account of the variety and excellence of the stoves, ranges, etc., on exhibition. This enterprising firm is located at No.'s 12 and 14 Market street, San Francisco.

258 Van Schaick, Mrs. R.: 2 Patchwork Quilts. div 1, sec M, gal

259 Van Shaick, L. H.: 2 Newspapers, "*Ulster County Gazette*," of 1800; and "*Pennsylvania Gazette*," of 1761. rm 3, gal

260 Johnson, Capt. H., U. S. A.: 2 Oil Paintings. art gal

261 Woolhouse Bros.: Sunlight Gas Machine. div 4, sec V

262 Smith, Capt. B.: Display of Californaia Invention for Competition. div 3, sec I

263 Touite Powder Co.: Showcase of Samples. div 3, sec H

264 Seymour & Sahin: Threshing Machine —"Minnesota Chief." div 4, sec X

265 Vulcan Powder Co.: Showcase of Samples. div 3, sec H

277 Tatum & Bowen: 4 Light-drop Continuous-feed Lubricators,—on Ohmen Engine, Garret Pump and Hinckle Elevator, Hall's pat. Valve Engine, Electric Light Engine,—Albany Labricating Compound and Cups. div 8, sec R

278 Hendy, Joshua: Wilhraham patent Rotary Piston Pump. div 8, sec P

279 Osborn & Alexander: Barnes' Foot-Power Machinery. div 7, sec G

280 Hill, Samuel: New Home Sewing Machine. div 3, sec N, gal

281 Hawley, M. C.: 4 Dodd's Rakes, 1 Holliagsworth do. div 1, sec W & X

282 Gressle, Heary: Specimens of Wood Carving.

283 Hanford, John: Plant's patent Amalgamator. div 7, sec R

284 Brinkmann, G. F. E.: Quartz Crusher aad Pulverizer. div 8, sec V

285 Montague, W. W. & Co.: Display of American Barh Fence Wire. div 6, sec Q

286 Richmann, H.: Richmann's Rock Drill and Air Compressor. div 8, sec T

287 Clark, Truman S. & Son: 4 Clark's patent Iron Bedsteads, with Woven Wire Matresses, 4 Woven Wire Matresses, 2 patent Foldiag Camp Cots, 2 Burr patent Parlor Folding Beds, 1 patent Kitchen Cabinet, 2 Hair Mattresses. div 4, sec F, gal

288 Montague, W. W. & Co.: Encaustic Hearth Tile, Glazed and Eaameled Tile, Plain Mosaic Tile, Art Painted do., Brass and Tile Mantels, Marbleized Iron Mantels,

299 Brownlee, Mrs. F. C.: Samples of Needham's Red Clover. rm 3, gal

300 Mersereau, A. S.: Express Wagon, Milk Wagon, patent Top-Buggy. div 8, sec D

301 Durose, F. F.: Inlaid Box—4027 pieces made during his leisure hours. rm 3, gal

302 Robinson & Hallidie: Barh-Wire Machine and Manufactures. div 7, sec J

303 Cancelled.

304 Watts, N. C.: Floating Dry Dock. div 7, sec O

305 Coppage, J. W.: Frame of Samples of Button Holes. div 3, gal

306 Manlock, Miss Jennie: Tatting Quilt, 2 Shams. div 1, sec H, gal

307 Torelli, P.: Patent Sewer Trap. div 7, sec O

308 Jones, Mrs. E. F.: Bed Spread, 2 Shams, String Buttons. div 1, sec J, gal

309 Dear Woo: Landscape and Oil Painting. art gal

310 Phillips, Capt. W. A.: Apparatus for Turning Curves in Cable Roads. div 3, sec Q

311 Rhodes, Miss Lou: 5 Table Mats. rm 3, gal

312 Gelett, C. W.: Hand Ice Machine. div 6, sec L

This was a new and novel machine which demonstrated a fact that every family can have new made ice daily. Experimental tests made each day proved this machine capable of making the best quality of ice in 40 minutes. This machine is not complicated, but is simple in construction. Any one can handle it, and it is

325 McDonald, E. M. & Co.: S. R. Matthewson's Patent Circular Rotating Cam, and Straight's Stamp Quartz Mill. div 7, sec U

326 Matthewson, S. R.: Device for carrying Cable Cars around Curves. div 6, sec R

327 The Goodwia Gas Stove and Meter Co.: Gas Stoves. div 6, sec J

328 Truworthy, F. M.: Stencil Plates. div 1, gal

329 Boone & Osborne: Display of Patents. div 3

330 Bradt, Mrs. Helen: Porcelain Paintiag. rm 3, gal

331 Newell, E. C.: The California Refrigerator. div 6, sec R

This was an exhibit of three refrigerators, designed according to size for family and hotel use. They were aa improvemeat on those used in Boston for over 30 years. The ice-chamber is so arranged that there is maintained a free circulation of dry air, keeping provisions cool and free from taiat. The best material is used, are fiaished ia the highest style of workmaaship, and are an ornament to any room. In this climate these refrigerators are a necessity, and are sold at a price that places them within the reach of every household. With a view to economy these refrigerators ean be stocked with iee at a cost of from five to tea cents per day, resulting in a saviag in ice and provision enough to pay for one yearly. Factory and office, 1128 and 1130 Sacramento street.

332 Harvey, C. D.: Hot Water Furnace and Radiators for heating Buildiugs. div 6, sec H

334 Leary, Dan.: Coasting Sleigh. div 6, sec R

335 Colmesnil, J. G.: Ostrich Robe. div 1, gal

336 Domett, E. M.: Display Blanchard's Foods. rm 3, gal

337 Sanders & Co.: 2 Bottoms of Steam Kettles for Philadelphia Brewery. div 9, sec J

338 Snow, John T.: Waterproof Crape, etc. div 5, sec B, gal

339 Schroeder, Wm.: Inlaid Work. div 1, sec N, gal

340 Pacific Coast S. S. Co.: Model of Steamer *State of California*. div 3, gal

341 Parke & Lacy: 1 Hook & Ladder Truck. div 8, sec G

342 Norserey, M.: 1 Model of Mining Camp. div 3, gal

343 Lick Observatory: Miniature Dome. div 3, gal

344 Locke, Hale & Co.: Patent Steel Horse Shoes. div 6, sec R

345 Martin, Mrs. Sarah: Ironing Board. div 3, sec R gal

346 Mitchell, Geo. H.: Magic Lotion. div 3, sec R, gal

347 Harvey, C. D.: Hot Water Furnace and Radiator. div 6, sec L

348 Hinkle, Philip: Patent Air and Water Compression Chamber, Elevators. div 6 & 7, sec Y

349 Williams, Harlock & Co.: Soldering Machine. div 7, sec O

350 Wolff & Bodley: Eldridge and Williams Sewing Machines. div 3, sec Q, gal

351 Womens' Social Science Association: Fancy Work. div 1, sec L, gal

352 Woodward, Wm.: Display Curios. div 1, sec E & F, gal

353 Goodrich & Co.: Taylor Stoves & Ranges, American Coffee Pots. div 1 & 2 sec K

354 Gumpertz & Brooks.: Decorators. div 4, sec O, gal

355 Goodall, Perkins & Co.: S. S. *State of California*. div 1, sec I, gal

356 Fedemeyer, L. P.: Hair-work Likeness. div 1, sec J, gal

357 Fowzer & Co.: Scenic, Backgrounds. div 2, sec Y and Z, gal

358 Fruit Display by Mechanics' Fair. div 6, sec E

359 Elms, John: Dolly Varden Carpet. div 1, sec N, gal

360 Erdins: Patent Kitchen Table. div 3, sec L, gal

361 Drouilhat, J.: Billiard Tables. div 6, sec F

362 Cal. Electric Light Co.: Engine. div 7, sec R

363 Cal. Iron Co.: Samples of Iron. div 6, sec T

364 Clark, G. W.: Window Shades, Interior Decorations. div 5, sec B, gal

365 Cook, J. J.: Photo of Indians. div 1, sec O

366 Sloss, Louis & Co.: Leather Hides. div 6, sec R

367 Runyon, Mrs. Sol.: Display of Preserved Jellies, Home-made. sec U, gal

368 Wood, Wm. Harrison: Folding Bed. div O, sec 3, gal

369 Fowlar, Wm.: Model of a Ship. rm 3, ga

370 Brown, Richard: Flying Machine. div 8, sec C

371 Morrow, Jno. B.: Aerial Steamer.

372 Mayo, Mrs. H.: 1 Frame Wax Flowers 1 Harp, Wax. rm 3, gal

Patent, Nov. 11, 1879,
Patent, Nov. 9, 1880.
Medical Electricity.

HORNE'S ELECTRO-MAGNETIC BELT.
(The Only Genuine.) Received 1st *Premium State Fair.* Electro-Magnetic Belts, New Style, $10; Electro-Magnetic Belts, Extra Appliance, $15; Electro-Magn. Belts, 9 Improvements, $20 GUARANTEED ONE YEAR. BEST IN THE WORLD. Will positively cure without medicine—Rheumatism, Paralysis, Neuralgia, Kidney Disease, Impotency, Rupture, Liver Disease Nervousness, Dyspepsia, Spinal Disease, Ague, Piles and other diseases. Send for illustrated catalogue, free. Also

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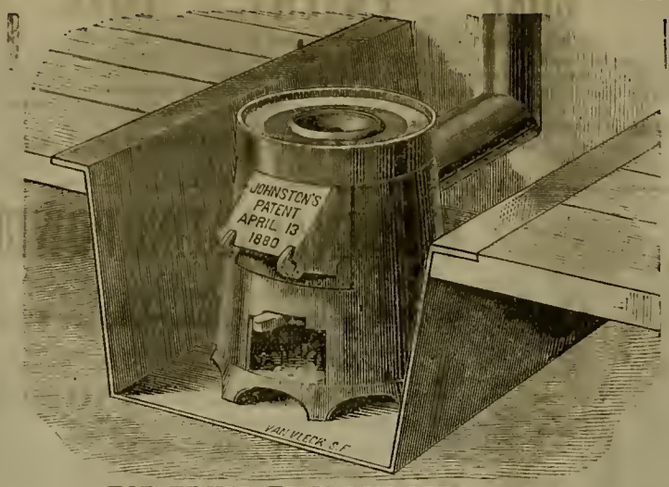
JOHNSTON'S IMPROVED SOLDERING APPARATUS.



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This apparatus is presented to the trade with the assurance that it possesses many points of superiority over any other machine now in use. Its capacity is very great, and the quality of work is much superior to hand-soldering, and more certain in the production of tight seams. A single movement of the operator adjusts the can and applies the solder to the entire length of joint, and a like movement removes the finished work and leaves the apparatus ready for the next can. The solder is applied at one operation to the whole joint, and from the outside only, so that no acid or rosin is used on the inside of the can. In a day's work of ten hours, it will finish both ends of 3,000 fruit cans or 2,000 gallons cans. It will cap 5,000 salmon cans in the same time, and will give much better results than can be obtained in hand capping. It can be run all day with thirty-five pounds of hard coal. Address, J. J. JOHNSTON, PATENTEE, 561 Minna St., S. F. Cal.

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TONITE NEVER FREEZES!

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It is Always Ready for Use, as well in the Coldest Regions as the Tropics.

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Consolidated Virginia Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Virginia Mining District, Storey County, State of Nevada.

Notice is hereby given that, at a meeting of the Board of Trustees, held on the twenty-second (22d) day of August, 1881, an assessment, (No. 16) of Thirty (30) Cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, 309 Montgomery street, Room 25 (Nevada Block), San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-fourth (24th) day of September, 1881, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on Saturday, the twenty-second (22d) day of October, 1881, at the hour of eleven (11) o'clock A. M., at the office of the Company, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

A. W. HAVENS, Sec'y.

OFFICE—Room 25, No. 309 Montgomery street (Nevada Block), San Francisco, Cal.

The Oxford Beta Tunnel and Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Aurora, Esmeralda County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the Twentytieth (20) day of August, 1881, an assessment, No. Twenty nine (29), of Twenty (20) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Rooms of Dr. Krowles, 113 Dupont street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the Twenty-sixth (26) day of September, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the Seventeenth day of October, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. H. PECK, Sec'y.

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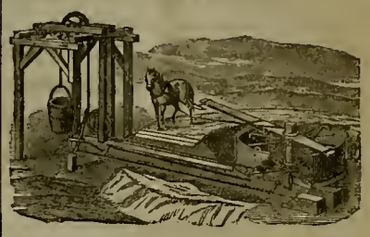

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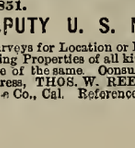

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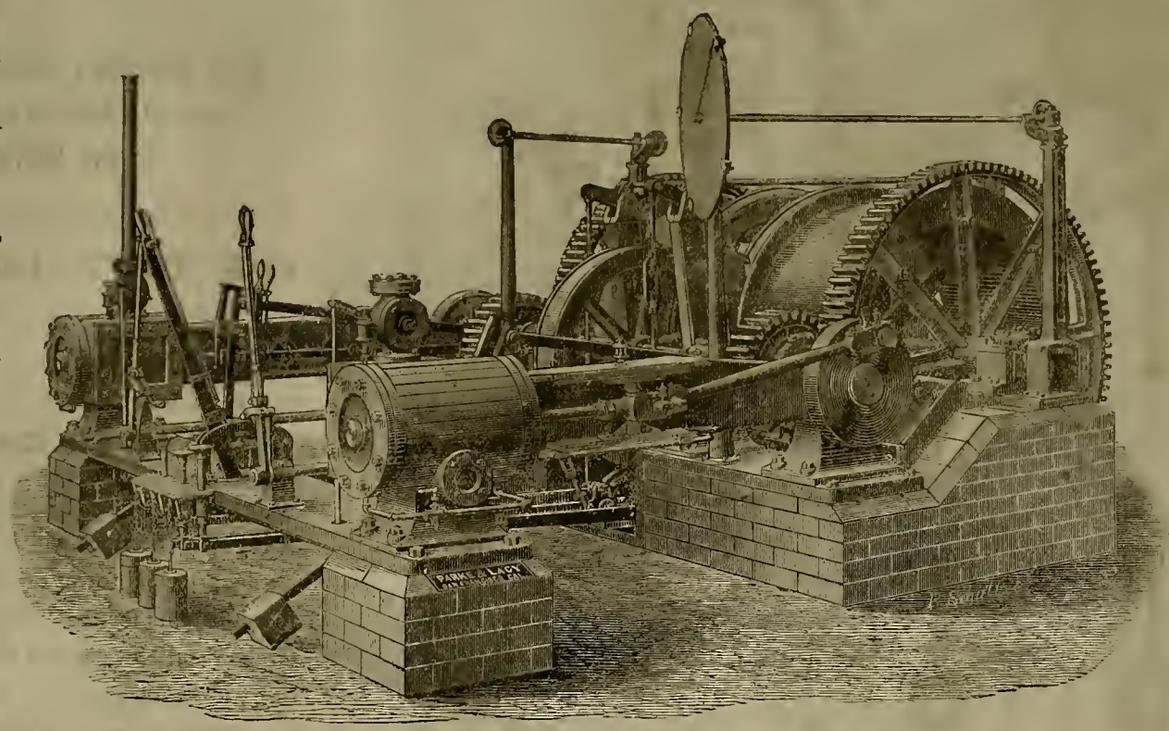

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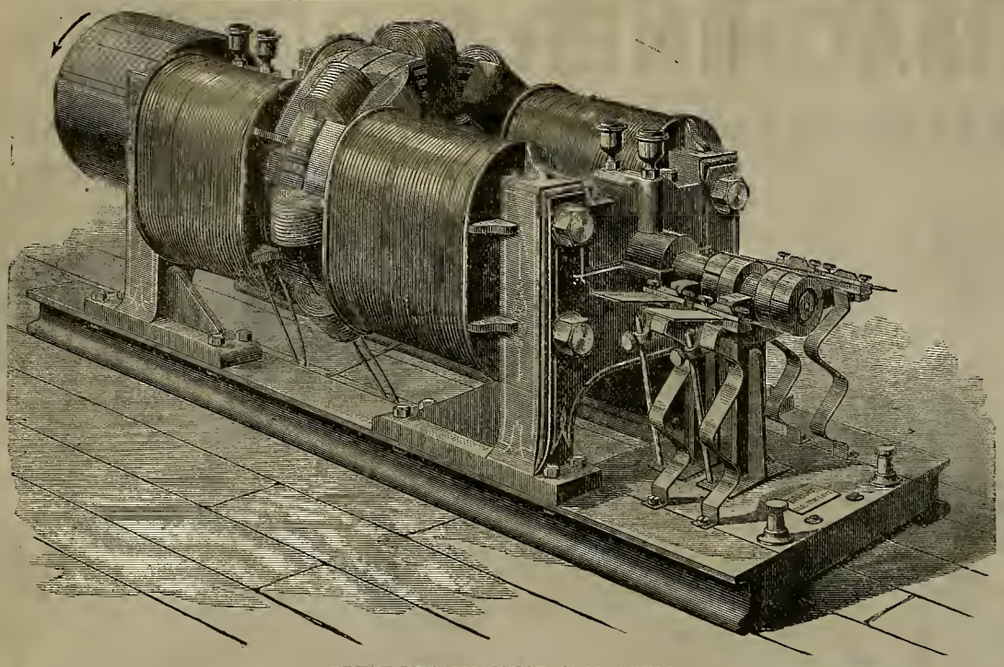

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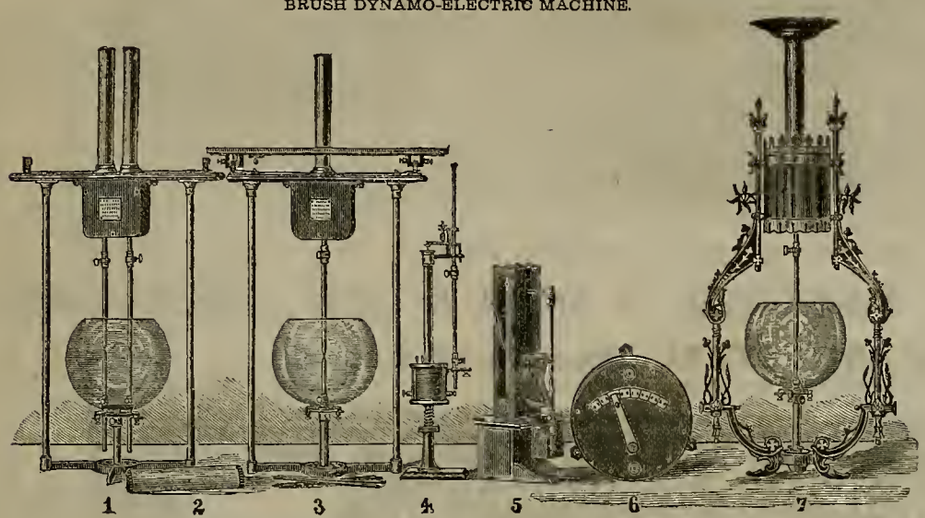

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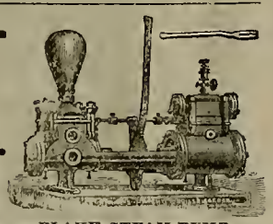

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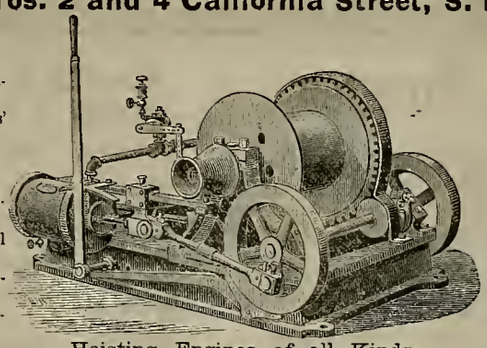

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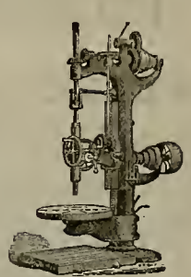

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SAN FRANCISCO, SATURDAY, SEPTEMBER 10, 1881.

VOLUME XLIII Number 11

The Mica Veins of North Carolina.

To those who have mica veins and there are many on this coast, the following paper read hy W. C. Kerr, State Geologist, Raleigh, N. C., hefore the American Institnte of Mining Engineers, will prove of interest. The paper is worthy of preservation as showing the mode of occnrrences of tho veins and other characteristics of those famons mica mines:

A hrief sketch only is here intended, with a few illustrations, in order to give a general notion of the character and structnre of these veins. I have stated elsewhere, several years ago, that theso veins were wronght on a large scale and for many ages hy some ancient people, most prohably the so-called Mound Builders; althongh they hnilt no monnds here, and have left no signe of any permanent habitation. They opened and worked a great many veins down to or near water-level; that is, as far as the action of atmospherio chemistry had softened the rock so that it was workahle without metal toole, of the nse of which no signs are apparent. Many of the largest and most profitahle of the mines of the present day are simply the ancient Monnd Builders' mines reopened and pushed into the hard undecomposed granite by powder and steel. Blocks of mica have often been fonnd half imhedded in the face of the vein, with the tool marks abont it, showing the exact limit of the efficiency of those prehistorio mechanical appliances.

As to the geological relations of these veins, they are found in the gneisses and schists of the Archæsn horizons, in that snhdivision which I have provisionally classed as npper laurentian, the montalban of Dr. Hnnt. These rocks are of very extensive occurrence in North Carolina, constitnting in fact the great hody of the rocks throughout the whole length of the State—some 400 miles east and west—heing partially covered np, and interrnpted here and there hy helts of later formation. Mica veins aro found here, in fact may he said to characterize this horizon everywhere, from its eastern outcrop, near the seahoard, to and qnite nnder the flanks of the Smokey mountains. It ie, however, in the great plateau of the west, hetween the Blue Ridge and the Smokey, that the mica veins reach their greatest development, and have given rise to a very new and profitahle indnstry —new and at the same time very old.

It may he stated as a very general, almost nniversal, fact, that the mica vein is a hedded vein. Its position (as to strike and dip) is dependent on and controlled hy, and qnite conformable to, that of the rocks in which it occurs, and hence, as well as on acconnt of their great size, some oheervers, accustomed to the study of veins and dikes and the characters of intrusive rocks in other regions, have heen disposed to question the vein character of these masses at first. Bnt a good exposure of a single one of them is generally snfficient to remove all douht on this score. The mica vein is simply and always a dike of *very coarse granite*. It is of any size and shape from a few inches—generally a few feet—to many rods (in some cascs several hnndred feet in thickness, and in length from a few rods to many hundred yards, extending in some cases to half a mile or more). The strike, like that of enclosing rocks, is generally northeaet, at a pretty high angle; hnt they are snhject, in these respects, to many and great local variations, all the oonditions being occasionally changed or even reversed.

An idea may he formed of the coarseness of these veins from this statement that the names of cleavahle feldspar and of qnartz (limpid, pale yellow, hrown, or more generally slightly smokey) and of mica, are often found to measnre several yards in two or three of these diminsions, and weighing several tons. I have a feldspar from one of these mines of nearly a thonsand lbs. weight, and I have known a single hlock of mica to make two full horse wagon loads, and sheets of mica are sometimes ohtained that measure three or four ft. in diameter.

There are many peculiarities about these veins. Among the most important, in a practical sense, is the arrangement of the different constitnents of the vein *inter se*. Sometimee the mica, for example, will he found hngging the hanging wall; sometimes it is found against hoth walls; again it may he distrihnted pretty eqnally throngh the whole mass of the vein; sometimes, again, it will he found collected in the middle of the vein. In other cases where the vein varies in thickness along its conrse, the mica will be found in bnnohes in the ampnllations or bellies of the vein. In still other oases where the vein has many vertical embranchments, the mica will he found accnmnlated in nests along the upper faces of these processes or offshoots. These features of structure will he best nnderstood from a few representative diagrams.

Fig. 1 is a horizontal section, with several transverse vertical sections, of a typical vein in Yancey county, at the Presnel mine. The length of the section, *i. e.*, of the portion of the vein that has been stripped, is 125 ft.; the thickness varies from 3 to 10 ft., except at a few points, as *b*, *c*, where it is nearly 20 ft.

DIAGRAM SHOWING SECTIONS OF MICA VEINS OF NORTH CAROLINA.

The crystals of mica are found in this mine generally near the foot wall, in the recesses or ponohes; at *c*, however, as seen in section *D.*, it is fonnd next the hanging wall.

The inclosing rock in this case is a hard, gray slaty to schietose gneise. The relation of the vein to the topography is seen in Fig. 2.

Another characteristic vein is well exposed at the Point Pezzle mine, in the same county, which has heen wronght very snccessfnlly for several years. (Fig. 3).

The inclosing rock is the same as in the former oase. The mica here is found mostly next the haoging wall, and also in the offshoots or branches of the vein, as shown in the vertical section at *d*. This vein illustrates the exceeding irregularities whioh are often fonnd in these intrusive masses—irregularities in form, size and position—and the force with which the enclosing rooks have heen crowded and hent and split in the effort of the vein matter to insert itself. The vein is 40 ft. thick at *b*, and 1 to 2 ft. at *c*. Fig. 4 fnrnishes another illnstration of the same points.

Another class of veins is represented hy the accompanying cross-section of one of the largest and most prodnctive veins, on which was opened the first mica mine in this region (Sink Hole), in the bottom and top, with heavy forest trees of the age of 300 to 400 years. Fig. 5.

The lower part of the diagram represents an enlarged cross-section of the vein at *b*. The wall rock, 1, 1, is a soft, decomposed micaschist. A horse, of this wall rock, is imbedded in the body of the vein on hoth sides, 1, 1. At 3, 3, occnr interpolations of smokey quartz, and next to this, on hoth sides, at 4, 4, moet of the best mica is found, thongh occasional masses of marketahle mineral are fonnd throughont the vein, at 5, and 2, 2. In the side vein, however, (*a*) the mica is fonnd mainly in the middle.

The extent and value of the mica indnstry may be indicated hy some statistics of this single mine. The vein has been worked ont to water level for nearly half a mile, and it is estimated that the aggregate length of its tnnnels is more than six miles, and the yield of marketahle mica above 40,000 lbs.

In preparing the blocke of mica, splitting and cutting to the forms and sizes demanded hy the markets, there is a waste of nine-tenths to nineteen-twentieths, even in a good mine.

The feldspar, which constitntes the larger part of the mass of these veins, is often fonnd converted into heds of the finest kaolin; and, cnrious enongh, this was one of the first and most valuahle exports to England in the early part of the 17th centnry, "packed" by the Indisns ont of the Unaka (Smokey) monntains, and sold under the name "nnakeh" (white). This kaolin, like the mica, will donhtless soon come again into demand, after lying forgotten for generations.

These are only a few of the more prominent characteristics of these very interesting veins. I have not referred to their singular richness in rare minerals, as samarskite, uraninite, gummite, allanite, etc., nor to many curions and nnexplained relations hetween the marketahle character of the mica,—size, color, pnrity, fissility, etc.,—and the special matrix in which the hlocks are imhedded. I do not know a hetter region for the study of the etructure and origin of veins in general.

About 15 miles from the Silver King mine in Calico mountain, San Bernardino connty, in the crater of an extinct volcano, an immenee hot epring has heen discovered, sufficient to fill a 6-inch pipe with water, and plans are heing made for carrying the water to the Silver King mine. This will fnrnish power for rnnning their 20-stamp mill.

A good many prospectore, says the *Territorial Enterprise*, are now sconting ont among the hills. It will he a difficnlt matter to find anything within a mile or two of this city that ie not already claimed.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

The Mining Interest in New York.

[From our Regular Correspondent.]

EDITORS PRESS:—During the past few weeks the market for mining shares in this city has been very unsettled and feverish, with prices for the stock of the mines quoted in San Francisco, of course following the fluctuations in your market, which is undoubtedly destined to remain for an indefinite period the ruling center for mining interests.

Speculation in the Comstock, Bodie and Eureka shares has been much less active than in the favorite wildcats of this market—the latter being chiefly located in Arizona, Colorado and Idaho. Last week the transactions at the two mining boards are reported as having aggregated 88,381 shares, an increase of about 200,000 shares over the business of the preceding week. The mining stock handled in the New York Stock Exchange is, as a rule, of much greater intrinsic worth and stability than that sold in the boards which are devoted to the transaction of mining sales exclusively, as the regular exchange is some what more particular in its scrutiny of the stocks proposed for listing, and besides, charges fees which rule out the weakest of the wildcats. The business of the Stock Exchange is not included in the figures given above, but it amounts to a considerable proportion of all the mining sales effected here.

Of the 88,381 shares changing hands, I do not suppose that one-fifth were of mines which appear on the lists of the San Francisco boards; and of the remainder, I fear it would be unsafe to say that they have anything like a real equivalent in value.

Mining speculation here is a much blinder, wilder, more irrational procedure than was ever the mania for stock gambling in San Francisco. And it is conducted on principles so entirely dissimilar to the ideas in vogue on the Pacific coast as to lend an air of intense ludicrousness to the whole matter. In San Francisco the whole system appears to hang upon the finding or prospective finding of ore as a means of getting up a stock "deal," and after a "deal" has occurred few of the old habitues of Pine and California streets bother themselves much about dividends. Here the situation is entirely reversed. The floating of wildcats is given an air of most intense respectability, and the buyers of the stock are invariably promised, on the good faith of the promoters, dividends in the immediate future—not profits so large and glittering as to frighten the conservative New Yorkers, but placed at a nice, enticing, good interest figure.

I do not wish to be understood as affirming that all the mining business of New York is a hoax and a swindle. Such is not at all the case. But the sad truth is that much and irreparable harm has been done to the legitimate industry by the methods prevalent here—and of these latter none is so insidious and harmful as the very practice of dinning this word "legitimate" into the ears of the innocent. Better far to have the mining exchanges operated as a reputable means of gaming (as was for so long a time the case in San Francisco) than to have them become dingy monuments of broken pledges and disappointed hopes, founded on what purported to be an honest, business-like system.

While I am on this subject, let me quote just one example of how the thing is done here. The instance came under my notice quite recently. It was this: A stock company had been formed to operate what I presume to have been anything but a good property—and the presumption rests upon the fact that if, as the promoters advertised in their very elegant and alluring prospectus, the profits were to be so speedy, so certain and so lasting, there would have been just a little too much pure benevolence in offering to divide them with the unknown public, in view of the fact (as stated) that little or no expenses were to be incurred in placing the mine upon a paying basis. For, to tell the truth, one cannot help being just a trifle suspicious of the New York "promoter" when he appears in the character of an auriferous or argentiferous philanthropist. Now, with whom do you suppose this charitable division of the proceeds was to be made? With capitalists, business men, bankers, brokers, or any men of the class? By no means. The good will of the organizers was so far supplemented by their discrimination, that they proposed to let in all the poor and needy and persons of moderate means. To this end they obtained from the lists of the commercial agencies the names and addresses of all the clergymen, lawyers, physicians and other professional men, as well as all the school teachers, boarding-house keepers, etc., of the gentler (and more credulous) sex, and to each one of this happily-selected assortment of possible stock-buyers mailed a copy of the seductive prospectus. Ought not promoters having so critical appreciation of the relative gullibility of the various classes of humanity succeed well in floating their project? I hear that they did.

There is one thing to be said in favor of the manipulators of the San Francisco stock market—whatever may be their shortcomings as considered from a fine-drawn, moral point of view, they nevertheless have never been accused of any practices to be compared with the one just quoted, or many others which men here, otherwise considered respectable and fair-dealing, stoop to when they turn their attention to placing mining properties on the market.

On the other hand, it is to be recorded with pleasure that not a few shrewd New Yorkers, more, probably, than is generally supposed, have managed to get control, recently, of profitable mines, and are reaping large returns from their investments. During the past year, a large number of fairly good mines in Arizona and Idaho have passed into the hands of men here, and, although mining, as generally conducted under "tenderfoot" management is apt to be a failure, still, enough good results have been shown to disabuse the watchers of the exchanges of the idea that all mining is necessarily disastrous, from the investors' standpoint. In fact, the enterprise of some of the heavier operators, who go in for securing mines to work for their own profit, and not merely as a basis for some scheme of gulling the public, has been such, that in certain districts they have entirely cut out San Francisco, Virginia City and Salt Lake buyers. They have reliable experts constantly traveling through the newly discovered mining districts, who, by being on the spot at the proper time, are enabled to secure promising prospects by the payment of ready cash—a much more economical method than that of bonding mines after they have been entirely developed, and in a condition to sustain themselves. This, indeed, has been the method of one of the heaviest and most successful of the California syndicates. I mean the one controlling the Standard, Ontario, Custer, Homestake and other well-known dividend mines. They have bought largely, have made many ventures, but on the whole very cheaply, and in fact seem to have acted upon the right system of mine purchase.

Dividends.

One of the local authorities states that the mining dividends paid by the gold, silver and copper mines of the United States during the last six months amounted to $6,244,250, which is $40,950 less than was paid the year previous. Since January 1st, only 40 mines have paid dividends. The States and Territories containing the mines contributing these dividends are as follows:

Location.		Location	
California	$998,000	Colorado	$962,000
Nevada	791,250	Montana	240,000
Utah	375,000	Michigan	1,410,000
Arizona	900,000	Georgia	8,000
Dakota	560,000		
Totals			$6,244,250

You will be surprised, perhaps, to learn that of the dividend payers, Michigan takes the lead with the Calumet and Hecla copper mine. California follows with the Standard gold mine. In Nevada the principal mines are the Eureka and Richmond; and in Arizona the Contention and Silver King are the chief producers.

Bullion Shipments to New York.

Another point of interest, as showing that New York has really some claim to the title of a mining center, if not *the* mining center, is that the amount of bullion sent hither for sale or for refining is on the increase. Last week the bullion receipts aggregated $258,184, and often this amount is exceeded. As a rule this bullion comes direct from the mines and reduction works, and is not re-handled bullion. And generally it is from mines owned or controlled here.

A Gradual Subsidence in Mining Operations

Has undoubtedly taken place since the lamentable breaking down of some of the Leadville favorites last year; but it by no means follows that all interest in mines has ceased. On the contrary, it appears that recently renewed attention has been brought upon the subject, and that there is a decided prospect for an increase in the near future in the volume of business, founded, it is to be hoped, upon a change for the better in the methods practiced and consequently in the results obtained. The most weighty reason for this belief is the fact that at present, and probably for some time to come, there is and will be great difficulty is securing satisfactory rates of interest upon capital advanced in the slower channels of enterprise. Very many of the heavier capitalists have been driven to accepting as low as 4% on their investments. Mortgages upon real estate, if the security is unexceptionable and the amount large, rarely bring more than 5%, and sometimes less. The stocks and bonds of the profitable railway companies, if nominally paying a high rate of interest are held at such a figure that the actual return, as calculated upon their market value, is quite low. This is also true of State securities, and even the low interest bearing paper of the National Government commands such a price that the annual returns to the bondholder are brought down to figures corresponding to those ruling in England and Germany. The result is that the incomes of many are lowered to a point very unsatisfactory in comparison with what they were only a few years since; and as a natural sequence there is now a vast amount of capital, in the aggregate, seeking more profitable application than in the ordinary local investments. Besides this consideration, it must be remembered, that during the past two years of general prosperity throughout the Eastern States fortunes have been accumulated, and these new accretions of capital have to be used in some way. Thus it is not only the people of moderate means who look toward mining investments as a means of bettering their condition, but also the more wealthy classes, who who are in a measure driven to search for something more remunerative than railway or manufacturing securities.

A Marked Increase in Discrimination

Is to be noted in the views of the New Yorkers on mining matters. They are learning, one by one, the tricks of unscrupulous manipulators, and are really acquiring a certain amount of intelligence as to the value of mining properties and modes of operating them. If the experience has been bitter, the results are salutary. In course of time there will be as many good judges of a mining proposition here as elsewhere. It is to be admitted that there is still much to be desired in this direction, and that the process of education is a slow one. However, there is no reason why New York business men, who are proverbially shrewd about other things, should not also acquire a successful insight into the mysteries of mines as well. The ultra "tenderfoot" notions are certainly becoming much modified.

During last winter and spring an unusual number of tourists from this part of the country, who had made pilgrimages to California, were attracted to the mining camps from a mixed impulse of curiosity and monetary interest. This ought to have a beneficial effect upon their preconceived ideas of mining, and has doubtless been the cause of a considerable addition to the capital actively employed in conducting the industry. PAUL WARD.

New York, August 13, 1881.

Operating and Lubricating Air Compressors.

EDITORS PRESS:—In the MINING AND SCIENTIFIC PRESS, of July 16th, I read your notice of Grigby's system of lubricating and operating air compressors, all of which I would confirm by saying, that in these mines we have formerly had much difficulty and expense in repairs, and consequently a great deal of lost time, working our compressor on the old style. Nine months ago we put Grigby's improvement on our compressor, which is a double cylinder 16-inch bore, and from that moment we haven't had any delay or the least difficulty in any way. The lubrication is perfect; the insides of the cylinders are as bright as a mirror. Not a particle of rust or corrosion anywhere. The wear is reduced to almost nothing at all. The same leathers that have been in constant use for over nine months on the valves are still perfectly good, and to all appearances will last for many months to come. The consumption of oil is less than half of what it was by the old system; consumption of water not over one-thousandth of what was required by the old system, or 1 to 1,000. The steam cylinder on the machine will furnish plenty of condensed water from the bibb cocks alone to run two such compressors. By this new device our saving per year will exceed the following figures:

On oil, one year's saving	$150
On fuel, one year's saving	550
On water, one year's saving	800
On lost time and repairs for one year	1,000
Giving us a yearly saving of	$2,500

Which, although it may seem incredible, nevertheless is under rather than over the proper amount, and this is for one compressor alone.

With the perfect lubrication which is secured by Grigsby's invention, the operation of which is positive, the wearing parts are kept smooth and in perfect order, thereby, as any mechanic well knows, making a great saving in power. The apparatus is simple and durable, no difficulty attending it, and the attendant can see at any time exactly how much lubricant is constantly entering the cylinders, and the quantity can be decreased or increased to any desired amount, and the expense is not increased in the least by so doing, as there is no loss. This improvement will do all and more than is claimed for it. I consider it worth as much to any person using a compressor, as the first cost of the compressor. The right to use it could not be purchased away from this company; we feel we could not get on without it. Any person desiring information can address R. F. Grigsby, care of Thannhauser & Co., 311 California street, San Francisco. Arrangements will soon be made to supply all parties on the Pacific coast with this valuable invention. JAMES BAIN, Chief Engineer.

Iago Mines, Sinaloa, Mexico, Aug. 12, 1881.

Glencoe District, Calaveras County.

EDITORS PRESS:—It has been some time since I have attempted to add a few lines to the columns of the MINING AND SCIENTIFIC PRESS, ever replete with sterling knowledge and mining news of interest to the Pacific States; but I will endeavor to do better hereafter.

Mining news to be useful as general information, and to the locality it emanates from, should be descriptive of visible facts simply; or at the least based on unquestionable authority. But veracity itself would be regarded with suspicion if clothed with visionary anticipations and predictions, whether feigned, sincere or caused by ignorance of the subject.

This mining district of Glencoe is situated some 10 miles northeast of Mokelumne Hill, bounded northwest by the south fork of the Mokelumne river and Amador county, by Railroad Flat district easterly, and southerly by Rich Gulch district.

The prominent country rocks are slate and soapstone, the schistose formation predominating. A narrow belt of granite, trending north and south, can be traced near the eastern boundary. The larger number of the quartz veins carry ore from 3 to 10 ft. wide—the average value of unassorted rock being low grade, but easily extracted, gold amalgamating freely in milling, with but one exception.

The Glencoe is located in the granite belt mentioned, and is probably the most remarkable mine in this county, where argentiferous ore is almost unknown. The lode crosses the South Fork at a right angle, the Woodhouse, Boston and Lone Star being located upon it to the north, and although those mines have been now and then successfully worked for many years, no argentiferous ore has ever been met with in them. The Glencoe is situate on the south side of the South Fork. Two tunnels, driven to the south on the vein, and a 10-stamp mill run by water power constitute the principal improvements. The lower tunnel shows a large quantity of low-grade ore, but has not yet reached the ore body found above. The ore in the upper tunnel is extensive, containing a large percentage of argentiferous galena. The recent product of the mine is at the rate of one-third silver and two-thirds gold. Through the kindness of Mr. J. J. Holmes, manager of the mine, I am permitted to extract from a letter written by Mr. E. C. Voorhies, superintendent of the Amador Reduction Works, who chlorinated several tons of poorly concentrated sulphurets from the Glencoe: "If your sulphurets were concentrated, as done by improved machines now in use, they would be worth from $400 to $500 per ton, and I could then obtain 97% of fire assay. The lot worked yielded 92½% of fire assay. At a low and safe estimate I think that your ore would yield $40 per ton from sulphurets, independent of the free gold. The small lot of ore (assorted) sent contains 11.68% of sulphurets and assays $467.10 per ton." Mr. Holmes is now selecting concentrating machinery, to be added to the Glencoe mill. He intends to have the concentrations worked at Sutter.

Space taken up by the above in your columns bids me to close. I will try to give you a synopsis of each prominent mine in this section if the owners or managers will facilitate the collection of facts, corroborated by the writer's eyes. S.

Glencoe, Calaveras Co., Aug. 30, 1881.

California Mining Industry.

The Chico *Chronicle* realizes the importance of the mining industry when it says: From the red hot discussion now going on in the papers that have taken up the subject of debris from the mines, one would suppose that mining had become an interest wholly antagonistic to the welfare of the State; and some even go so far as to assert that mining is comparatively of no importance to the prosperity and wealth of the community. The papers published in the mining sections, however, convey a totally different impression to the reader. In Siskiyou, Trinity, Shasta, Plumas, El Dorado, Nevada, and some portions of Butte, the accounts of the yield of the precious metals are still on the same magnificent scale as in the days of '49-50. We read in the Yreka *Journal* of a gravel claim which yields $2,000 per day, and is owned by three Americans and five Kanakas. Also, of astonishing yields from quartz crushing in all the counties mentioned. We have concluded, after reading a few of these mining county papers, that there must be a large population still engaged in this occupation and that the farmers, merchants, and transportation companies are in a great measure dependent on successful mining for their patronage. At any rate, should this spoke in the wheel of fortune be suddenly taken out, many of our people would find their business ceasing to be profitable, and would be compelled to seek their livelihood in other lands.

A New Dodge.

"Talk is cheap," but in the earlier and less palpable stages of bummerism and deadbeatism it is sometimes profitable, says the Homer *Index*. For instance, let two or three "retired miners" (retired from work) go into Bodie and lay claim to a large interest in some valuable outside mining property that is being rapidly developed by muscle and money, and let them add that the rascally company owning and developing such property owes them (the retired miners) large sums of money besides, and for which they intend commencing suit and attaching the property at once—let them attend faithfully to these details, and their summer's grub and their summer's supply of whisky is assured—and of course no one would expect them to work during the long and inclement winter. The same means of obtaining a livelihood may also be resorted to with some degree of success in Lundy, or in any other camp, so that care be taken not to attempt the game in the same camp where the accused company is operating. The co-operative plan also works admirably in this line of business—that is, by having a separate set of bummers in two different camps at once co-operating against the same property or company in a third camp.—*Bodie Free Press.*

THE Excelsior hydraulic mining company at Smartsville, are building, at a cost of from $50,000 to $75,000, a dump that it is expected will hold the tailings from their claim for two years to come.

MECHANICAL PROGRESS.

Increasing the Use of Iron.

The Belgian Commission of Inquiry into means for increasing the use of iron, which was appointed in 1877, has lately issued its report. For the better consideration of the subject it has been divided into seven classes; namely, engineering construction, buildings, mining, railway stores and fixed plant, railway rolling stock, naval construction, military material and buildings.

Almost the only suggestion which is made under the first heading, is that of substituting iron columns for stone piers in bridge-building; whilst, in place of wood, iron screw piles are recommended for pile foundations, and iron for bridge roadways, as being both stronger and cheaper than wood. Reference is made to the employment of iron in marine piers, wharves, etc. The report urges its use in buildings wherever possible, especially in all those liable to fire, in which latter case iron floors, staircases, girders, etc., should be obligatory. Doors, shutters, roofing, laths, etc., might also be constructed of this material.

For the lining of pit-shafts iron is considered by the Commission to possess advantages, as in this manner the dimensions of the shaft would be reduced. In some cases it might replace wood in the permanent galleries; and there are many other purposes for which iron might be employed in mining work, to the exclusion of wood, and the obviation of its many disadvantages.

On the question of iron vs. wooden sleepers, the report refers to the increasing preference given to the former, especially in Germany; but the Commission appears not to have had sufficient information before it to arrive at a decision. The Minister of Public Works has been requested to furnish a report on the subject.

On the question of naval construction, the opinion expressed is, that for vessels under 500 or 600 tons, wood is the cheapest material; whilst, as larger vessels are almost exclusively constructed of iron, no extension of its employment in this direction is suggested. For military purposes iron might be much more largely used than at present.

Practically, it would appear that the Commission offers scarcely any original suggestions for the employment of iron. Many of the points mentioned in the report have already been, to a great extent, successfully adopted; whilst, on the most important point touched upon—that of iron vs. wooden sleepers—the Commission discreetly refrains from expressing an opinion. Taken as a whole, it must be admitted (from the report) that its work is hardly likely to produce any practical result; but it may possibly lead to a more thorough consideration of the question, and thus attain some measure of usefulness.—*Engineering.*

USING GRINDSTONES.—A journal devoted to carpentry and building gives the following directions for using and keeping in order a grindstone used for hand tools:—Place across each end of the frame a block of wood, say 2x4 inches in size, beveled to suit the desired pitch for plain iron chisels, etc.—the beveled face to incline toward the stone. The iron to be ground is held face side down upon the beveled block with either the right or the left hand, as the case may be, the other hand turning the stone. Whenever the stone becomes glazed by turning one way, change hands and turn the stone in the opposite direction, or it may be turned backward if preferred. When the stone gets a little out of true, I change the handle one-quarter of the way around. If the stone is even grit, this will cause it to work true again. It is really a luxury for me to grind by this method, so much so that, although I have steam power which I run part of the time, I seldom employ it for grinding. It happens that I am usually otherwise occupied when power is running; hence the convenience of the method which I describe.

IMPROVEMENT IN STEAMSHIPS.—The old Cunard steamship, *Persia*, was one of the finest steamships afloat, in her days; yet she required six tons of coal to carry a ton of freight across the Atlantic in her. To-day the steamer *Arizona* is carrying freight across the Atlantic with a consumption of only one-fifth of a ton of coal to a ton of freight. It is mainly by the reduction in the quanity of coal consumed that we estimate the progress made in the improvement of steamers during the last 40 years.

NEW TINNERS' TOOL.—A Bristol, Tenn., mechanic is said to have invented a valuable machine for tinners, that will supersede the square, circular shears and dies now used, which cost $800. The new machine can be run with great rapidity by foot power, as well as by steam and the inventor thinks it can be furnished for $200. The machine is on exhibition at Bristol, and attracts much attention among machinists and mechanics.

STEEL BELTING.—A patent recently granted in Vienna and Berlin uses bands of steel, which is tempered and hardened, to transmit motion from one pulley to the other, the faces of the pulleys being turned perfectly flat and then faced with a varnish of rosin, shellac and asphalt.

Lubricants.

The desirable features of a good lubricant or unguent may be briefly stated thus: It should, first of all, reduce friction to a minimum, should be perfectly neutral, and of uniform composition. It should not become gummy or otherwise altered by exposure to the air, should stand a high temperature without lose or decomposition, and a low temperature without solidifying or depositing solid matters. The question of cost and adaptability to the requirements of light or heavy bearings are also important considerations.

The finest lubricating oils in the market—those used for watch, clock, and similar delicate mechanism—are chiefly prepared from sperm oil by digesting it in trays, with clean lead shavings, for a week or more. Solid stearate of lead is formed, and remains adhering to the metal, while the oil becomes more fluid and less liable to change or thicken on chilling.

Sperm oil is used for lubricating sewing machines and other light machinery. Some of the oils sold for this purpose contain cotton seed oil and kerosene, and others are composed largely of mineral, sperm, or signal oil—a heavy, purified distillate of petroleum.

Good heavy lubricating oil is made from heavy paraffine oil (a distillate of petroleum). Owing to the decomposition of the vapors of the heavy distillate into lighter products, which takes place in the still, the crude oil contains a large per cent of light offensive oils, too thin for lubricating purposes. These are separated by blowing superheated steam through the oils, heated just short of its boiling point in the still, the lighter oils being driven off, a neatral, nearly odorless, heavy oil remaining. When mixed with good lard oil it makes an excellent and cheap lubricant.

Common heavy shop and engine oils are commonly variable mixtures of heavy petroleum or paraffine oils, lard oil, whale or fish, palm, and sometimes cotton seed and resin oils. There are nearly as many of these composite oils in the market as there are dealers in such supplies.

The formulas of over 40 different preparations have been given, from time to time in the various technical journals which come to our table.

A New Fire-Brick.

A new manufacture has recently sprung up in England, and one which, according to *Iron*, promises well for those who have embarked in it. This is the manufacture of fire-bricks from flint, at works which have lately been started at Charlton, Kent, by the Thames Flint Fire-brick Co., of which Mr. E. R. Salway is the manager. The bricks are manufactured under Mr. Henry Edward's patent, the process of manufacture being as follows: The flint stones are first thoroughly calcined in special furnaces constructed for the purpose. The calcined flint is then transferred to a fixed pan, in which revolves a pair of heavy-edge runners. The limestone is also burned in a kiln in the usual manner and deposited in a tank, into which water is introduced, and the burnt lime is there partially dissolved. The water, in which the lime has been partially dissolved, is run into another tank, and there allowed to settle, and a proportion of the lime deposits at the bottom of the tank. The lime water is conveyed by pipes to the pan of the edge-runners in which the flint has been deposited, enough lime water being introduced to moisten the flint sufficiently for a thorough mixing. The revolving runners grind and thoroughly mix the mass, taking about a quarter of an hour for each charge of one ton of flint and lime water.

When the mass has been ground and mixed sufficiently for the purpose for which it is intended, it is removed from the pan through a sluice in the bottom. The plastic composition thus formed may be at once molded into bricks, but it is improved and brought to better temper by being kept for a few hours before molding, which plan is usually adopted. The molding, drying and baking processes are effected in the manner usual in the manufacture of the Dinas fire-brick or stone fire-bricks generally. The fire cement is brought into fit condition for sale by drying the plastic compound after it leaves the pan, and regrinding it when dry. It is then ready to be packed in bags or casks for the market. By this method of manufacture fire goods are produced which consist of nearly pure silica, and which are stated to be quite as capable of resisting intense heat as the Dinas fire-bricks, if not more so. These bricks have been tried in various steel and iron works, furnaces developing intense heat, including the Siemens' regenerative furnaces, and the results in all cases are reported to be most satisfactory.

HARD PUTTY.—The *Carriage Monthly* gives the following for a hard putty that will dry in one day: Take the whitening, mash all the lumps out on the stone, and mix into a stiff paste by adding equal parts of japan and rubbing varnish; then add as much keg-lead as you think will make it work free with the knife; then add the rest of the whitening until you have it to suit you. This will sand-paper good with one day's drying. If you want putty that will dry quicker, take dry white lead and mix with equal parts of japan and varnish, to which add a few drops of turpentine. This is very soft for putty, but can be sand-papered in from 2 to 3 hours, it becoming perfectly hard in that time.

SCIENTIFIC PROGRESS.

Measuring Mind.

A curious device has recently been invented by Dr. Mosso, of Turin, which is designed for the measurement of the force of mind as developed in the act of thinking. It is called the plethysmograph, and its revelations are based on the fact that thought creates nervous action, which consumes in its performance a certain quantity of blood, and that quantity may be measured. In an address before the American association of Paris, Prof. G. F. Baker describes the machine and its working as follows:

The forearm, for example, being the organ to be experimented on, is placed in a cylinder of water and tightly closed. A rubber tube connects the interior of the cylinder with the recording apparatus. With the electric circuit by which the stimulus was applied to produce contraction, were two keys, one of which was a dummy.

It was noticed that, after using the active key several times, producing varying current strengths, the curve sank as before on pressing down the inactive key. Since no real effect was produced, the result was caused solely by the imagination, blood passing from the body to the brain in the act.

To test further the effect of mental action, Dr. Pagliani, whose arm was in the apparatus, was requested to multiply 267 by 8, mentally, and to make a sign when he had finished. The recorded curve showed very distinctly how much more blood the brain took to perform the operation.

Hence the device is capable of measuring the relative amount of mental power required by different persons to work out the same mental problem.

Indeed, Mr. Gaskell suggests the use of the instrument in the examination room, to find out, in addition to the amount of knowledge a man possesses, how much effort it causes him to produce any particular result of brain-work.

Dr. Mosso relates that, while the apparatus was set up in his room in Turin, a classical man came in to see him. He looked very contemptuously upon it, and asked of what use it could be, saying it couldn't do anybody any good.

Dr. Mosso replied: "Well, now, I can tell you by that whether you can read Greek as readily as you can Latin."

As the classicist would not believe it, his whole arm was put into the apparatus, and he was given a Latin book to read. A very slight sinking of the reserve was the result.

The Latin book was then taken away, and a Greek book was given to him. This produced immediately a much deeper curve.

He had asserted before that it was quite as easy for him to read Greek as Latin, and that there was no difficulty in doing either. Dr. Mosso, however, was able to show him that he was laboring under a delusion.

Experiments have also been made to show that this apparatus is so sensitive as to be useful for ascertaining how much a person is dreaming—how much effort is employed in the act.

YELLOW FROM RED AND BLUE.—Lord Rayleigh described a plan for demonstrating that yellow color can be formed by combining red and blue. He mixes a red solution of chromate of potash with a blue solution of litmus, and, on filling it into a glass cell of a certain thickness, the light transmitted through it is seen to be yellow. Plates of glass coated with gelatine impregnated with chromate of potash, placed side by side with plates coated with gelatine impregnated with litmus, also transmit yellow light. Lord Rayleigh finds, however, that the eyes of different persons vary considerably in their power of appreciating the tinge of the transmitted yellow; but this has nothing to do with color-blindness, since all the persons tested could distinguish at once the components with accuracy.

PROGRESS OF CHEMICAL INDUSTRY FOR THE FIRST QUARTER OF 1881.—The number of coloring matters have been again considerably increased. Andinon and Wegnelin have prepared an improved aniline black from a mixture of aniline and one-half xylidine or cumidine. A beautiful violet color has been prepared from an ammoniacal solution of sulphate of copper and yellow prussiate. Majert's process relates to the preparation of a blue color. Salzmann and Kruger have obtained a patent for the preparation of red, violet and green colors. The woody matter of heath and of poplar trees yield, according to Savigny and Colineau, a yellow dye which they name ericine.

SCIENCE IN FLOWER CULTURE.—A gardener at Naples holds out the hope that in the near future the camellia will rival the rose in fragrance as well as in beauty. After years of experience he has succeeded in producing a camellia with a delicate perfume. It is of a pale rose color, and the gardener hopes to obtain before long fragrant white blossoms.

THE TELEPHONE UNDER WATER.—*L'Ectricite* states that M. Dohrn has introduced the telephone in connection with his scientific explorations of the bed of the Bay of Naples. By its use the diver and the boatmon overhead are able to communicate with each other quickly and intelligibly.

Is There a Luminiferous Ether?

According to the commonly received theory in regard to light and heat, all space must be filled with some subtle kind of fluid, which has been usually termed a luminiferous ether. Now, it has occurred to Mr. Albert A. Michelson, a master in the United States navy, that if such is the fact, when the earth is moving through the ether, while the latter is at rest, the time required for lights to pass from one point to another on the earth's surface would depend on the direction in which it travels. It will be greater when the light travels in a direction opposite to that of the earth, and shorter when they move in the same direction.

To prove that such is the fact, Mr. Michelson has devised an ingenious apparatus, so as to permit two pencils of light, which have traveled over paths at right angles to each other, to interfere; the pencil which has traveled in the direction of the earth's motion will in reality travel 1-100 of a wave-length faster than it would have done were the earth at rest. The other pencil, being at right angles to the motion, would not be affected.

Mr. Michelson had his apparatus constructed in Berlin, but it was found to be so sensitive to vibrations, that observations could only be carried out at night, and stamping on a pavement at a distance of 30 ft. from the Potsdam observatory caused the pencils to disappear entirely from the field of vision of the telescope.

Mr. M. has, however, made a series of experiments, and comes to the conclusion that the hypothesis of a stationary ether is incorrect. The conclusion directly contradicts the explanation of the phenomenon of aberration which has hitherto been generally accepted, and which presupposes that the earth moves through the ether, the latter remaining at rest.

THE SPEED OF THOUGHT AND THE SENSES.—Some interesting experiments have recently been undertaken by European scientists, to demonstrate the speed of thought along the various nerves of the human body, and also the speed of the several senses. Helmholz has shown that a wave of thought would require about a minute to traverse a mile of nerve, and Hirsh found that a touch on the face was recognized by the brain, and responded to by a manual signal in the seventh of a second. He also found that the speed of sense differed for different organs, the sense of hearing being responded to in a sixth of a second, while that of sight only required one-fifth of a second to be felt and signalled. In all these cases the distance traversed was about the same, so the inference is, that images travel more slowly than sounds or touch. It still remained, however, to show the portion of this interval taken up by the action of the brain. Prof. Donders, by very delicate apparatus, has demonstrated this to be about .7500 of a second. Of the whole interval, .4000 are occupied in the simple act of recognition, and .3500 for the act of willing a response. When two irritants were caused to operate on the same sense, 1-25 of a second was required for the person to recognize which was the first, but a slightly longer interval was required to determine the priority in the case of the other senses. These results were obtained from a middle-aged man; but in youths the mental operations are somewhat quicker than in the adult. The average of many experiments proved that a simple thought occupies 1-40 of a second.

TWINKLING OF THE STARS.—Recently M. Montigny has written again on the increase of the twinkling of stars when there is a display of the aurora borealis. The increased scintillation is seen all the more clearly on winter than on summer nights, and the phenomenon is more apparent when stars in the northern region are observed. The author thinks the effect is not due to the direct influence of the electro-magnetic light of the aurora on the scintillation itself, but to disturbances (probably a cooling) which coincide in time with the appearance of the aurora in the upper regions of the air traversed by the star rays.

EFFECTS OF INTELLECTUAL WORK ON THE BRAIN.—What are the effects of different kinds of intellectual work on the cerebral circulation? This question M. Gley, a French physiologist, has attempted to answer by experiments made upon himself. When he applied himself to a subject which he had a difficulty in understanding thoroughly, and had, therefore, to concentrate all his energies upon it, the rhythm of the heart was far more accelerated than when he took up some matter with which he was well acquainted.

REPORTED LITERARY DISCOVERY.—An important and hitherto unknown treatise by Copernicus, on the movements of the celestial bodies, has been discovered in the archives of the astronomical observatory at Stockholm. This treatise is said to fill a very valuable place among the writings of the great astronomer. There is no doubt as to its genuineness, as it is soon to be published and given to the world.

DIGESTION.—R. P. Chittenden is inclined to the belief that in the stomach there are two stages of digestion, separate one from the other—a first, in which the action of the saliva can go on without hindrance, and a second, in which pepsin alone is active,

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 18		Week Ending Aug. 25		Week Ending Sept. 1.		Week Ending Sept. 8.	
Alpha	4¼	3.85	4.40	4¼	4	3.55	3¾	....
Alta	4.35	4.10	4.15	3.80	4.05	3.90	4.80	4.40
Andes	1.40	1	1.30	1.15	1.20	1.05	1.60	1.05
Albion	2.10	1.80	1.90	1.55	2	1.70	2.20	1¾
Argenta	....	....	....	....	....	....	....	....
Addenda	30c	15c	30c	25c	25c	20c	20c	15c
Belcher	3¼	2.90	3.30	3.10	3.05	2.80	3	2.60
Belmont	....	....	....	....	....	....	....	....
Beet & Belcher	13	10¾	13¾	12¾	13¾	11¾	12¼	11¾
Bullion	70c	50c	1.45	70c	1.20	1.10	1.15	80c
Bechtel	1.30	1	1.15	1.05	1 30	1	1.05	80c
Bel Isle	20c	15c	20c	....	20c	....	15c	....
Bodie	10¼	7¾	9¾	8¾	9¾	9	9¾	9¼
Benton	1	95c	1	85c	95c	90c	95c	85c
Bulwer	3¼	3	....	....	2¾	2.40	....	....
Boston	30c	25c	....	....	....	....	20c	10c
Black Hawk	30c	5c	25c	20c	25c	20c	15c	....
Belvidere	50c	....	50c	....	....	....	....	....
Booker	....	....	....	....	....	....	5c	....
Caledonia	40c	30c	45c	40c	35c	30c	30c	25c
California	1.05	90c	1.10	1	1.05	1	95c	90c
Challenge	95c	90c	95c	90c	80c	....	80c	....
Chollar	3.10	2.15	3.05	2¾	2¾	2.30	2¾	2.20
Confidence	4¼	4¼	4¼	4	3.95	3¾	3¾	....
Con Imperial	20c	15c	20c	15c	15c	10c	15c	10c
Con Virginia	2.35	1.50	2 30	2	2.05	1.90	1.95	1.85
Crown Point	2¼	2	2¼	2.10	2.10	1.90	2.15	1.90
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1.60	1½	....	....	1¾	....	....	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	70c	50c	75c	60c	60c	40c	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2¼	2	2.45	2¼	2.35	2¼	2.30	2.15
E. Mt. Diablo	15c	....	15c	....	20c	15c	20c	15c
Eureka Con	29	28	....	....	28	26¼	28	27
Exchequer	1¼	1.10	1.30	1.10	1.35	1.15	1¼	1.05
Endowment	....	....	....	....	....	....	....	....
Grand Prize	15c	10c	15c	....	30c	5c	50c	35c
Golden Gate	2.80	2¾	....	....	2¼	....	2¼	....
Goodehaw	65c	55c	65c	60c	55c	35c	....	....
Gould & Curry	7¾	4.95	7¾	6¼	7¾	6¾	7¾	6¾
Hale & Norcross	4.35	3.30	4.40	3.80	4.20	3.80	4.05	3¾
Head Center	1	....	1	....	....	....	1	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	40c	30c	45c	35c	45c	40c	40c	35c
Justice	90c	80c	85c	75c	80c	75c	75c	70c
Jackson	....	....	75c	....	....	....	....	....
Jupiter	20c	15c	25c	....	20c	10c	....	....
Kentuck	3	2¾	3	2.10	2.10	2	2	1.60
Keesuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	20c	....	15c	....	....	....	20c	15c
Lewisthan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	30c	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2	....	1½	....	2	....	1½	....
Martin White	....	....	30c	20c	25c	....	50c	....
McClinton	20c	....	10c	....	10c	....	....	....
Mono	4.00	2.65	3.90	3.75	3.80	3¼	4	3.55
Mexican	9¼	8¾	11¾	10¼	10¼	9¼	10¼	9¾
Mt. Diablo	7	6¼	....	....	6	....	6¾	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1.40	1.10	1.55	1	1	90c	90c	80c
New York	20c	10c	20c	10c	15c	10c	....	....
Northern Belle	15¾	14¾	15¾	14¾	15	15¼	17¼	16¾
North Noonday	90c	55c	70c	55c	65c	....	60c	....
Navajo	55c	....	55c	....	40c	....	....	....
Occidental	2	1¾	1.80	1¾	1.90	1¾	1¾	....
Ophir	6¾	5¾	7¾	6¾	6¾	6¾	6¾	6¾
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.40	1.05	2	1.20	1.90	1¼	2	1¼
Oro	70c	45c	50c	45c	50c	45c	60c	40c
Paris	40c	....	25c	....	....	....	....	....
Potosi	3¼	2.55	3.35	3	3.20	2¾	3.30	3
Green Bee	10c	....	5c	....	5c	....	....	....
South Bulwer	80c	25c	....	....	....	....	....	....
Savage	3¼	2.40	3.85	3.10	3.30	2.90	3.30	2¾
Seg Belcher	5	5	6¾	....	5¾	5	8	6¾
Sierra Nevada	13¾	8¾	17	13¾	17	13¼	16¾	14¾
Silver Hill	20c	10c	15c	....	15c	10c	10c	....
Silver King	20¾	20	20¾	20	20¼	19¾	19	18¾
Succor	....	....	....	....	....	....	....	....
Summit	50c	25c	....	....	25c	....	25c	....
Scorpion	1¾	1.35	1.80	1.15	1.70	1¼	1.70	1.55
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	10c	....	5c	....	....	....	5c	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	30c	45c	50c	....	45c	40c	45c	....
Tioga Con	1.05	40c	45c	35c	40c	....	40c	25c
Tiptop	6	5¾	6¾	5¾	6	5¾	5¾	5¾
Tuscarora	25c	20c	....	....	....	....	....	....
Union Con	12	9¾	14¾	11¾	14¾	10	13¾	12¾
Utah	11¼	8¾	11¾	10	11¾	9¾	10¾	9¾
Ward	2¾	....	....	....	....	....	....	....
Wales	80c	60c	75c	60c	75c	60c	90c	80c
Yellow Jacket	6¾	4.95	6¾	5¾	6	5¾	5¾	4.60

Sales at S. F. Stock Exchange.

Thursday A.M., Sept. 8.

480 Alta 4¼
100 Andes 1.60
180 B & Belcher ..... 12@12¼
230 Belcher 2.65
400 Bullion 85c
500 Benton 90c
45 California 90c
920 Con Virginia ..... 1.85@1.90
350 Chollar ..... 2@2.45
400 Con Imperial 10c
50 Confidence ..... 3?
50 Challenge 80c
180 Exchequer ..... 1.10@1.05
950 Gould & Curry ..... 7¾@7¾
100 Hale & Nor 3.80
200 Justice 70c
10 Julia 35c
200 Lady Wash 15c
235 Mexican ..... 10@10¼
385 Ophir ..... 6¾@6¾
310 Overman ..... 1.85@1.90
855 Potosi 3.20
1520 Sierra Nevada ..... 16¾@16¾
70 Savage 2.80
10 Seg Belcher 7
50 Scorpion 1.65
150 Utah ..... 10¼@10¾
1085 Union ..... 13@13¼
445 Yellow Jacket ..... 4.90@4.85

AFTERNOON SESSION.

185 Albion ..... 1.85@1.90
100 Addenda 20c
20 Boston 25c
700 Black Hawk ..... 20@15c
270 Bodie ..... 8¾@9
100 Bodie Tunnel 2¼
300 Bechtel ..... 95@90c
500 Day 2.20
70 Eureka Con ..... 28@27¾
20 M White 60c
275 Mono ..... 3.55@3.60
100 Mt Diablo ..... 6?
100 N Bello Te 30c
100 Navajo 50c
5 Northern Belle 16
100 Noonday 75c
933 Oro ..... 40@45c
200 Pinal 2
500 Syndicate 45c
50 Summit 10c
50 Tiptop ..... 5?

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Head Center, September 3d, $7,015; Navajo, 5th, $4,000; Northern Belle, 3d, $13,014.40; Bodie Con., 5th, $6.833; Northern Belle, August 31st, $8,511.25; Western, 30th, $12,035.03; Mack Morris, 27th, $5,267; Ontario, 28th, $5,414; Horn Silver, 28th, $7,500; Barbee & Walker, 28th, $2,050; Germania, 28th, $4,000; Hanauer, 28th, $2,050; Great Basin, 28th, $2,870; Jay Gould, 28th, $1,605; Hanauer, 31st, $860; Bullion, 30th, $5,350; Ontario, 30th, $14,500; Horn Silver, September 1st, $7,500; Barbee & Walker, 1st, $2,123; Germania, August 31st, $3,100; Hanauer, 31st, $4,060; Star, 31st, $1,580; Ontario, September 2d, $7,950; Horn Silver, 2d, $20,000; Wood River, 2d, $6,375; Germania, $1,650; Stormont, 2d, $3,315; Hanauer, 3d, $1,895; Germania, 2d, $2,000; Horn Silver, 4th, $20,000; Barbee & Walker, 4th, $2,629; Frisco, 3d, $3,606.

ONLY white labor is employed at the Nortb Bloomfield mines.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argenta M Co	Nevada	9	10	Sept 5	Oct 7	Oct 28	F M Hall	327 Pine st
Alta S M Co	Nevada	21	50	Aug 2	Sept 6	Sept 26	W H Watson	302 Montgomery st
Albion Con Co	Nevada	8	40	Aug 1	Sept 5	Sept 26	D B Chilehlm	327 Pine st
Bullion M Co	Nevada	20	80	July 21	Aug 25	Sept 15	J M Brazell	328 Montgomery st
Belmont M Co	Nevada	29	15	July 27	Aug 30	Sept 26	J W Pew	310 Pine st
Chollar M Co	Nevada	6	50	Aug 29	Sept 20	Oct 21	W E Dean	309 Montgomery st
Con Amador	California	2	1 00	Aug 3	Sept 6	Sept 24	F B Latham	328 Montgomery st
Con Imperial	Nevada	16	10	Aug 22	Sept 27	Oct 18	W E Dean	309 Montgomery st
Con Virginia M Co	Nevada	16	30	Aug 2	Sept 24	Oct 22	A W Havens	309 Montgomery st
Crown Point G & S M Co	Nevada	45	75	Sept 7	Oct 12	Nov 2	Jas S Newlands	327 Pine st
Grand Prize M Co	Nevada	6	25	July 30	Sept 8	Sept 29	E M Hall	327 Pine st
Independence M Co	Nevada	8	16	Aug 25	Sept 26	Oct 17	E M Hall	327 Pine et
Juniata Con M Co	Nevada	5	04	Aug 16	Sept 19	Oct 8	C V Hubbard	310 Pine st
Kentuck M Co	Nevada	16	50	Aug 22	Sept 26	Oct 17	A J Stuart	234 Montgomery et
Meadow Valley M Co	Nevada	16	30	Aug 1	Sept 10	Oct 4	H DeLaguna	414 California st
Mono M Co	California	13	50	Aug 6	Sept 12	Oct 3	W H Lent	309 Montgomery st
Mt Potosi M Co	Nevada	7	15	Aug 12	Sept 17	Oct 10	J H Sayre	330 Pine et
Murchie G & S M Co	Nevada	7	15	Sept 7	Oct 11	Nov 10	Wm Letts Oliver	328 Montgomery st
Occidental Con Gravel M Co	California	8	06	Aug 22	Oct 3	Oct 26	W T Smith	414 California et
Oneida M Co	California	15	3 00	July 21	Aug 23	Sept 20	H P Bush	431 California st
Overman M Co	Nevada	50	150	July 20	Aug 24	Sept 14	G T Edwards	414 California et
Potosi M Co	Nevada	6	50	Aug 29	Oct 4	Oct 25	W E Dean	309 Montgomery et
Seg Belcher M Co	Nevada	19	1 00	Aug 3	Sept 6	Sept 27	G D Edwards	414 California st
Silver Hill M Co	Nevada	10	25	Aug 16	Sept 19	Sept 10	W E Dean	309 Montgomery st
Tioga Con M Co	California	14	20	Aug 16	Sept 22	Oct 12	W H Lent	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M Co	California	3	15	Aug 22	Sept 22	Oct 10	J M Buffington	309 California st
Alpha Hydraulic M Co	California	3	25	Aug 20	Sept 27	Oct 18	J Ireland	216 Sansome st
Bengal M Co	Arizona	1	02	Aug 31	Oct 7	Oct 29	J H Sayre	330 Pine st
Defiance G M Co	California	6	05	Aug 26	Sept 30	Oct 20	W H Lent	309 Montgomery st
Delano M Co	California	2	03	Aug 13	Sept 16	Oct 7	J Morizo	328 Montgomery st
East Noonday M Co	California	2	05	Aug 2	Sept 8	Sept 24	C V Hubbard	310 Pine et
Golden Fleece M Co	California	22	40 00	July 28	Sept 3	Sept 22	Fr Schirmeier	785 Folsom et
Harrington M Co	California	2	05	June 15	Sept 14	Oct 4	O C Muller	409 California st
Iowa M Co	Nevada	14	05	July 27	Sept 12	Oct 5	C S Leavitt	411½ California et
Lodi M Co	Nevada	3	05	July 19	Aug 22	Sept 12	A B Paul	328 Montgomery st
Lodi M Co	California	3	05	July 19	Aug 22	Sept 12	A B Paul	328 Montgomery st
May Flower G M Co	California	12	10	July 19	Sept 7	Sept 28	J Morizo	328 Montgomery st
Morgan M Co	California	7	50	July 6	Aug 15	Sept 13	J Raphael	533 Kearny st
New Bacel Con Gravel M Co	California	—	10	Aug 25	Oct 1	Oct 20	F X Simon	525 Commercial st
New York M Co	Nevada	26	10	July 16	Aug 18	Sept 6	D L Thomas	327 Pine et
North Gould & Curry G & S M Co	Nevada	1	25	July 5	Sept 15	Oct 12	M C Southard	331 Montgomery st
Navajo M Co	Nevada	2	25	Aug 19	Sept 22	Oct 13	J W Pew	310 Montgomery st
Oro M Co	California	9	25	Aug 16	Sept 21	Oct 12	W Stuart	320 Sansome et
Oakland M Co	California	16	05	July 30	Aug 31	Sept 19	R D Hopkins	436 Montgomery st
Peahody G M Co	California	1	04½	Aug 31	Oct 3	Oct 21	R D Hopkins	317 Montgomery et
Santa Anita M Co	California	1	13	Aug 20	Sept 25	Oct 10	J B Titus	34 Kearny st
Sherwood M Co	Nevada	3	06	Aug 11	Sept 19	Sept 10	J M Buffington	309 California st
South Hite M Co	California	2	10	Sept 1	Oct 5	Oct 29	T A Berlin	515 California st
Spaulding G & S M Co	California	2	10	June 28	Sept 23	Oct 21	J W Pew	310 Pine st
University G M Co	California	3	10	Aug 15	Sept 20	Oct 12	Wm. L Oliver	326 Montgomery et
Western Home Con M Co	Idaho	2	05	Aug 15	Sept 26	Oct 26	A Halsey	328 Montgomery tt

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Booker Con M Co	California	W H Lent	309 Montgomery st	Annual	Sept 28
Dudley M Co	———	C V D Hubbard	310 Pine st	Annual	Sept 13
Flowery M Co	Nevada	W W Stetson	309 Montgomery st	Annual	Sept 20
Graud Prize M Co	Nevada	E M Hall	327 Pine et	Annual	Sept 20
Hill Side M Co	California	F Frankenthal	330 Pine et	Stockholdere	Sept 19
May Belle Con M Co	California	W J Taylor	310 Pine st	Stockholdere	Sept 12
Lodi M Co	Nevada	A B Paul	328 Montgomery st	Annual	Sept 10
Mint M Co	California	H H Haskell	528 California st	Annual	Sept 23
Northern Belle M & M Co	California	Wm Willie	309 Montgomery st	Annual	Sept 12
North Bonanza M Co	Nevada	W W Steteon	309 Montgomery et	Annual	Sept 20
Swamp Angel G M Co	California	Lewis Lillie	607 Washington st	Stockholders	Sept 15
Tellurium G & S M Co	———	J M Litchfield	419 Montgomery st	Annual	Sept 29
Tuscarora M & M Co	Nevada	M E Sperling	309 California et	Annual	Sept 14

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Aug 27
Father De Smet M Co	Dakota	H Dean	New York	50	June 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Aug 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Aug 15
Silver King M Co	Arizona	J Nash	315 California st	25	Aug 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Aug 12
Tip Top M Co	Arizona	H Deas	309 Montgomery st	20	Aug 25
Western M Co	California	C S Curtiss	309 Montgomery st	75	Sept 8

The Mining Share Market.

There is notbing very new to report about mining stocks. They bave not been very lively. Up on tbe Comstock nothing startling has happened.

Work will be resumed in the Savage next week at several points under very favorable circumstances. Henceforward the work of exploration in the mine will proceed uninterruptedly.

Excellent progress is making in all the preparatory work in the honanza mines, and soon they will be in a position to begin active explorations on several levels.

The hydranlic pump still continues to work satisfactorily, taking all the water sent to it, and there is now nothing to prevent the thorough opening (hy crosscuts) of the 2400-level of the middle mines. The Chollar and Potosi folks will doubtless start crosscuts as soon as they have completed the snh-drain in their main drift.

The following statements show the financial condition of some of the big companies ou the 1st inst:

Bullion — Receipts, $61,812.36; disbursements, $49,412.65; cash on hand, $12,399.71; due Ward Company, $102,866.66; due Sutro tunnel, $3,295.96.

Best & Belcher—Receipts, $45,301.41; disbnrsements, $24,971.61; cash on hand, $20,-329.80.

Consolidated Virginia—Receipts, $3,257.65; disbursements, $18,194.61; indebtedness, $92,-086.80.

California—Receipts, $118,173.86; disbnrsements, $21,276.55; cash on hand and in bank, $1,511.37; hullion on hand, $1,111.27.

Gould & Curry—Receipts, $50,868.68; disbursements, $22,852.29; cash on hand, $29,-938.99.

Hale & Norcross—Receipts, $55,312.25; disbursements, $40,686.59; cash in bank, $14,-266.28; cash in office, $359.39; amount due on assessment No. 70, $3,789.10.

Occidental—Receipts, $8,222,92; disbursements, $103; cash on hand, $8,119.92.

Savage—Recipts, none; disbursements, $12,-959.85; indebtedness, $11,200.

Utah—Receipts, $29,019.75; disbursements, $10,799.50; cash on hand, $14,186.89.

BORING for oil has begun at Sargent's tar springs, near Gilroy.

The San Francisco Sub-Treasury.

The transfer of the office of the United States Sub-Treasurer in this city was made at the close of bnsiness, Angnst 31, 1881, from Wm. Sherman to Nathan W. Spaulding, be receipting for the entire assets thereof, according to tbe balances shown hy the books of the office in its several accounts, in the total sum of $45,575,-997.93. The count was conducted by Mr. Sherman, Mr. Spaulding being represented by J. W. Dodge, when not present. The numher of counters employed was 16, besides superintendents and laborers, daily for two months, and all worked six honrs. The counting of the silver fractional coin was equivalent to the amonnt of $8,000,000 in half-dollars, or 16,000,000 pieces. The money was put np in bags of $1,000 each, and these bags occasionally overrun or fell short 50 cents; but the connt of this immense sum of over 18,000,000 pieces did not vary from its record in amount a sum exceeding $5. The whole amount of counterfeit embraced in the whole sum of over $19,200,000 silver, including all variance in connt was $63, and the final footing of all the money showed a deficiency of one cent.

Mr. Spaulding has made no changes in the clerical force of the office, and will not until he becomes more familiar with the duties and capabilities of the man performing them. It may not be inappropriate from a long personal acquaintance with the new Treasurer, for us to congratulate the public on the accession to office of so good a business man, and one so likely to make a good Treasurer. Mr. Spaulding has been Mayor of Oakland, and is high in rank in the Masonic fraternity. He has established in our midst one of our most flourishing home industries—the Pacific Saw Co.—and is the inventor of the famous removable tooth for saws, which hears his name. He has been for many years in business among us, and has won not only an enviable reputation for business integrity, but for urbanity and high character from a social point of view. It is pleasant to see a man of this type placed in one of those pnblic positions which is too apt to fall to the lot of a mere politician.

THE California Southern railroad track is now laid seven miles north of the San Diego wharf. Work is proceeding at the rate of a mile a day.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

BUNKER HILL.—Amador *Dispatch*, Sept. 3: The Bunker Hill mine, near Drytown, is in a prosperous condition, and everything around it wears a lively and business-like aspect. The mine is down about 500 ft, where the ledge is about 18 ft wide, and apparently of good paying quality. The 40-stamp mill is kept constantly pounding away.

THE KEYSTONE, of Amador City, still retains its position as probably the best and most constantly paying mine in the county, and there is no danger of its losing that distinction for several years to come.

THE EMPIRE, at Plymouth, is baving its north shaft retimbered, which is now near completion, and when finished new hoisting works, the timbers for which are already framed, will be erected over it. Only 70 of the 80 stamps are running at present, which, owing to the scarcity of water, are being run mostly by steam power.

THE PACIFIC, which joins the Empire on the south, and which has been somewhat prospected about 1,000 ft below the surface through the Empire shaft, is now at work erecting a large mill which will probably be completed within the next two months. Its motive power will be supplied by water brought from the Amador canal, through the new ditch which was recently dug from the main canal to Plymouth.

ROBERT STEWART'S little 5-stamp mill near the West Point bridge on the Mokelumne river, is kept busy crushing the rock from his claim, which is taken from three tunnels, which are so situated as to place them in the position of three distinct levels on the same incline ledge—the stoping being done from, and on a line with the main tunnels. He is crushing about 7 tons of ore per day.

SOME remarkably rich rock is being taken from the Modoc mine above Volcano, and crushed at the Pioneer mill. It is estimated that the rock will average $40 or $50 per ton, which is extracted by tunneling into the mountain instead of by sinking a shaft. The ledge is about 4 ft wide, and the ore easily extracted

BUTTE.

NOTES.—Orovllle *Mercury*, Sept. 2: The main tunnel of Treasure Box mine is in 750 ft, and progress is being made at the rate of 10 ft a day. Wednesday noon the men struck good paying gravel. No attempt, however, will be made to wash it. The Miocene patent arrived from Washington a short time ago, and Major McLaughlin notifies the parties who own the ground that is covered by the patent that he stands ready to make out the deeds of conveyance to them, if they will call at the office inside of 30 days. Wednesday night, Reed & Bird started their water wheel at the wing-dam, but twisted off the end of the main shaft. The argument in the Miocene case took place before the U. S. District Court, Monday, and occupied the entire day. At the close of the argument both parties were given 10 days in which to file briefs. Judge Sawyor will probably render a decision soon after the briefs are filed. The mining men are quite jubilant over the able efforts of their attorneys, Sam. Wilson and Judge Wallace.

CALAVERAS.

MILL STARTED —Calaveras *Chronicle*, Sept. 3: The gravel mill which has been in course of construction on the Corral Flat mine is now completed and was run a few hours during last week on trial. Everything proved to be in perfect order and to run smoothly. We have yet to see a mill, the erection of which was directed by J. bu Steele, that wouldn't work right from the word go. As soon as "breasting" in the mine is commenced the mill will be kept constantly running. Some gravel which was crushed while trying the mill showed splendid prospects.

EXTENDING DITCH.—Those successful and enterprising miners, Messrs. Cook Bros., owners of the famous Eureka hydraulic claim on the Calaveras river, are now busily engaged in extending one of their ditches which supplies the claim with water. It is the intention to take the water from the North Fork of the Calaveras river, better known as Esperanza creek. This will necessitate the digging of seven miles of ditch, which is now being undertaken and pushed forward with the vigor which has characterized all the operations of the owners of this property. There are at present over 60 men at work and it is the intention to have the work completed before the rains. It is an expensive undertaking, but when finished it will add greatly to the value of the whole property

RASPBERRY.—*Mountain Echo*, Sept. 3: We were shown several specimens of ore taken from the Raspberry mine, one day last week, by Bennett & Co., which is decidedly rich. The shaft from which these specimens were taken is about 20 ft deep, and the vein or lode is about 5½ ft in width, and still grows wider as the shaft is sunk deeper. Some of the ore contains a vast amount of sulphurets, in which considerable gold may be seen.

EL DORADO.

A RICH "POCKET."—*Mountain Democrat*, Sept. 3: An old gentleman named Gregor or Gregory struck a "pocket" of decomposed quartz, in a ledge near the Mormon Tavern, below Clarksville, last week, from which in a few hours he took out about $800.

RICH GRAVEL.—At the Lyon mine, Prospect Flat, they are working a large body of extremely rich gravel with highly remunerative results. Good gravel, and a considerable body of it, has also been struck by the same company in their Cedar Ravine mine, formerly known as the Dickerhoff & Goyan claim. The supervision of both these properties keeps Capt. Huchinson, the Supt., quite busy.

EUREKA.—Georgetown *Gazette*, Sept. 2: Work at extracting ore in the Eureka has been temporarily suspended, but the pump is kept running. The work of prospecting the mine has been carried to a satisfactory point. The body of ore is immense, ranging from 20 to 30 ft in width. It is, however, of low grade. Between 50 and 60 tons of this quartz has been thoroughly tested, and enough is learned to know that the Eureka will pay if the proper reduction works are put up. This is now the matter for consideration by the company in New York during the next two or three weeks. From the best we can learn, the rock averages about $4 in free gold per ton, and the sulphurets, $80 per ton, it requiring about 12 tons of ore to produce one of sulphurets. Occasionally high grade ore is met with, and the mortar tests from this has naturally caused extravagant estimates to be made by some. The shutting down of work on this mine has caused a feeling of distrust among many of our people, but we entertain no such opinion, as we are satisfied that a mill will be erected on the mine this fall. Another thing, it would not be an act of economy to continue hoisting rock with no ore bins or beds prepared for its reception, and further this cannot be done until the plan of the reduction works has been matured.

THERE are at present two gentlemen stopping in town, engaged in the business of bonding and buying mines. We learn of three mines in this vicinity which have recently been bonded, but not learning that any cash had been put up, we are inclined to the opinion that a dividend is not likely to be declared for some time.

WORK has been resumed on the Martha Ann quartz mine, about 5 miles north of town, owned by E. C. Check. Robt. Cushman, Sr., and Frank Check went up Tuesday. They are now drifting on a 6-ft ledge which prospects very fair. The ledge was reached last spring by running a tunnel into the hill some 90 ft.

INYO.

BEVERIDGE DISTRICT.—Inyo *Independent*, Aug. 27: The Keynot mine continues to produce astonishingly rich gold ore. Taylor & McEvoy's 5-stamp mill made a partial clean-up during the past week, after an 8-day run, and obtained $10,000 in gold bullion as a result. The Keynot is proving to be a first-class mine, it having already produced about $75,000, with a comparatively small extent of

development. Other claims in Beveridge are being prospected, which are said to be showing up as good as the Keynot. Considerable ore has been taken out, but there being only 5 stamps running in the district, the quartz cannot be crushed until another mill is erected.

MARIPOSA.

STRUCK IT BETTER THAN EVER.—Mariposa *Gazette*, Sept. 3: Messrs. Harvey & M'Cook, who for some time past have been working a vein, or strata, of decomposed quartz, located in the barley field near the road leading to Colorado, have recently struck the main vein, lying parallel and within a few inches of the strata they had been working upon. At the depth of 40 ft the strata had pinched out, and the owners despaired of finding anything to justify their working further in the same locality. After spending several days prospecting around for other diggings, Mr. Harvey bethought himself to stick a pick into what was supposed to be the foot-wall of the strata which they had followed down as before mentioned, and had penetrated but a few inches before passing into a well defined vein of excellent ore about 2 ft thick. Messrs. Harvey & M'Cook are industrious and practical miners, and their prospects of ample reward for past labors are very encouraging.

NEVADA.

CONTRACT LET.—Nevada *Transcript*, Sept. 1: The Gen. Grant mining company, whose claims is situated on the ridge, near the Town Talk house, has let a contract to run another 100 ft of tunnel to Joseph Fouyer. The tunnel is in already 425 ft. The company expect to strike the pay channel or ancient river bed, which is known to run through the ridge, in about 200 ft farther.

PATING OSK.—The old Marshal orchard, at the south end of Auburn street, Grass Valley, owned by Messrs. Lowery & Young, is being developed into quite a quartz mine. Twenty-six tributers are at work on the property, the ore paying from $50 to $150 a load. It is estimated that the ground has produced about $25,000 during the year and a half that prospecting operations have been going on. Arrangements are now being made to work it systematically.

SQUAW CREEK.—*Idaho World*, Aug. 20: Five locations have been made on the Liberty, on Squaw creek. The ores of this vein contain copper enough to pay the expenses of shipping to Salt Lake, and also for reduction. We understand that John D. Gray, of Boise, will erect a smelter there if development shows a vein of sufficient extent and richness to justify it.

FAYETTE.—H. C. Thompson and N. Carpenter are working their hydraulic claims on Payette, and are doing well. Thompson's diggings are 6 miles above where the road strikes Garden valley, and Carpenter's 4 miles above. Carpenter's son, about 14 years old, and his daughter, aged 11, are carrying on mining operations on the side, by means of a sluice. They do all the work themselves in their claim, and the other day made a clean-up of several dollars. These youngsters take as much interest in delving for the precious metal as old miners, and, considering their ages, they are experts.

PLACER.

IOWA HILL.—Cor. Placer *Herald*, Sept. 3: Prospecting still continues on the divide in spite of the Debris question. The upper divide is filled with prospectors, and some fine quartz ledges are being found. Alfred Nahor expects to strike gravel soon in the Giant Cap mine. The Sucker Flat mine still continues to pay as usual. The Mountain Gate at Damascus is doing well. Hidden Treasure mine has resumed work again after having refitted their tunnel with new iron rails in place of the wooden ones.

RICHER THAN EVER.—We have heard it reported that the Paragon—Breece & Wheeler's drift mine at Bath—is turning out richer than ever, and as an'evidence that the report is pretty well founded, we noticed in the Auburn Express office a few days ago a sack containing 62½ lbs. of gold bullion which had just come from Forest Hill, and which we were told was the result of a month's clean-up from this mine. There must have been at least $13,000 in the sack, which is not bad, considering they are situated so as to be able to work but comparatively few men.

RISING SUN MINE.—The latest official letter from the Supt. of the Rising Sun mine, at Colfax, says: New shaft is sinking through country rock, showing a fine ledge formation, carrying a vein as strong as that in 3d level of old shaft. This new part of mine is showing a development of ore that adds largely to value of property. No. 4 and No. 5 levels west from old shaft are being pushed ahead to intersect new shaft. These drifts both carry pay ore in the face. Ore in No. 5 shows coarse gold, and well distributed through quartz Hoisting works over new shaft are completed, and machinery works well. New mill is running regularly, and silver plates show ore now milling to be of good quality.

PLUMAS.

THE WESTERN.—Plumas *National*, Sept. 3: Bell & Co. are still getting big pay from their Western claims in Newtown Flat, and show some coarse gold for every clean-up. They certainly have the old lead, and the owners are positive that they have a large section of rich ground in front of them.

NEW MINING COMPANY.—On Wednesday last articles of incorporation were filed of the California prospect mining company. The principal place of business is Quincy. We have talked nt some length with the gentlemen interested in the matter, and for several reasons it seems to us that the proposed mode of action of the company is as well calculated is to secure safe and profitable investments as it could well be. It is essentially a home company, having been organized in Quincy by men of responsibility and good standing, and who are well known in this county. It is proposed to purchase no mining property whatever until it shall be bonded to the company for a period sufficiently long to enable a thorough examination of the same to be made by its own agents. Instead of risking large sums of money on the uncertainties of any one parcel of mining ground, the risk is to be divided among as many valuable tracts as the company may secure. This will furnish to those miners who possess valuable claims, but are unable by reason of limited means to develop them, the opportunity of offering their property to responsible men, receiving in return a fair price or a stock interest.

SIERRA.

ON THE LEAD.—*Mountain Messenger*, Sept. 3: The Bonanza gravel claim, Howland Flat, was lately sold, with some adjoining ground, to Cornish capitalists, for $300,000, to which was added $100,000 for working expenses. The first two months and a half $12,000 was realized over expenses, 1½% a month interest on the whole sum invested. Then, unfortunately, the main channel was temporarily lost, and the new owners ran behind $7,000. But the energetic and persevering Supt., M. L. Stangroom, Esq., did not for a moment despair of finding the gold lead, and encouraged the English company to spare neither coin nor muscle toward the attainment of that desirable result; and the outcome has proved the correctness of his theory. Once more is this property on a paying basis, with a fair chance to do far better in the near future, the present monthly net income being $5,000. One hundred and fifty carloads of gravel is being taken out per day, that yields $5.50 each. For a time they averaged $8. The highest reached was $200 for 8 carloads. The pay channel now runs about northeast. The gold assays 914 fine, and is worth $18.65 above melting expenses. The main tunnel is 4,000 ft in length; beyond gangways and breasts, 1,200 ft. The grade from mouth of tunnel to underground workings, 50 ft. Air tunnel, 1,000 ft long. Air shaft 375 ft in depth. Seventy-five men inside and 20 outside. The Bonanza now is one of the most promising gravel mines in Sierra, and the plucky stockholders have the best wishes of all our citizens for abundant prosperity.

THE Exchange gravel claim, Mount Criso, two weeks ago took out 11 ounces to the set of timbers, and has been doing well ever since; 8 men are at work. At the Swallow, 4 men are at work taking out considerable gold. Col. Baker has finished his clean-up at Grass Flat, and the returns were satisfactory for the disadvantages under which he was obliged to work this year. We wish him more success next season. At Poverty Hill, Hudron, Kingdon & Co. have their tunnel in over 3,000 ft, which required 14 years to run, through hard rock, at an outlay of $200,000. Estimated expenses of sluices to be placed in tunnel, $10,000. By next spring everything will be in order for work, and this claim will then be one of the most remunerative in Sierra. J. ft. Thomas is experimenting with his new boring machine with encouraging success on the ridge between Gibsonville and La Porte. He has found several rich gravel channels, that are soon to be developed, backed by all the necessary capital. The Queen Gravel Co., Port Wine, had a fair gold harvest this season. The Ohio Co., Wahoo, are employing 40 men, and sluicing out large amounts of gold. The French Co., Port Wine, are putting their diggings in order for next year. They have done well this season. U. S. Mineral Surveyor, Chas. W. Hendel, is surveying the tunnel, now in f,200 ft, of the St. Lawrence claim, Port Wine, in the north side of Iowa ridge. A Burleigh drill is soon to be operated there. Bunker Hill gravel claim, Little Grizzly, now yields $20 a day to the pick.

NUGGET.—It is currently reported at Forest City, that some person, as yet to learn and an anxious world unknown, picked up on the ridge above the Pliocene, a piece of float quartz containing 93 ounces of gold. The name of the person and the exact locality of the find are as yet kept a secret, for the purpose of enabling the lucky man to find the ledge from whence it came. The old Empire ground, Howland Flat, Louis Goss, lessee, is yielding some over expenses. Gold averages $66 fine. Forty-eight men inside, and 5 outside. One gangway runs 680 ft toward Bonanza, 80 ft below its works, and 5 ft above bedrock, through hard cemented, blue washed gravel—all of which that was sluiced to the right, yielded in one month $2,480 to 30 picks. The drift claim of Brundridge & Weimer, St. Louis, has paid well this season.

RICH YIELD.—Twenty-four hundred dollars were sluiced out of the gravel at the Bunker Hill, Little Grizzly, in 4 weeks, to 6 picks. Owing to the bad air but few men can be worked. Last run made paid $18 to the hand per day. We saw 122 ounces of gold from this claim being weighed the other day, with $16 50 per ounce, by D. McKeever, at his store in Poker Flat, which reminded our old-timer, T. Clegborn, of the good old days when the nuggets were taken out of the creek by the bushel.

CIMSONVILLE.—Union Co. have an incline down about 100 ft to nles appearing bedrock. Main tunnel is in 5,000 ft. Front channel was worked out years ago. The boys are are now running for the back lead. The nights are breezy, with heavy frosts. Bootjack are working 2 men on a shift, cleaning out the Chalcedony tunnel. Rich gravel is expected not far ahead.

NEVADA.

WASHOE DISTRICT.

CON. VIRGINIA.—*Enterprise*, Sept. 4: The joint Best & Belcher crosscut has been advanced 26 ft. The joint California winze has been sunk and timbered 7 ft, and have completed setting the hoisting engine.

CALIFORNIA.—During the past week 90 tons of ore have been extracted from the 2000 level. A station is being cut out in the joint Ophir winze at the 2700 level.

MEXICAN.—The joint Union Con. east winze on the 2500 level has been sunk and timbered 9 ft.

SIERRA NEVADA.—East crosscut No. 1 on the 2500 level has been extended 30 ft, and No. 4 crosscut 31 ft. The main north lateral drift has been advanced 32 ft. Drill hole No. 2 has been extended 195 ft, and drill hole No. 3 228 ft.

UNION SHAFT.—Are repairing the 1600 drift to the Sutro tunnel connection, and easing timbers at the 2300 level.

UTAH.—During the past week the incline has been sunk and timbered 20 ft. The west crosscut on the 400 level has been extended 17 ft.

GENIR.—A station is being cut out at the 2700 level of the joint California winze.

UNION CON.—The drift west from the joint Sierra Nevada winze has been extended 20 ft.

ALTA.—The pump station at the 2150 level is completed, and are now excavating at the 1900 level for a counterbalance for the rods.

NEW WELLS-FARGO.—The south lateral drift on the 500 level has been extended 14 ft. The vein material on the face is still looking well and giving low assays.

YELLOW JACKET.—The north lateral drift on the 3000 level has been advanced 38 ft during the past week, making the present length of the same 138 ft from the switch. The ground in this drift continues very hard and free of water.

KENTUCK.—On the 340 level have gone west 5 ft 2 sets high in low-grade filling; worked north 5 ft 3 sets high. In the north drift, same level, have gone north 5 ft 3 sets high; started an uprise. Have assorted and piled up 8 tons of low-grade ore per day.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, Sept. 3: The mine has shown few changes of importance during the week. The intermediate, between the 1st and 2d levels, continues to look well, and is producing ore of good average grade. The levels above the adit present the same appearance as in last report. The 10th, however, shows some improvement and promises well for the future. There are being extracted and sent to the mills 83 tons of ore daily. Both mills are running steadily and doing good work. Shipments of bullion for the week ending August 31st were $23,478 01. Shipments on August account to August 31st, $94,187.48. About $12,000 more will be added to the total shipments for August, making the amount shout $106,187.48.

MOUNT DIABLO.—The east drift from the bottom of winze No. 1, from the 3d level, shows improvement, and is giving ore assays from it averaging from $70 to $80. The west drift on the 2d level is looking very well, and showing a 2-ft ledge of ore that assays $100.

HOLMES.—The operations of this mine for the month of August have been the work done in the main tunnel, and that of opening out and running the lower tunnels to cut the ledge at a greater depth. The lower tunnel is now 40 ft in length, the face of the same being very hard ground.

ESMERALDA DISTRICT.

THE CENTENNIAL.—Esmeralda *Herald*, Sept. 3: Work still progresses in the incline, and fair progress for the week has been made. The ledge retains its width, and the ore is improving. The Centennial is destined to make its mark as a heavy bullion producer.

THE COMET.—The incline has reached a depth of 310 ft. The ledge averages 8 ft in width the entire distance, and we are informed that, without any sorting whatever, the ore will easily mill $60 per ton. Drifts have been run east and west, which demonstrate the fact that the same character of ore exists in both directions. Under Mr. Wells' superintendency everything in and about the mine moves like clock-work.

THE ROTHCHILD.—"Yank" Guptell is putting the mine in shape, so as to be able to do some good work during the winter in opening up the Rothchild.

THE HUMBOLDT WEST.—The work of developing this property goes steadily forward, and it is showing up nicely. There is no sign of the ledge growing less, nor of the ore being of lower grade as the work progresses. On the other hand, the ore is, if anything, a little better quality than in the crosscut at the 100 level.

GRANTSVILLE DISTRICT.

THE ALEXANDER.—*Bonanza*, Sept. 3: There are no new developments to report in either the Alexander or Brooklyn mines since my letter of a week ago. The Alexander stopes are looking well, and producing their usual amount of ore. In raising up above the No. 5 level, on the large ore body, we have passed through thin sulphuret into fine chloride, which is likely to continue to the surface.

THE BROOKLYN.—In the Brooklyn the No. 2 drift going west was advanced 10 ft through fine ore during the past week. The No. 3 drift, which is also being driven in the same direction, is showing some nice quartz.

ALEXANDER MILL.—The mill shut down yesterday to clean up and make the necessary monthly repairs. Will start up again to-morrow.

SAFFORD DISTRICT.

IMPROVEM.—Eureka *Sentinel*: A constant improvement is noted in the mines of Safford district, and the owners of claims there are greatly encouraged. Within the last few days some extraordinarily high assays have been obtained. We hear of several rangling above $500 to the ton. There can be no question that there is some very rich ore in the new district. The reaction has come, and nearly everybody believes the camp is going to pan out well.

ARIZONA.

MYERS DISTRICT.—Cor. *Journal*, Sept. 1: The famous Gunsight mine is a bonanza. At present, at the bottom of the 200-ft shaft, there is a crosscut of 22 ft, all in ore that will assay $75. The next company working in the camp is the Montezuma mining company, and as far as they have developed their mines, this McLellan and Montezuma, they have made a good showing, and from appearances will be the first to erect reduction works. The Mineral Bed is that down. Mr. M. Campbell is working his Red Buck mine and Julia mine, and from the showing on the bottom of the Julia mine 20 ft down, there is a 4-ft ledge of good ore that will assay $175 per ton. The Red Buck is the south extension of the Gunsight mine. The extension of Silver Cirt is down 100 ft in good ore. There are several good locations and mines in this camp. At present assessment work is the most of importance.

TOMBSTONE.—Cor. *Arizona Journal*, September 3: At Grand Central a prospect drift has been run on the 300 level, resulting in the uncovering of a large body of rich carbonate ore from an entirely new part of the mine.

ALTA MINE.—The very hard rock noticed some time since has at last been got through, and they are now sinking at the rate of 3 ft per day in a bed of highly mineralized porphyry, which is supposed to form the hanging wall of their ledge which crops boldly out 300 ft west of the shaft.

ALPS MINE.—This mine adjoins the Alta on the southeast, and is sinking a shaft near the center of the claim, on a small vein which promises well.

INDEPENDENCE.—A shaft was started on the east side line (south of Alta bill) on some croppings showing mineral. This has been followed down 12 ft with most encouraging results, the rich carbonate vein was struck.

SCRATCH MINE (San Pedro Co.)—It lately started up again, under the superintendency of John Newsmoake, late of Tucson, and from the improvements noticeable, I conclude that work on this property will proceed on a business basis. They have stopped sinking, and are drifting northeast and southwest from the 100-ft station.

MANY miners have applied for patente to their ground, but few have as yet secured them, as in most cases adverse claims have been filed, many of which have no foundation whatever, being simply blackmailing arrangements.

SOUTH PIONEER.—Pinal *Drill*, Sept. 2: The South Pioneer Company is a Globe organization. Her leading capitalists, miners and merchants, own the stock. The company has worked quietly and industriously to develop its property. They have expended $3,000 in building a good road from Dripping spring to their mine. They have bought, and is now on the way to the mine, steam pumping and bolsting works. Forty-six men are on their pay roll. There are 3 shafts, the deepest 80 ft, and one drift 90 ft long, all in high-grade ore. Eighty-seven tons of ore have been shipped to San Francisco, averaging $219 per ton. There is on the dump over 200 tons of ore worth about $200 per ton. Every opening in the mine is in rich ore. Everyone who has visited the property report it one of the best in the district. "Common fame" pronounces it a mine of great value. Its officers are men of the highest standing and experienced miners. The mine is situated near the summit of the Pinal mountains, in the immediate vicinity of fine timber and water, 22 miles from Globe in a south course.

GROOM CREEK.—*Arizona Miner*, Sept. 2: Mr. Merrington, superintendent of the Chicago and other mines on Groom creek, is doing good work for this section of Arizona. Work already done by his men on the Chicago shows that mine in a very rich light. An assay made a few days ago gave a result of $800 gold and about $200 silver to the ton. Mr. Abe Kiewe, a storekeeper of Big Bug district, arrived here recently. He praises a mine on which Messrs. Stoddard & Collins have men at work. This mine is near the head of Big Bug creek, not far from the famous Bello mine. The pay rock is fully 4 ft thick. Mr. Brown, who has been at work on the McCrackin mill, Mohave county, came to Prescott yesterday. He left the mill running and paying. The Silver King has made another shipment of $25,000. Mr. Buffum is preparing to start his Crook Canyon mill. It will first crush 150 tons of ore from the Lawrence mine. Frank Murphy and others are prospecting the Providence lode. Flint & Go.'s steam rastras, near the head of the Hassayampa, will be running in a few days.

DAKOTA.

GALENA DISTRICT.—Black Hills *News*, Sept. 3: There is no camp in the Hills where the outlook is brighter than at Galena. The people are full of business and there appears to be more money in circulation in proportion to the population than in any other portion of the Hills. The Sitting Bull is still putting out a large amount of high-grade ore, which is sent off to Omaha for reduction. Col. Davey is working a large force of men on the mines as well as on his ditches.

MR. VICTOR RUSS is rebuilding the old smelter on a new plan, and within a few days will convince the people that ores can be successfully treated at home.

THE Red Jacket mine is making preparations for shipping its ores to Omaha, while the Silver King will soon pass into the hands of New York parties.

THE MINNESOTA MINE.—The Minnesota mine, which is located in Pennington county, and which was some time since bonded to Judge Bennett, Gov. Ordway and others, for $45,000, is said by those who ought to know whereof they speak, to be as good a mine as is to-day in the Hills. Judge B. already thinks himself the prospective owner of a second Homestake, and we hope he is. The Governor, who is in New York, will, with others, organize a stock company and issue sufficient stock to furnish a good working capital, and for the erection or purchase of a 60 or 80-stamp mill. Success to the enterprise.

BEAR BUTTE CREEK.—From the divide at the head of Spruce gulch to the crossing of Bear Butte creek, the country is a vast wood and timber camp. There is thousands of cords of wood piled up and marked H. S. —Homestake Co.

Two miles this side of Bear Butte creek crossing there is an immense quartz reef, running across the country at right angles with the road, and precipitous on the Bear Butte side. It is the jumping off place of an extended plateau, commencing at the ridge at the head of Twobit gulch. This quartzite reef pitches in this direction at an anglo of about 20 degrees.

IN the opinion of this reporter that country is a good one for the prospector. If there is $8 ore on the surface close to the reef, there may be, and we think there is, $100 ore 200 ft back of it, and if this is so, there is an immense field of it, as the reef in question is miles in extent, and the formation is the same throughout the entire distance.

IDAHO.

BULLION MINES.—Wood River *Times*, Aug. 31: The Bullion, Mayflower, Jay Gould, G. K., Ophir, Eureka and Idahoan mines continue to attract visitors to Wood River. These mines have now passed out of the lists of prospects, and are mines indeed. Their ore-yield seems to be limited only by the impossibility of getting enough teams to haul the ore away. A number of men were laid off last week from this cause, but arrangements are being made at railroad points to have teams come in light to haul ore away, and in a few days a large addition will be made to the number at work. About 175 men are now employed. Next month about 250 men will be put to work. This is only on the principal mines. Of course, the many small claims being opened up will continue as before.

NEW STRIKES IN THE EUREKA.—A new strike was made in the Eureka last Saturday. In running the tunnel from the bottom of the shaft the ore pinched out after the tunnel had got in about 30 ft. Ten ft further, ore came in again, and on Monday afternoon the ore vein in the breast of the tunnel was fully 2 ft wide, and assayed about 125 ounces.

THE hoisting works of the Bullion mine are working smoothly. Machinery has been ordered for the Mayflower and for the Eureka. There is no foundation for the reported sale of the Mayflower.

ATLANTA NEWS.—Cor. *Idaho World*: The Buffalo Co. are repairing their mill and will start up about Sept. 15th. Their mine is turning out very rich ore. The Monarch Co. are working 8 men. This is most likely the most extensive and richest mine in Alturas county. They have, so far, developed a chimney of about 700 ft in length, and still continuing on. The greatest depth obtained on this mine is 200 ft where the ledge is immense. A 20-stamp mill and hoisting works will be erected in the spring. Queens river mines are at present idle. Considerable travel through to Sawtooth where a saw-mill and 20-stamp quartz mill is going up. The saw-mill will be running by the 28th. Billy Short has struck a big mine near Galena. I visited Julian Hill's mine and found a very good looking mine.

MONTANA.

ALICE.—*Inter-Mountain*, Sept. 3: The center seam of pay ore on the 700 level of the Alice continues to improve with the extension of the drifts. Supt. Hall states that yesterday some ore of very excellent grade was encountered in the face of the east drift, and that native silver abounds throughout the quartz now being extracted.

MAONA CHARTA.—The recent developments in this magnificent property are of a very encouraging character, and give assurance in the near future of a great and permanent productive capacity.

STAR WEST.—Since operations were resumed on this property under the management of Mr. Williams, the sinking of the main incline has been prosecuted with vigor. For several weeks past the grade of the ore has been somewhat low, but within the past few days a great improvement in quality has occurred. The width of the pay ore body in now about 18 inches, and sample assays average $125 per ton.

BELL.—Mr. Meader is very quietly but energetically pushing developments on this mine, which has been visited of late by many well-known mining operators, who have united in expressing a highly favorable opinion of the property. Since our last report the whim shaft and the winze from the 100 level have been connected at a depth of 300 ft.

ANSELMO.—Although Mr. Lacaff is kept very busy in superintending operations on the Sheridan, he still has time to direct the development of the Anselmo in such a way as to secure the most profitable results from his expenditures. That he is meeting with success, and that the Anselmo is to-day one of the best paying properties in the district, he makes no attempt to disguise. The 15 tons of ore which the Anselmo yields every day are being worked to a handsome profit at the Silver Bow mill in spite of the fact that he is required to pay $27 per ton for its reduction.

NEW MEXICO.

THE AZTEC MINE.—*News and Press*, Sept. 3: Mr. Chas. Smith has thrown up his tunnel contract on this famous old mine, the wet weather and hard rock proving too much for him. We understand from Mr. Sherwin, the President of the Maxwell Co., that work will be at once resumed and vigorously pushed by both day and night shifts. There is considerable dead work necessary to reopen this mine, as the old shafts and tunnels have become dangerous by disuse.

RICH ORE.—Jesus C. Abreu, the wealthy ranchman of Rayado, recently showed us some specimens of gold ore that were rich enough to excite the cupidity of the most blase mining man. The ore was a greenish white quartz that had the appearance of being silver rather than gold-bearing but for the visible evidence to the contrary. The ore was filled with rounded shot gold, from the size of a pin head to 2 or 3 times that size, that seemed to have melted. It was different in character from any that we have before seen from this district. We could learn nothing concerning this discovery except that it was brought to Mr. Abreu by an old man who had found it by accident.

OREGON.

MINING.—*Bedrock Democrat*, Sept. 3: For some time our enterprising townsman, Chas. St. Louis, has been at work in Washington gulch running a tunnel to a basin which is reported to be very rich. The tunnel is now 475 ft long, and lacks about 15 ft of being completed. The tunnel is being run for the purpose of getting fall and a place to lay a flume.

BIG APPLEGATE.—*Democratic Times*: Wm. Heeley came down from Big Applegate this week, from whom we learn that the dam at the head of the Squaw Lake Co's. ditch will soon be completed. The ditch itself will also be cleaned out and put in repair soon. This looks as if the company intended to commence mining operations in the near future.

THE Sterling Mining Co. is enlarging its ditch for more extensive operations.

J. B. FARLEY and W. H. Gilson have sold their claim on Sterling creek to Ankeny & Co for $500.

A NUMBER of men went up to the Squaw Lake Company's ditch yesterday to commence work, and more will follow. We learn that the bulkheads will soon be replaced.

GALICE.—Green Bros. of Galice creek, are taking out ore of a fine quality. Their tunnel is approaching completion and the company then expects to inaugurate operations of a more extensive nature than ever.

FOOT'S CREEK.—Geo. W. Lance, of Foot's creek, was in town this week, who informed us that his company are about commencing preparations for winter. Improved apparatus will be procured and more extensive operations than ever inaugurated. The Sterling Mining Co. finished cleaning up last week, and the result is said to have been flattering. Preparations for winter will immediately be commenced. The extension of the ditch is now going on and a huge reservoir will soon be built.

UTAH.

THE COMET.—*Southern Utah Times*: Work has now been begun in earnest upon this most promising property. During the past week a large amount of tunneling has been accomplished under the direction of Supt. Morrison, who reports a new discovery of ore, giving an assay of 20% copper. The extension of the property, known as the Southern Utah Times, will no doubt be developed soon by the owners, the Morrison Bros. and King.

THREE years ago Lieutenant-Governor Tabor, of Colorado, was only the proprietor of a small store in a mining camp, and provided two miners with food and outfit for a prospecting tour around Leadville, stipulating for a certain interest in any claim they might find. They soon discovered the Little Pittsburg mine, from which Mr. Tabor derived a large fortune, since which he has been so successful in mining operations that he is estimated to be worth several millions.

THE high price of lead should start many of the low grade mines in Utah. There is a prospect of good prices continuing as long as the building boom lasts, and the boom may be said to have hardly commenced.

Who Next, after the Hydraulics.

The owners of quartz and drift mines are at last fully awake to the danger that threatens their rights and property through the conspiracy of the lawyers, who are manipulating the debris suits, says the Marysville *Express*. They now understand full well what the term "fouling the rivers" means. They know to a certainty that they cannot wash an ounce of gold from drift or quartz and not foul the rivers. They have also come to know that the promoters of this unnecessary litigation planned in the ontset to divide the hydranlic mining interests from those of quartz and drifting, in this contest, waging war on the former and conciliating and pacifying the latter. Thus by taking each industry in detail the contest would be much easier and the spoils far greater than to antagonize both interests at once. Once stop hydraulic mining and see how quickly the enemy will move on the quartz men and drifters. These tactics do honor to the cunning of plaintiff's attorneys, but the operators of quartz and drift mines are not the least intelligent class of men in the world, and if defeated in the protection of their rights and property it will be while standing shoulder to shoulder with all eystems of gold and silver mining. When at last gold mining shall have been prohibited, one thing will yet remain to be done. Gather together every scrap and page of the glorious history of the Golden State, burn them to ashes, and re-christen her with some new and unknown name. Then when other nations ask to know regarding our gold basis, with how much pride can we point to our potato and melon patches, founded by the flow of "slickens."

Old Meadow Lake.—The indications are that the Meadow Lake mines, which have been lingering along for so many years, may yet become a source of permanent prosperity to many hundreds of miners. The old town on the lake may one day be rebuilt, and may yet far exceed in glory all that it was in its pristine days. The iron rock—that rock upon which so many of the Comstockers "split," and not only split, but busted wide open in early days—seems now to be better understood, and it would appear, from the following item from the Truckee *Republican*, is being successfully and profitably worked: "Two mills are now in operation in Carlisle district, and both of the mines on which they are operating are owned almost exclusively by citizens of Truckee. The rock being crushed yields on an average $70 per ton. The predictions so often indulged in that Meadow Lake was 'gone in' do not seem to prove true. The Cisco Con., another large mine in that vicinity, will soon have a large mill going, with a full force of hands. Taken altogether the prospects are favorable for quite a lively mining camp in that region in the course of a year or two."

No Drunken Miners.—The Keystone mine management, of Amador City, has adopted a principle with regard to the employment and retention of laborers at that mine, which it would be well for every other enterprise to follow, where laborers are employed. No man will be hired there who is in the habit of getting drunk, nor will any one already employed be retained if he gets drunk during his employment. This system will do more to promote temperance than all the eloquent speech-making and writing of our temperance agitators combined. It will keep the men in better condition to do good work, and prevent their losing much time, besides guarding them in economy and preventing want and discord in their families. If this rule were made universal among all employing institutions there would be fewer drunkards among the industrious classes, and less reason for good, sober and competent workmen to complain of the want of employment.

Copper Smelting.—D. E. Jones, of Bodie, and San Francisco parties have taken hold of the Bluestone copper mine in Jordan district, one mile from the mouth of Mill Creek canyon, and on Wednesday, August 31st, ground was broken for the erection of a smelter, which will be erected immediately. The Bluestone is a large and very rich copper vein, carrying about 72% of copper, $10 to $12 per ton in silver, and traces of gold. The facilities for smelting are excellent, wood and water being abundant, and the company has just located ample ground for smelting works on that branch of Mill creek that cuts across the Bodie road to the northward Grant's station, and sweeps along the base of the hill under the mine.

Strike in the Eberhardt Tunnel.—The *Sentinel* learns that Captain Frank Drake has at last struck ore in the Eberhardt tunnel, White Pine district. Just how big a body has been encountered is not yet known, though there is no doubt that the development is a most important one. At last accounts the ore had been penetrated several ft. and was still holding out. It is said to be of satisfactory grade. The Captain and his company deserve this piece of good luck. They have held on to the enterprise for years under discouraging circumstances.

A New Coloring Matter.—A Vienna chemist has succeeded in producing a new coloring matter on silk, which is a nice blue by day and a beautiful pink by artificial light. The alcoholic solution of this color is dark violet in a transparent, but red in direct light.

The Event and Its Influences.

The case of President Garfield is becoming notable for its alternations of light and shade. On Saturday last hope well nigh departed, and the people prepared to mourn and to think upon fitting ways to express their grief and their respect for the memory of the dead. Quickly there was a reawakening of mind and strength, and the people again rejoiced at the chances of recovery. Thus the matter stands at this writing. The President is much better than he has been, and yet there must be much more progress gained before the President will be out of danger.

The incidents of the President's illness will not be forgotten during the present generation. Never before has the public mind dwelt upon the significance of symptoms and been led to study the relations between pulse, respiration and temperature. Never has the danger and distress of a gun-shot wound been so widely appreciated, and if the thought on this subject should lead to more restricted use of weapons in low as well as in high places, it would be a public benefit.

There has been running through the accounts of the President's sufferings which have come to the daily papers, veins of sickly sentimentalism as well as lofty heroism. The abundance of gush is, however, to be attributed to the reporters, who have free use of the wires, and it is hardly worth while to get excited about it, as some of our exchanges have been disposed to do. The debris of sentimentality may be overlooked, as the case has given the country some gleams of true sentiment, courage and bravery, which it will benefit all who contemplate them. The bravery of Mrs. Garfield, when the doctors were disposed to lose all confidence and hope, will pass into history. It appears that the surgeons, after learning the symptoms of the morning, decided that it was useless longer to continue the struggle, and two of their number were selected to wait upon Mrs. Garfield and inform her that medical science could do no more, and she must prepare for the worst. The interview which occurred between these surgeons and Mrs. Garfield will, if reports be true, be regarded as one of the most dramatic incidents in this extraordinary case. Captain Henry, Marshal of the District, and a friend of the President and his family, says that Mrs. Garfield heard the news, and smothering her emotion, arose and said:

"Gentlemen, you shall not give him up. He is not going to die. He is going to live. I feel, I know it. Go back to your post, and leave it not until every remedy is exhausted, and until death itself has set its seal upon him, for I will not believe that he is dying. Go back, and do what you can; you cannot do more; but don't give up. I am his wife, and I say we will not give him up until the end itself is upon us."

Mrs. Garfield has never surrendered more than a moment or two at a time to her grief, and then she has retired to her room, and, after a brief absence, returned to her post of duty at the President's bedside. The conduct of Mrs. Garfield is calculated to endear her to the hearts of the American people, for the love and respect for a brave spirit is irresistible. The fact that other women are just as brave and heroic in their obscure places as she has been in the face of the world does not detract from her glory, nor does her fame take from their nobility. Rather should she be gladly accepted as the exponent of the courage and devotion and trust which are characteristics of noble women everywhere, and all the praise which she receives should be taken as a tribute to all true womanhood and wifehood.

The President has suffered severely, but not in vain. The stroke at his life was the death blow of political policies which were gaining alarming prevalence, but are now abhorrent and everywhere denounced. Should he rise, as we trust he may, his opportunity for reforms will be immeasurable, for the people will be beside him in every true action and interested opponents will fly through alarm at their own weakness. Even should he die, his long weeks of torture will not have been endured in vain, for any change in administration will now be less dangerous than would have been an immediate transfer of power. We count it sure that the sentiment of the American people is much higher and the determination for a pure and disinterested administration of public affairs much stronger than it was three months ago.

Paint for Fire Brick.—There should be nothing very difficult in making a mixture of mineral pigments which will closely imitate brick red. The work of renovating brick fronts is usually confined to a few painters who make it a specialty. It requires substantial scaffolding and other special paraphernalia which the general run of painters do not have. Those who undertake this class of work, make something of a secret of their particular mixture; but a little experimenting with small quantities of the common red pigments will enable any intelligent person to strike the proper shade, which, on drying, will most closely approximate to the desired brick color. In the preparation of the pigment for use the same method would be followed as in the case of any paint for out-door work. A mixture of Venetian red and brick dust in suitable proportions in oil, will probably come very close to the material used by house painters for this purpose.—*Manufacturer and Builder.*

Glass Floorings are now being made in France, the upper surface being molded in diamonds.

Mr. Scott's Art Collection.

Mr. Irving M. Scott, well-known as one of our most public spirited citizens, ought to consider himself a fortunate man. He is held in high honor by his fellow citizens; has held many positions of trust; is considered one of the best mechanics in the city; has built up one of our most flourishing home industries, employing hundreds of men; has been President of the Mechanics' Institute and of the Art Association, and in fact of every organization of note he ever joined; has traveled around the world and brought back to his fellow-workers in this city information of great value to them, and which he gave them free in public lectures, not hiding his observations and keeping them to himself; and all this while yet a young man. And beyond this he has, which is perhaps more uncommon, taste and judgment enough to have made the best collection of paintings in the city. With characteristic good nature he has placed these art treasures in the fair, where the public could enjoy them. And the public has enjoyed them. Thousands of people who have no knowledge of art whatever, but can tell when a picture pleases them, have examined with pleasure the many gems in Mr. Scott's collection. They are pictures one can understand. They are of modern life, and represent things, many of them, with which we are familiar. And although it is the correct thing to admire the "old masters," most people will privately applaud Mr. Scott's judgment in collecting the gems of the painters of to-day. What could be more lifelike and true to nature than Brown's "Sure Thing" and "Dress Parade," the latter admired by all as a masterpiece of a master. Of local artists' work, Rix's "Pollard Willows," Virgil Williams' "Chiccory Girl," S. M. Brooks' "Fish and Vegetables," Hill's "Yosemite in Early Morning," Williams' "Peasant Pilgrims," Mrs. Keith's "Fruits," Keith's "Mt Tamalpais," and "Mt St. Helena," Yelland's glorious "Glimpse of Monterey Bay," Nahl's "California Indians," Bradford's "Greenland's Icy Mountains," Deuny's "Drifting About," Tavernier's "Waiting for the Montezuma," all are deserving of praise and are justly admired. Our citizens are proud to think the authors of these magnificent works are residents among us, and also that the owner of them all is here and will keep them here. Pilz's "Feeding the Magpie," Hintz's "Endangered Luncheon," Nargot's "The Marguerite," Bonguereau's "Pensive," Van der Venne's "Gypsy Tent," Michis' "Double Indiscretion," Schreyers' "Bursting Bomb," Richter's "Song of the "Harem," are all magnificent pieces of work worthy of their famous authors. The pictures speak for themselves, as they hang on the walls of the art gallery of the fair, and a criticism at our hands would be out of place; yet we cannot refrain from alluding to them and their public-spirited owner, to whom the citizens of San Francisco are indebted, among other things, for his generosity in giving them an opportunity to examine these art treasures.—*Mechanics' Fair Daily.*

A Curious Strike.

The Virginia *Enterprise* says: There was a pretty well authenticated report on the street last evening that a man living in the northwestern part of the city—up near the big water tank of the Ophir company—made a rich strike some two or three days ago. He was engaged in repairing and setting back a dilapidated bulkhead in front of his lot, when he struck into a three-ft. vein of decomposed material completely filled with pure gold. This is said to be the same kind of rich vein stuff that was encountered near the surface when the first discovery was made at the Ophir in early days.

The man who struck this baby bonanza had been at work at the Union shaft, but, being laid off, concluded to fix up things a little about his house and lot. If all we hear be true, he has made very good wages, as it is said he got out about $15,000 before the Ophir management heard of the matter and requested him to desist from his labors.

His wife also participated in the toil of extracting the shining metal from the little home mine, and it is said she has a half-gallon glass jar nearly full of gold that she herself pounded out of gathered lumps.

It is hard to keep "ducks out of a dough dish," and we are informed that some workmen found their way back to the vein night before last and got out about $1,500.

The vein is supposed to be a feeder that made out toward that point from the old Ophir vein, and this is doubtless the case. It might never have been discovered but for the tumbling down of the old bulkhead. One old surface tunnel passes through the ground some distance to the northward of the deposit and another to the southward. Thus the rich pocket was left concealed between.

Had the discoverer covered up his find with a new bulkhead so constructed as to leave a small "coyote hole," by which to pass in and out, he might have worked his vein for months, had he used proper caution in his mining operations.

Others will now doubtless begin prospecting along the hillsides west of town. For aught we know there may be "millions in it."

New Mexico is clamoring for more reduction works.

Odd Ways of Putting Things.

Putting things in an odd way is the vocation of professed wits and humorists; but they are not permitted at all times to monopolize the privilege, as we shall proceed to show.

Mr. Naismyth, a celebrated Edinburg dentist, finding himself inconvenienced by the noise made by the students of the Free Church College, wrote to request that they would be more moderate in their applause, or find some other way of expressing it than stamping upon the floor. Dr. Chalmers, the well-known divine, laid the dentist's complaint before the offenders, and begged them to avoid giving cause for its repetition, saying he should be sorry indeed to give offence to a gentleman so much in the mouths of the public.

When President of the United States, Abraham Lincoln was inclined to a rough-and-ready style of argument.

"It is a disgrace to the country," said a disgusted government clerk, "that such a boor should be President!" What made him say so was this. He had asked the President to give a brother, who had been honorably discharged from the army, a place in the Civil Service. "Let me see," said Lincoln, "I believe you yourself are a clerk in one of the departments?" "Yes, sir," said the applicant; "I am in the Treasury Department." I thought so," continued the President. "And your father holds an office in Washington, does he not?" Yes, sir; he is the chief of a bureau in the War Department," replied the office beggar, beginning to feel rather uncomfortable. "Is there any other member of your family holding office under the government?" was the next query, answered with: "Yes, sir; I have a younger brother in the Interior Department." Whereupon Lincoln put him out of his misery by saying: "Well, then, all I have to say to you is that there are too many hogs, and too little fodder!"

When Naples was ruled by King Bomba, his majesty one day paid a visit to the ship of an English commodore, lying in the bay. While the commodore was receiving his royal visitor on the quarter-deck, a member of the Neapolitan suite, in brilliant uniform, cruising about amidships, mistook a wind-sail for a pillar, and leaning against it, suddenly went below head foremost. The only witness of the accident, an old tar, thereupon made for the quarter-deck, and having saluted, said: "I beg pardon, commodore, but one of them are kings has fell down the hatchway!"

A gentleman, traveling in the same carriage as the pretty daughter of a rich Pennsylvania lumber merchant, chatted with her until she grew drowsy, when he vacated his seat for one by the side of a schrewd-looking old fellow. As they were whirling by a high mountain, his neighbor called his attention to it, and went on: "Six or eight years ago that mountain was covered with a fine forest, worth at least $10,000. Now there are nothing but stumps, and the land is scarcely worth a cent. The net produce of that mountain lies over there in that seat. It has taken all that lumber which her father owned to raise and educate that girl. Some of you young men, if you were given your choice between the mountain yonder, as it now stands, and the net produce on that seat, would take the net produce; but give me the stumps!"

The Comstock.

We see a great many flings against the Comstock in papers far and near—in this State and adjoining States and Territories—but when it comes right down to business and to dollars and cents we should like anyone to point out a better place than this same old much-maligned Comstock.

The majority of those who abuse the Comstock only utter that which they hunger and thirst to see. All men of course know and admit that our towns are not thronged and booming and bubbling and roaring as they were in days when millions per month were being brought to the surface; but, dull as times may be with us, they are a conflagration and a whirlwind to those seen in some of the towns and cities that are pretending to weep for us.

If it can be shown that there is a better place anywhere on the Pacific coast, let it be done. We are quite willing to be made acquainted with such a place. Our people are not so prejudiced as to remain in this inhospitable region against reason and interest. They have quite sufficient money and enterprise to go to the better place—a place even the slightest shade better—as soon as they are informed of its whereabouts.

We are becoming a little tired of the crocodile tears and the hypocritical blubberings seen and heard for "these many days" in various quarters. Show us the better land or the better town, and we will march forth and take possession of it, or at least a goodly share of it. Let those who have tears to shed, shed them at home, and for themselves.

Our people are well acquainted with the situation of every town and camp on the Pacific coast. They have scouted forth and spied the nakedness of many much-vaunted lands and the poverty of many greatly-puffed towns. As of old Noah sent forth from the ark his winged messengers, so we have set forth our scouts, and all have returned to us without having found rest for the sole of their feet.—*Enterprise.*

Mines in New York.

As quite a number of California mines are incorporated under the laws of New York, the following from the *Mining Record* is important to those interested:

In our last issue, under the head of "Answers to Queries," we gave certain requirements of the law on the part of the officials of mining companies organized under the laws of this State, with certain rights on the part of shareholders to information in regard to the financial affairs of such companies, so important that we have thought it best for all concerned to republish and call attention to the following paragraph:

"Wherever any person or persons owning 5% of the capital stock of any company not exceeding $100,000, or any person or persons owning 8% of the capital stock of any company exceeding $100,000 formed under the provisions of this act, shall present a written request to the treasurer thereof that they desire a statement of the affairs of such company, it shall be the duty of such treasurer to make a statement of the affairs of such company, *under oath*, embracing a particular account of all its assets and liabilities in minute detail, and to deliver such statement to the person who presented the said written request to said treasurer within twenty days after such presentation, and shall also at the same time place and keep on file in his office, for six months thereafter, a copy of such statement, etc.

"If such treasurer shall neglect or refuse to comply with any of the provisions of this act, he shall forfeit and pay to the persons presenting said written request the sum of $50, and the further sum of $10 for every twenty-four hours thereafter, until such statement shall be furnished, to be sued for and recovered in any court having cognizance thereof."

We would advise treasurers of mining companies to be prepared to make these detailed statements of the affairs of their respective companies, and we venture this advice because in certain cases in which we have applied for similar information to such sources, we have been answered that the information was only to be had at the office of the superintendent of the mine itself.

Oregon's Mines.

From J. W. Virtue, banker of Baker City, who is one of the oldest settlers in the county and whose extensive connection with the leading mining enterprises, says the *Bunch Grass Gazette*, entitles him to be recognized as authority, we have gleaned much valuable information in regard to the mineral resources of Baker county. His estimates the amount of gold and silver produced from Baker, Union and Grant counties since the discovery of gold in 1862, from placers, at forty-five millions. The yearly products now amount to one and one-half millions, principally from shallow diggings, from 3 to 30 feet deep. Very few of our "old river channel" gravel mines from 60 to 200 feet deep have been worked, although a large amount of this class of mining ground is to be found in Baker, Union and Grant counties. Some of these deep gravel channels have been prospected on the head of Powder river which averages $136,000 per acre. It requires capital to open these immense deposits and furnish the necessary amount of water, but the water can be procured without the expenditure of very great sums of money, and the gold products of these counties will be greater twenty years hence, from placer and gravel mining, than ever before. Quartz mining is in its infancy, and yet the yearly product is about $650,000, and the yield from that source has been about eight millions. Baker has the following mills: Connor Creek, 20 stamps; Gold Hill, 10; Moore & Eastahrooks, 2; New England & Oregon Mining Company (organized in Concord, N. H., a very responsible company), 5, silver; Virtue Gold and Silver Mining Company, 20, with steam hoisting and pumping works; Mammoth, 5; Tom Payne, 2. Besides about 30 arastras, Grant has about 40 stamps, the principal mill being the Monumental, 15; and supplied with all the modern improvements. Over three hundred gold and silver lodes are being developed, awaiting capital to put up machinery, prominent among which are Cable & Sons' group of six mines, Cable Cove, Buffalo, Hazard, Silver King, California, Granite and Silver Peak.

A Lecture Experiment.—A brilliant experiment for presenting to an audience in a lecture-room a vivid imitation of the aurora can be performed by the following suggestion of Mr. Ackroyd: As close a representation of the aurora as can be drawn is painted upon a screen (presumably a dark screen) with Balmain's luminous paint, and hung up in the lecture-room, hidden from the view of the audience, until required, by an interposed curtain of dark tissue paper. At the proper time a piece of magnesium wire is burned in front of the painting, still hidden from the audience, and when the tissue paper is withdrawn the effect of the aurora will be found very faithfully reproduced and clearly defined. It remains visible for a long time. Many other curious and instructive experiments can be reproduced by the use of this and similar phosphorescent paints.

Magnetic Intensity of Iron.—According to Rinman's investigations the magnetic intensity of iron appears to increase with the increase of carbon. In three specimens of cast iron containing .09, .30 and .57% of carbon the magnetic intensity was 5.5, 9.5 and 11 respectively.—*Berg- und Hutten-Zeitung.*

Useful Information.

Origin of Petroleum and Coal.

The origin of petroleum is one of the most practically important puzzles which is just now agitating the scientific world. It is apparent to all that the supply of coal must eventually give out. Coal is undoubtedly a surface deposit. Should the same fact eventually prove true of coal-oil, the end to that product will probably be reached much sooner than that of coal.

The generally received theory is that petroleum is a product of coal by a process of natural distillation, similar to that which is sometimes practised on a small scale artificially. That theory is not a very satisfactory one, in view of the needy future ages. Quite as reasonable and a much more satisfying theory is that recently put forth by Professor Mendeljeff, who thinks that, on the first formation of the earth, vast reservoirs of inorganic iron and carbon existed in the interior of the globe. These were reached by the water condensing on the newly formed land, percolating beneath its surface. The heat decomposed the water into its component parts, oxygen and hydrogen, the first forming with the iron oxide of iron, the latter with the carbon, petroleum and other hydro-carbons. If this theory be the correct one, there still exists in the center of the earth reservoirs of petroleum that are to the sources as yet known as the ocean is to the spring whose waters finally find a resting-place in its bosom.

In connection with the above the following letter from Scranton, Penn., recently addressed to the editor of the *Engineering and Mining Journal* of New York, will no doubt be read with much interest:

"Sir: I have looked in your paper for several weeks past to see some notice of the remarkable material discovered in excavating for the new court-house of this place. Having seen nothing, I thought it my duty to science to report upon the same. First allow me to describe briefly the location. This building site is in the heart of the town, upon a square which formerly was a swamp, but some years ago was filled with cinder from the iron-works.

"On excavating for the court-house foundations, the cinder was first removed. This was five to six feet deep. After this came a bed of excellent peat, varying in depth from eight to twelve feet. Below the peat, a stratum of muck seperated the peat from the hard-pan below. In the muck were veins of tough black jelly, resembling in all manners, except its gelatinous character, anthracite coal—luster, color, fracture. When dried slowly, it solidifies into a hard, brittle substance, which would be considered by an ordinary observer as real anthracite coal. After hardening, it does not again soften in water, hot or cold. It burns at a red heat, and leaves an ash resembling the red ash of some coals. It flames on first ignition. The jelly is acted on by alkaline solutions.

"Some analyses have given only 20% of carbon in the dried state; but I think the poorer specimens contain a larger amount than this.

"Now I am strongly inclined to believe that this is a true key to the formation of coals, and have assumed the following hypotheses as worthy of experimental examination:

"First, the formation of a siliceous jelly from the action of water upon the silica in the vegetation. Second, is it possible for siliceous jelly to extract and absorb carbon from the carbonaceous fluids extracted from the overlying vegetable matter?

"Anyhow, here is a carbonized jelly; how was it formed? and does it resemble coal sufficiently to warrant a belief that coal was formed in this manner?

"I inclose some small samples of the dried substance; and if you can get any chemist to investigate the subject, will be pleased to forward samples of the gelatinous matter."

The New Process Flour.

The millstone is a thing of the past in flour manufacture, and its place is being rapidly taken by Hungarian steel rollers. By the new process the wheat is not ground, but cracked. The rollers are of steel, about thirty inches long and eight inches in diameter, and it takes five sets of them to complete the process of flour-making. Each set of rollers runs closer than the preceding, the last having little else but wheat-hulls and the waxy germs of the wheat which do not crack up. Under the old method this waxy germ was ground with the starchy portion and bolted through with the flour, but by the new process the germ is flattened out and sifted or bolted out, while the nutritious part of the wheat is crushed into flour. Between each set of rollers the wheat is bolted or sifted through coarse cloth. This cloth lets the disintegrated particles of wheat through and passes off the larger pieces, which are put through a closer set of rollers, and so on to the end of the operation.

To describe the process more minutely, we will take a single kernel of wheat and trace its course through its various stages: The kernel is passed between steel rollers on which are lined corrugations. This breaks the kernel into from six to eight pieces, and a great deal of starchy matter falls out. These pieces are passed over a cloth sieve and the starchy particles which pass through are the best portion of the wheat. The six cracked pieces of wheat after being sifted are passed through the second rollers, which are quite smooth, but not polished, and the kernel is by this time cracked into perhaps thirty-six pieces, and the crushed matter is bolted again. The thirty-six pieces are then run through a third set of rollers and cracked into about 216 pieces, and bolting again takes place. By this time all the best part of the wheat is bolted out, and finally nothing but the hulls, a few particles and the waxy germs remain. What is left is rolled through another set of rollers and again bolted, and the hulls and grains are ground upon an ordinary millstone. The process may be not inaptly described as "cracking and mashing," and with each successive step a lower-grade flour is produced.

A home-made weather-glass may be prepared as follows: Place in a long narrow bottle or test-tube, camphor gum, 2½ drachms; spirits of wine, 11 drachms. When the camphor is dissolved add the following mixture: water, 9 drachms; saltpeter, 38 grains; sal-ammoniac, 38 grains. Dissolve these salts in 9 drachms of water before mixing with the camphorated spirits, then shake the whole together. Cork up tight and seal with wax; then make a small hole through the cork with a red-hot needle, so as to have a small clean hole. Heavy atmosphere will cause the salts to rise; a light atmosphere, to fall. Cost of mixture, 10 or 15 cents.

New Bleaching Agent.—A bleaching liquor, patented by M. Cosse, in France, for vegetable fibres and fabrics therefrom, is formed out of a solution of chloride of lime, of variable concentration, according to the nature and strength of the fabric, in which a current of carbonic acid is injected. The chloride of lime, it is said, asserts a more energetic action than in the ordinary state, without being injurious to the fabric. The bleaching is conducted in the ordinary way, but on account of the greater power possessed by the new bleaching liquor, it allows the operation to be shortened and simplified.

Volatility of Sulphuric Acids.—A contributor to *Il Progresso* states that in operating in an atmosphere which had been dried with sulphuric acid he found that litmus paper was soon discolored and gradually disorganized. Hitherto it has generally been assumed that this acid is not volatile at ordinary temperature, and if the above statement should be confirmed it will be of some importance in both manufacture and analysis. It has been suggested that the evaporation of the acid may account for the sulphur rays sometimes noticed in Geissler tubes.

Birch Bark Rubber.—It is said that a dense, black gum may be obtained from the outer layers of the birch-tree bark by distillation, which possesses all the ordinary properties of gutta percha, and has the additional merit of resisting the deteriorating influences of air and the corrosive action of acids. This advantage makes it useful as an ingredient of India rubber and gutta percha, which it renders far more durable. Whether these statements are true remains to be proved.

Good Health.

Treatment of the Ear.

Delicate and highly nervous persons who are liable to suffer from shocks and are inclined to affections of the hearing, should live apart from the loud noises of railroads, factories, iron mills, etc. They should avoid with great care exposure to cold and damp, and especially should not wear thin shoes in walking on damp ground or saturated brick pavements. Children ought never to be struck on the ear with the palm of the hand, even in sport. Sudden deafness results sometimes from boxing the ears, as well as the rupture of the tympanum. Often the sudden jar or shock with the concussion of air on the ear drives in the stapes or inner bone, destroying its function and diminishing the sensibility of the nerves.

Teachers should try a child's hearing before blaming it for stupidity or inattention, as in not a few cases the fault results from imperfect hearing. Cold being one of the chief causes of deafness, care should be taken to fortify the eyetem against it. Especially is it necessary to guard against the liability to take cold, and this is best done by being much in the open air when it is clear and dry, and by the judicious use of cold or tepid water for bathing. In case of sensitive persons, water should never enter the ears under any other condition than warm or hot, to wash out some injurious substance.

Introducing into the ear the twisted corner of a towel, as some persons do, is particularly hurtful, tending to compress the wax upon the tympanum. Delicate persons should avoid draughts on the ears, sitting in wet clothes, sudden changes from the heated atmosphere of crowded rooms to cold winds, and other similar exposures. Tobacco smoke is injurious to sensitive nerves, and sometimes produces a peculiar diseased condition of the eustachian tube. Smoking in the open air should be especially avoided by persons whose hearing is impaired, as it injures the throat, and the opening between the throat and ear. No cotton or wool should be worn in the ears unless there is a perforation of the membrane of the drum. If there is itching of the ears, a little vaseline or cosmoline may be introduced on the end of the little finger, but never pushed in.

No instrument of any kind, steel pens, ear picks, pins, sharpened sticks, should be put in the ear; they irritate the delicate lining membrane, and in some instances pierce it. Sea bathing should be indulged in only with great care as to the temperature and the avoidance of water in the ears. If the person is not robust, the head should be protected in cold water bathing and diving by an oilcloth cap or other covering, or by a pledget of wool. If the ears are sensitive, they should be protected, if possible, by the natural covering of the head, the hair being allowed to grow moderately long. Frequent cutting of the hair very close is one of the causes of catarrhal inflammation of the ear. The feminine fashion of wearing the hair and hat on the back part of the head tends to neuralgia and disease of the ear, and should not be followed in cold weather.—*Dr. Turnbull.*

How Voltaire Cured the Decay of His Stomach.—In the "Memoirs of Count Segur" there is the following anecdote: "My mother, the Countess de Segur, being asked by Voltaire respecting her health, told him that the most painful feeling she had arose from the decay in her stomach and the difficulty of finding any kind of aliment that it could bear. Voltaire, by way of consolation, assured her that he was once for nearly a year in the same state, and believed to be incurable, but that nevertheless a very simple remedy had restored him. It consisted in taking no other nourishment than yolks of eggs beaten up with the flour of potatoes and water." Though this circumstance concerned so extraordinary a person as Voltaire, it is astonishing how little it is known and how rarely the remedy has been practised. Its efficacy, however, in cases of debility, cannot be questioned, and the following is the mode of preparing this valuable article of food as recommended by Sir John Sinclair: Beat up an egg in a bowl and then add six tablespoonfuls of cold water, mixing the whole well together; then add two tablespoonfuls of farina of potatoes; let it be mixed thoroughly with the liquid in the bowl; then pour in as much boiling water as will convert the whole into a jelly, and mix it well. It may be taken alone or with the addition of a little milk in case of stomachic debility or consumptive disorders. The dish is light and easily digested, extremely wholesome and nourishing. Bread or biscuit may be taken with it as the stomach gets stronger.

Spreading Diphtheria.—It is not alone by the breathing of infected air that diphtheria may be communicated from child to child at school. Indeed, those who deny that the air is often or ever a medium of communication of the disease, and who are at all familiar with the thoughtless ways of little children at school, must yet recognize that the possible means of communication by almost direct contact are many. Who has not seen a schoolboy with his mouth full of marbles taken from a mate? Children often borrow lead pencils, which by instinct they wet in their mouth; they borrow sponges from one another to wipe their slates, which they moisten with saliva. In so democratic a community as a primary school-room it is a very common thing for all the children of the room to drink from the same cup, their clothes commonly hang in close contact in closets and ante-rooms. They manifest their likes and dislikes by biting or refusing to bite from the same apple; and little girls often pledge eternal friendship by that classic symbol, "sharing gum." Though these things may occur outside the school, they are the more frequent the more children are brought together, as they are in schools.—*The Sanitarian.*

Sick Headaches.—Nine times out of ten the cause is in the fact that the stomach is not able to digest the food last introduced into it, either from its being unsuitable or excessive in quantity. A diet of bread and butter, with ripe fruits or berries, with moderate continuous exercise in the open air sufficient to keep up a gentle perspiration, will often cure it in a short time. One teaspoonful of powdered charcoal in half a glass of water, and drank, sometimes gives relief. And yet the above remedies will not avail in all cases. A sovereign remedy for this disease is not easily found. A correspondent contributes the following: Sick headache is periodical, and is the signal of distress which the stomach puts up to inform us that there is an over-alkaline condition of its fluids; that it needs a natural acid to restore the battery to its normal working condition. When the first symptoms of a headache appear, take a teaspoonful of lemon juice clear, fifteen minutes before each meal, and the same dose at bedtime. Follow this up until all the symptoms are past, taking no other remedies, and you will soon be able to go free from your unwelcome nuisance. Many will object to this, because the remedy is too simple, but I have made many cures in this way.—*Dr. Haire.*

To Remove Rusted Joints and Nuts.—Kerosene oil or naphtha, or even turpentine, will in a short time penetrate between minute crevices in joints that have been long in contact, whether bolts or nuts or steam joints. They should be ignited when possible, when the effects of heat and diffusion will soon loosen the metals. Nuts rust so tight sometimes that no wrench will remove them without breaking off the bolts. A gentle hammering on the sides and top will sometimes start them a little. A driven joint, or rust joint, between flanges, formed by cast iron borings and sal ammoniac in solution in them, can not be parted by any means short of destroying the castings. The scrap heap is the only remedy.

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Passing Events.

Our "Mining Summary" chronicles several strikes, and records of quick progress in many mining camps. But winter will soon lay its icy hand on many of the camps and developments be materially retarded. It is then that the districts of California, New Mexico and Arizona become greater favorites.

What was called a dshris meeting was held here this week before the Chamber of Commerce of San Francisco. The usual statsments were made hut nothing new was evolved. A committe of five was appointed to visit ths valleys and mountains and report on the question to a general meeting of citizens. Ths Chair appointed Messrs. Hawley, Duffy, Heller, Statson and Taher, all estimable gentlemen, hut not engineers, so that their opinion will he of no especial value. This was a farmers meeting and the miners will he heard at the general meeting. The Supreme Conrt of the United States mnst decide this question and the manufacturing of public opinion, which are the principal objects of such meetings, is of no practical moment.

Election day and admission day have made this week a sort of holiday one.

The days have been filled with engrossing events. Ths whols coast was thrilled with the announcsment of an Apache massacre in Arizona, and it was feared at first that a large detachment of troops had besnent and forts demolished by the redskins. Fortunately later news makes the trouble much less serious, and there is still a chance of an Apsche disturbance in the southeast which will arrest industry and davelopment of the country, and donhtless cost many lives. It is to be hoped that snch an evil will he averted.

The prisoner at Washington, pierced with a hullst, well nigh crushed by the secondary consequences thereof, and hemmed in with heat and malaria, has at last escaped to the refreshing breezes of the seashore, and will there renew his battle with death with strongsr weapons than hefore. The ride from Washington to Long Branch was successfully made on Tuesday, and the people carried lighter hearts whsn the tidings came that no ill effects from the movement were apparent. Hope for the recovery of the President is again in the ascendant.

A Gold Excitement in Georgia.

News of recent finds of gold in the heds of the rivers of northern Georgia is creating no little excitement and attracting considerable attention from ths press. Gold hss besn mined on a small scals in Georgia for nearly a century, hut the amount extracted has besn so small in comparison with the enormous yields of ths Pacific coast that probahly three-quarters of the people of ths United States are unaware of ths fact. Now, however, .ths newspapers in ths neighborhood of the recent discoveries are much exercised, and unite in predicting a grand rush to this nearly forgottsn corner of ths country. It is hardly to hs sxpected, howsver, that California, Nsvada and Colorado will bs immediatsly dspopulated from this cause, however inspiriting ths Georgisn outlook may be.

The Stats Geologist of Georgia announces that there sre now two companiss formed for ths purposs of mining ths heds of these rivsrs. Ons company was orgsnized in Boston, Mass., with a capital of $4,000,000, snd the work is to bs done by the International Vscuum Boat Dredging Company. The process to hs employsd is thus describsd hy a local papsr:

Ths mud from the bottoms of the rivers is forced, hy atmospheric pressure, through pipes resting on ths hed of ths river, on to ths deck. About five tons of mud and sand from the river beds can he delivered on the deck in ten minutes. The process is rapid, and a large quantity of mud can be thus mined in one day."

A very glittsring picture is presented hy a correspondent of the New York *Sun*, from whose letter we quote the following extract, as showing the state of enthusiasm which has been aroused in the minds of dwellsrs in this latest El Dorado :

"The beds of the Chestatee and Chattahoochee rivers ars so rich in gold that ths vsry sands on the shore yield the precious metal.

"Many small mountain streams cross large veins of gold, and these streams, flowing into the Chestatee and Chattahoochee, havs washed this precious freight from their sources for hundreds of miles. The first hoat is being hnilt near Dahlonega, and will hsgin work the middle of September. Few Georgians have dreamed of the enormous riches hsried in the gold fields of the northern part of our State, and that in so shallow a grave that our rivers now resurrect them, and literally roll over golden sands. Largs nuggsts are found on the rock bed of the rivers, and in little dips and hollows that the water has mads. The next two months will show results that will maks the cry of gold-ssekers not 'Wsstward ho!' hut 'Georgia ho!' The dredging hoats cost frcm $6,000 to $10,000 each, and the company is having them huilt as rapidly as possihle to put on all ths gold-hearing rivers. Over 20 miles of the river above mentioned have hesn leased from persons living on their hanks at ten psr cent. of the yield. These 20 milss will he an enormous mine, as the river hanks can be worked 12 or 14 ft. desp. The dredging hoat now in conrse of constrnction is calculated to take about $1,000 worth of hullion a day from the river hed."

Extraction of Gold from Sulphurets—No.1.

[Written for the MINING AND SCIENTIFIC PRESS by C. H. AARON.]

If the gold which is frequently found associated with the diffsrsnt classes of pyritss, is, as some think, entirsly metallic, it would seem that the simplsst and most ohvious method of treatment, namely, fine grinding and amalgamation with mercury, especially when aided hy the nse of some chsmical to remove from the surface of the metal any ohstructive film, shonld be effective for the extraction of the metal. But, although the simplicity and directness of this method have indnced its frequent trial, the results have heen unsatisfactory in most, if not all cases in this country, whence it appears that, eithsr ths gold is not all metallic, or the presence of the associated pyrites has a malign inflnence on the action of mercnry, or on the gold itself. An instancs is within the knowledgs of the writer, in which nnroasted sulphurets were treated profitahly hy amalgamation with addition of a considsrable quantity of sulphurio acid to the pulp; hut, as the ore was rich and ths extraction did not go much beyond 80%, the result could hardly be considersd to afford a precedent.

It is said by thoss who have tried it, that the hest results in raw amalgamation have been got hy dry grinding, with mercury, in an arastra, but the recovery of the qnicksilver is sxtremely difficult.

The nsxt most ohvious step was to suhject the ore to an oxidizing roasting previons to amalgamation. In some cases this has answsred fairly well, as much as 80% having besn got from sulphuretscontainingahont $100 to the ton. Butthe gold in roasted pyrites is usually not in a very good condition for amalgamation, and some assistance from the nse of added chemicals is requisite. Cyanide of potassium is perhaps the most effective agent for the pnrpose, and appsars to act hy dissolving an ohstructive film from the surface of the gold. But cyanide of potassium also dissolves gold, and a question worth considering is, how far there may he danger of a loss of gold from the nse of this reagent in any considerable qnantity.

In most acid and neutral menstrua, quicksilver and iron ars both positive to gold, whence ths natural supposition might he, that ths presencs of these metals would protect the gold from ths action of ths cyanids, ss they undoubtedly would from that of chlorine, for example. But ths electric relations of metals are changed in different liquids. Thus, in ths solution of chlorids or sulphate of copper, that metal is precipitsted by lead, but in a cyanids solution, lead is precipitated by copper. Again, it is stated in some works on chemistry, that iron precipitates copper from all its solutions, hut this seems to bs an srror, as it is stated on good authority, that at least ons solution exists in which copper is positivs to iron. In like mannsr, as is shown by that indefatigahls sxperimenter, Wm. S. Key, of New Zealsnd, gold prscipitstes mercury from a cyanids solntion, so that, instead of the mercury protecting ths gold in presencs of cyanide of potassium, it is ths gold which protects the mercury, of courss at its own sxpenss, and the solution of the gold is promoted by the presencs of mercury. Iron is also negstive to gold undsr this condition.

A new method of amalgamstion of gold has latsly hssn announncsd as ths invsntion of a French chemist. It consists in ths trsatment of ths auriferous matter, with a strong solution of corrosive suhlimate, in pressuce of metallic iron. It is well known that if a piecs of gold is brought into contact with a piece of iron, even in an extremely attenuated solution of corrosive suhlimate, the gold is instantly amalgamated, and this fact is the foundation of ths proposed process. The msthod may be effective, but there are considerations which would seem to militate against it. Firstly, corrosive sublimats, which is bichloride of mercury, is expsnsive; secondly, iron alone reduces it to the metallic state, so that thsre can he no certainty that every particle of the gold will come in contact with the iron hefore the whole of the corrosive sublimate has besn decomposed; thirdly, there seems to he some danger of the formation of calomsl, and consequent flouring of ths mercury, notwithstanding ths presencs of iron.

A process recently patented in England, for the treatmsnt of ores containing copper and precious metal, consists in treating the oxidizsd ore in barrels, with metallic iron and corrosive suhlimats. The dccomposition of corrosive suhlimate hy iron, prodnces chlorids of iron, which converts oxide of coppsr into chloride of copper. The latter is reduced to mstal hy iron. Both corrosive suhlimate and chloride of copper act on the silver compounds and convsrt them iuto chloride, which is reduced to mstal hy iron and copper. Thus ultimately the whole of the copper and silver as well as the mercury, which was put in as corrosive sublimate, becoms metallic, forming a dry amalgam, to which more mercury is thsn added to facilitate the collsction.

The idea of amalgamating coppsr on this principle occurrsd to the writer ssveral years ago, see *"Testing and Working Silver Ores,"* pags 32, hut was not considered fsasihle on account of the large quantity of quicksilver required.

Where lssd ore is plentiful, auriferous pyrites may he advantageonsly treated hy smelting, after a more or less partial oxidation hy roasting. The oxide of iron formsd in ths roasting is a good desnlphurizing agent for galena, and a flux for quartz. In hlast furnacss a difficulty arises from dusting, which might be obviated by mixing the roasted pyritea with clay and water, and drying ths mixture in lumps, or hy matting the material in a rsverbsratory furnace. In a revsrheratory smelting furnace, the dusting will give little or no tronhle.

Many attempts have heen mads to extract gold by passing the pulvsrulsnt ore through a hath of melted lead or zinc, and it is not very long since a person, who has .sincs made himself notorious hy a more egregious fraud, the impudence of which approaches the snblime, sndeavored to foist this old processs upon the public as something new. In regard to metallurgical processes, as in some other cases, it may he said, "hy their fruits ye shall know them," and as this process has not prodnced any tangible fruit in the 15 or 20 years of its existence, we may safely conclude that it has not heen found practicahle.

Another method, npon which experiments have heen made, is to suhject ths pyrites to heat in clay rstorts. A portion of the sulphur is suhlimsd and may he collected in condenssrs. The pyrites are changed into magnetic pyrites, which oxidizs rapidly hy exposure to air and moisture. The treatmsnt in clay retorts is too expsnsive—a reverberatory furnace with a redncing fire might possihly answer.

The principle of the Bessemer converter has of lats years been applied to the treatment of sulphnrsted ores containing gold, silver or copper. Ths constituents of the ore itself, hy their combnstion, are; made to supply ths heat for the operation; just as the carhon does in the making of Bessemer steel from cast iron. In the high temperature of the convertsr, it is found that ths ordsr in which ths different snbstsnces burn is, iron, steel, sulphur, copper, lead, so that if the hlast of air which is hlown through the molten mass hs stopped at the right momsnt, a slag and a matte are obtained, the former containing nearly all the iron, silics, stc., and the latter containing copper, lead, gold, silver, nicksl and cobalt. Lead, antimony, arsenic aud some sulphur are collected from the flues, whsre thsy condense at different distances from the source of heat, according to their volatility. This process is one of concentration rsther than of final extraction, and is therefors somewhat out of ths lins of this article; but it has so much to commend it to attention that its mention may be excused in a paper which is intended to he suggestive rather thsn exhaustive.

Ths strong tendsnoy of chlorine to combine with gold, naturally suggested its uss for ths extraction of the precious mstal from orss. The first to make this application in a practical way, was ths illustrious Plattner, by whose name ths process, as commonly worked in this country, is appropriatsly known. It has been sttempted to form the compound of gold and chlorins hy ths aid of firs, and it csu be dons, but so great is ths tendency of the chlorides of gold to decomposs under the influencs of heat, that ths method hss nsvsr, to the writer's knowledge, heen practically successful as a metallurgicsl process, although, in a form to be refsrred to hsresfter, it is recommendsd in the assay of gold qnsrtz. Ths form of chlorination introduced hy Plattner, and modified, as to ths kind of vsssels to hs ussd, by Deetken, is thst which hss givsn the bsst rsults in tho treatmsnt of auriferous sulphursts in this country, and is extensivsly used in California, and in Colorado. In this process ths combination of chlorins with gold is effected, not by mesns of heat, but by the agsncy of water, with which ths ore is slightly moistened. In order that the combination may taks place, the snlphurets must be thoronghly oxidized by msans of roasting with exposure to air, and the solnhle metal sulphates thus formed mnst hs decomposed hy continned heat, or by msans of salt. The chloride of gold whsn found, is washsd from the ors by means of water, in which it is soluble, and the gold is precipitated from this solution usually by the addition of sulphats of iron. In some cases sulphate of iron is objectionahls; we have thsn the choice of the following reagents for the purpose, namely, sulphnretted hydrogen, oxalic acid, sulphurous acid, nitrous oxide, dichloride of copper, animal charcoal (patented), wood charcoal (said to he patsnted), sulphide of copper (patent applisd for), and a numbsr of othsr substances.

Notwithstauding that Plattnsr's process is so extensively ussd, in many casss with results which leave little to hs desired as to ths extraction of the gold, it is still opsn to objection on the score of expense, and in some casss also for inefficiscncy. Roasting of the ore is imperative in ths instance of sulphurets, and this requires considerable outlay for furnaces, as well as a constant expsnse for labor and fusl. In the ordinary procedure sulphuric acid is required for the generation of chlorine, and, although this could easily hs made from the ore itsslf, yet ths plant for so doing would require an additional heavy outlay, and the production of the acid would require a knowlsdge which is not always possessed hy the operators. As already obssrved, the sxtraction of gold is sometimes very good, the writer himself having reached 98% from ore containing about $300 per ton, but in general enough gold remains in ths ore to maks a better process quite desirable, being from $12 to $20 per ton tailings. In some cases ths presence of lead, silver, etc., greatly interferes, and although this difficulty has becn skilfully met hy Ottokar Hofmann in his patent process, yet it has been at ths cost of more handling, and, therefore, grester expense. In consequence of these dsfects, inventors have not ceased their endsavors, either to contrive an entirely nsw process, or to so improve that of Plattner as to seonre a more perfect, or a cheaper extraction of gold.

Foundry Notes.

At the Golden State and Miners' Iron Works they are just completing an immense pulley for tbe Presidio Railroad Co. It is the driving pulley for operating the grip pulleys of the wire cable, this oompany intending to uss a bslt instead of gears. The hig pulley is 24 ft. in diamstsr, and weighs ssven tons. It wa cast in halves and bolted togsther. These works now have a new laths for these kind of jobs, and they can now turn a pulley 32 ft. in diametsr. The face plate to the lathe weighs six tons. The spindle to ths facs plats, which is of steel, weighs one ton.

This foundry is also engaged in working the grip pulley, sheaves, etc., for ths Presidio cable road. Tney have jnst sent a large double hoist to Utah, and are at work on a single hoist; also completing a 20-stamp mill for an Idaho mins. Considerable supply work is also heing done for Arizona, in the shspe of shoes, dies, and other castings. Ths usual amount of miscsllaneous work is on hand.

PALISADE DISTRICT, Nevada, is a new mining district about six miles west of Palisade, and a mile and a half from the lins of the Central Pacific railroad. The ore very closely resemhlcs that of the Richmond mine at Eureka. It carries a good deal of manganese and iron. Two parties are developing claims there now, and one of the ledges is eight ft. wide. Assays made in this city this week, run from $57 up to $300 per ton. The men at work will soon prove up the value of the claims.

THE Klamath river is so uncertain lately in regard to stage of watsr and current, that much tronbls has been experienced in operating the watsr whsels in the mines.

Gold Nuggets—No. 2.

[Written for the Press by Henry G. Hanks, State Mineralogist.]

The following table of remarkable nuggets is compiled from various sources, and probably contains errors. Early pioneers of California, and miners generally, are requested to communicate with the State Mineralogist, to point out mistakes that may be noticed, and to send descriptions of those not mentioned in this list. From the information so obtained a corrected catalogue will be prepared.

Where the weight only has been published the value has been calculated on an assumed fineness of 900. Of course such a calculation is only approximative, it being impossible to know the actual fineness. Where the value only has been stated, the weight has been obtained by reversing the calculation.

The first piece of gold found in California by James W. Marshall, weighed 50 cents; and the second, $5. They were both paid out for provisions, and all trace of them lost. It is, therefore, impossible to show the first piece of gold found in the State, and it is to be hoped that we shall not soon see the last.

The discovery of the first specimen of gold remarkable for its extraordinary size, plays a prominent part in the early history of California. The official news of the discovery of gold in the State was taken to the Government by Gen. E. F. Beale. He went to Washington, bearing about $50 worth of gold dust, but failed to excite the interest he anticipated, and returned rather disgusted. During his absence, the historical mad rush to California from the ends of the earth had begun, and he found San Francisco in a wild state of excitement. He arrived late in the summer of 1848. About that time a young soldier of Stevenson's regiment, while riding along the Mokelumne river, stopped to drink from a stream, and discovered a gold nugget, weighing between 20 and 25 lbs. He hastened to San Francisco and placed his prize in the hands of Col. Mason for safety, who sent it by Gen. Beale to the Eastern States, the exhibition of which in New York fanned the smouldering flames, and the nation began to realize the importance of newly acquired California.

In November, 1854, a mass of gold was found at Carson hill, Calaveras county, which weighed 195 lbs. Troy, or 2,340 Troy ozs., the value of which, assuming the gold to be 900 fine, was $43,534. This is the largest piece of gold ever found in the State. Several other nuggets, weighing from six to seven lbs., were found at the same locality.

On the 18th of August, 1860, a large piece of gold was taken from the Monumental quartz mine, Sierra Buttes, Sierra county, which weighed 1,596 ozs. Troy, the value of which was estimated at from $21,000 to $30,000. The mine was owned by Wm. A. Farrish & Co. The nugget was sold to R. B. Woodward, of San Francisco, on the 4th of September, 1869, for $21,636.52, and placed on exhibition at Woodward's Garden, where it attracted much attention. By an unfortunate circumstance, no cast was ever made of it. It was melted and sold October 7th of the same year, yielding only $17,654.94—an example of the universal habit of overestimating the value of such specimens. The Monumental mine had yielded $70,000 worth of gold at the time of the discovery of the nugget.

Mr. Strain found a large slab-shaped gold quartz nugget near Knapp's ranch, half a mile east of Columbia, Tuolumne county, which weighed over 50 lbs. avoirdupois; it was about 14 inches long, 9 inches wide at one end, and 5 at the other. The sides were nearly parallel. When broken up, gold was separated from the quartz which was melted into a bar weighing 396 ounces, and sold for $7,500. The rock was then crushed in an iron mortar and panned out. The result was gold to the value of $1,000 more. This specimen was found in a small trail leading up the slope of the hill from the gulch, and hundreds of miners had walked over it without notice. Near the same locality others found pieces worth a few hundred dollars, but the pocket or vein from which it came was never found.

In 1855, at French Ravine, Sierra county, a nugget was found which weighed 532 ozs., and was worth $10,000. It contained considerable quartz, which is not calculated in the weight.

In the year 1867, at Pilot hill, El Dorado county, a bowlder of gold quartz was found, which sold for $8,000. The estimated weight of gold was 426 ozs. Troy.

In 1851, at French ravine, Sierra county, a gold nugget was found which weighed 426 ozs., and was valued at $8,000.

Mr. Virgin and two other miners found a nugget of gold on Gold hill, near Columbia, Tuolumne county, which weighed 360 ozs. The value of the piece was about $6,500. It was somewhat oblong in shape and worn perfectly smooth. On one side there was a deep cut as if the mass had been formed in contact with a sharp rock. The gold was bright and had the general appearance of a small meteorite. It was found two and one-half ft. below the surface, imbedded in red clay.

In 1853, a mass of gold weighing 283 ozs., and valued at $5,265, was found at Columbia, Tuolumne county. My informant saw it weighed at Mille hankiug house in Columbia.

A nugget is reported to have been found at Minnesota, Sierra county, weighing 266 ozs., and valued at $5 000. No other particulars have been obtained.

In 1850, a piece of gold quartz was found in French ravine, Sierra county, which contained 263 ozs. of gold worth $4,893.

A Frenchman found a nugget of gold in Spring gulch, near Columbia, Tuolumne county, which was nearly pure gold. It was worth more than $5,000. The mass was somewhat coated with oxide of iron when first found. It was globular in shape. The discovery of this nugget proved to be a great misfortune, for the finder became insane the following day and was sent to Stockton. The French Consul recovered the nugget or the money obtained for it, and sent it to his family in France.

A nugget, said to have been pure gold, was taken from the Middle Fork of the American river, two miles from Michigan Bluffs, in the year 1864, which weighed 226 ozs. and was sold for $4,204. Another account of this nugget states the weight to have been 187 ozs.

In 1855, at Remington Hill, Nevada county, a nugget of gold was found which sold for $3,500; the weight, estimated from the value, was 136 Troy ozs.

At Smith's Flat, Sierra county, in 1866, a piece of gold was taken from a claim which was worth $2,716 and weighed 146 ozs.

At Smith's Flat, Sierra county, in the year 1864, a nugget was found of 140 ozs. weight and worth $2,605.

No date is given in an account of a gold nugget found in a gulch near Klamath river and Groot's Ferry, Siskiyou county. Its weight is stated as 131 ozs. and its value $2,437.

A second piece of gold of unusual size was found at Remington Hill, Nevada county, in 1867, which weighed 128 ozs. and was valued at $2,400.

In 1869, a nugget was found at Little Grizzly Diggings, Sierra county, which weighed 107 ozs. and was worth $2,000.

A cluster of beautiful dendritic crystals of gold was found in August, 1865, in the Grit claim, Spanish dry diggings, El Dorado county, which weighed 101.40 ozs. Troy, the value of which was $3,500. It was taken from a tunnel 200 ft. below the surface. It was sold and sent to New York, where a French gentleman, Mr. Fricot, formerly of Grass Valley, bought it, and by him it was taken to Paris. In all probability it now graces some foreign museum. It should have been preserved in our own. A fine photograph of this beautiful specimen has been presented by Mr. Arthur M. Hickox to the State museum, where it may be seen by those interested.

A nugget of gold weighing 94 ozs. was found in the Hope claim, four miles below the Mountain House, Sierra county, valued at $1,770, the name of the finder and the date are not given.

In 1854 a gold nugget was found by Frank Russworm, in a claim 2 miles south of Campo Seco, Calaveras county, at the head of Stone Cabin gulch, on the bedrock, 20 ft. from the surface. Weight 93 ozs., value $1,760. It was sent to the mint soon after being found.

In 1860, at French Ravine, Sierra county, a nugget worth $1,757, and weighing 93 ozs. was found.

In 1861, at Smith's Flat, Sierra county, a gold nugget was found, which weighed 80 ozs., and was valued at $1,509.

At Lowell Hill, Nevada county, in 1865, a 53 oz. nugget worth $1,100 was found.

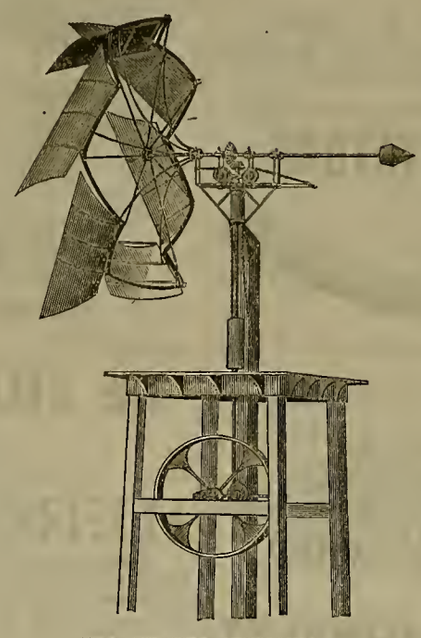
There is a model of a gold nugget in the State Museum from Oregon canyon, El Dorado county. Mr. Caleb T. Fay of San Francisco, thinks this nugget is one that he bought in 1850 for $1,250 and sent to Boston, where it was placed on exhibition in the counting room of Dexter, Fay & Co. Mr. Fay will write to Boston to learn if a coast was made of it at the time. The nugget was found by Alonzo Kinsley.

A beautiful nugget of crystallized gold was exhibited at the Paris exposition of 1878, in the Pacific coast collection, which attracted much attention. It weighed 13 ounces. Its intrinsic worth was $248; but as a beautiful mineralogical specimen, it was far more valuable. It was from the Banghart mine, Mad Mule canyon, Shasta county, and was exhibited by Samuel Cooper.

What are known as pocket ledges are common in California. By this may be understood quartz veins, in which rich spots occur, and from which large amounts of gold are sometimes taken from a comparatively small space. No calculation can be made as to the extent of these pockets, or as to the reasonable expectation of finding another when one is exhausted. A remarkable deposit of this nature has lately been developed in the Rainbow mine, Sierra county. A fine specimen has been on exhibition at the office of H. H. Noble, in San Francisco. It was a slab of gold quartz, which was calculated to contain $20,468. It was taken from a depth of 200 ft. The whole shipment from the pocket has been 1,953 lbs., and the total yield at the time of writing, $116,337.

From 1854 to 1862, 12 gold nuggets ranging from 30 to 170 ozs. were taken from the Live Yankee claim at Forrest City, Sierra county.

From 1856 to 1862, a number of gold nuggets varying from 30 to 100 ozs. were found in the Oregon claim at Forrest City, Sierra county.



THE BEAVER WINDMILL.

In Holden's Garden, in Sonora, Tuolumne county, in the year 1850, a mass of quartz and gold containing $30,000 worth of gold was found.

A New Windmill.

Joseph H. Therein, of this city, has recently patented through the Mining and Scientific Press Patent Agency, and exhibits at the Mechanics' Institute Fair, an improvement on windmills, which we illustrate on this page. It consists of a novel exterior rim for the wheel, to which the vanes are attached and hinged, the rim being made in zig zag sections, and having the arms or spokes of the wheel extending from the hub to the angles of these sections, so that they stand alternatively forward and backward from a plane and thus brace the rim.

The vanes are also formed in a novel way, being curved similar to a plow share, and are hinged to the angular joint, so as to stand diagonally with the plane of the wheel and they may be adjusted to the strength of the wind by means of arms connected with a sleeve sliding upon a shaft. Mr. Therein also devised a peculiar socket by which the mill may be mounted on a single post; this socket having a vertical spindle upon which the wheel axle and upper part of the mill is mounted to swing about as the wind may make it necessary.

The engraving shows very clearly the construction of the mill, the fans of which are metal. The whole mill in fact is of iron, either painted or galvanized. A weight acts on a governor and may be proportioned to get more or less speed. The weight closes the vanes toward the center and when the force of the wind overcomes the weight it forces the vanes outward and reduces the power and speed of the wheel. This mill is called the Beaver Windmill. For the large-sized wheels cloth will be used instead of metal. An 8-ft. wheel will give one horse power, and costs $75; 10½-ft. wheel, two horse power; 12-ft., three horse power; 15-ft., five horse power. The inventor's address is corner 30th and Mission Sts. The inventor informs us that the mills he has built, and which are in practical operation, are in every way satisfactory.

Success of the Mechanics' Fair.

The sixteenth industrial exhibition of the Mechanics' Institute, which closes this week, has been eminently successful from every point of view. As a business proposition the financial result has been all that was expected. The attendance was greater than last year, and the visitors have apparently appreciated the efforts of the management to please them.

As an exponent of our industrial progress the exhibition may also be considered a success. This was evidenced by the great variety of articles exhibited as shown in the catalogue published in the Mining and Scientific Press last week. To those who have never given the subject thought, few would believe that such a variety of products were manufactured here. San Francisco is, of course, the industrial center of the coast, as it is the financial center, and most of the industrial and manufacturing establishments are here; but other towns are also coming to the front in special branches, and have showed their products at this fair.

It is the manifest intention of the managers of these exhibitions to make them popular in every way, and the music and the pictures, candy stands, soda fountains, restaurants, etc., etc., all do their share. But there is a strong practical undertone and abundant evidence that it is to our industrial progress that the fair is principally devoted. The manufactured articles and substances, natural products, machinery, etc., etc., take prominent places, and, in fact, are the features of the fair.

Many, of course, visit the place to whom such things are of little interest, but most of the visitors come away impressed with the feeling that they have been in some way instructed; that they have, unconsciously perhaps, absorbed a certain amount of information which has done them good. Those, who only knew of the ordinary 10-stamp mill have seen a dozen other ways of grinding quartz; those who knew only of the pan and rocker, have seen other ways of saving gold. People who imagined their house fully furnished, came across dozens of useful things they never heard of before. The anxious housekeeper has seen varieties of stoves and household implements and handy little things for every day use that she might never have ever heard of unless she had visited the fair; and so in everything.

Altogether, these industrial exhibitions are good for us in every way. They are good for the exhibitors, too. In the first place, they get the very best kind of advertising. They show their goods in holiday dress to the people who are to buy said goods. Then rival manufacturers see the defects of their own in the superior points of excellence of others, and find they, too, must improve to keep pace with the march of events.

The great public, for whom all this display is made, by frequent visits, get interested in one thing and another, and make a point of studying up those things which they find interests them. It is impossible to spend many hours in such a place and not learn a good deal which will at some time or other be useful to one. And, moreover, the attention of inventors is often called to needed improvements in certain branches of mechanics. Some shrewd people of inventive turn of mind can see a means of overcoming a difficulty when their attention is called to it, which, perhaps, would never occur to men who have run too much in one groove.

Thus, all are benefitted in benefitting the library. The gentlemen who conduct these exhibitions are public spirited citizens, who do not get the credit they really deserve. They get no compensation whatever in any way. They give a great deal of valuable time to arranging the details and perfecting the exhibition. People have become so accustomed to having this done for them that they do not appreciate the efforts it takes to have such an exhibition. It is not a State institution. It gets no subsidies. No State board of managers provide for it. Yet this annual fair has now become recognized as the best we have on the coast. And it is mainly due to the disinterestedness of the managers. There are only the bare expenses to be paid, with no sinecures to load it down. The funds are turned over to increase the library of the Mechanics' Institute.

We are glad to be able to record the success of this fair. It is the last which will be held in the old building. Next time there will be a better place for it in every way. The Board of Managers will prepare and publish for public distribution, a full report of all matters connected with the fair. Exhibitors have been requested to forward to the Secretary, J. H. Culver, such written or printed matter as will explain the exhibits. It is to be hoped this will be done, as the report is a valuable one for reference.

Speaking of the Beveridge district, the Inyo *Independent* of August 27th says: The Keynot mine continues to produce astonishingly rich gold ore. Taylor & McEvoy's 5-stamp mill made a practical clean-up during the past week, after an eight days' run, and obtained $10,000 in gold bullion as a result. The Keynot is proving to be a first-class mine, it having already produced about $75,000, with a comparatively small extent of development.

The Florence *Enterprise* says the Leroy mine, at Mineral Hill, has been bonded to San Francisco parties for $75,000.

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This Furnace is Constructed with two SEPARATE HEARTHS, one for DESULPHURIZING and one for CHLORIDIZING the Ore.

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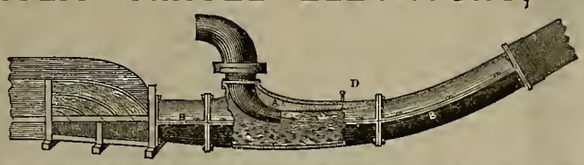

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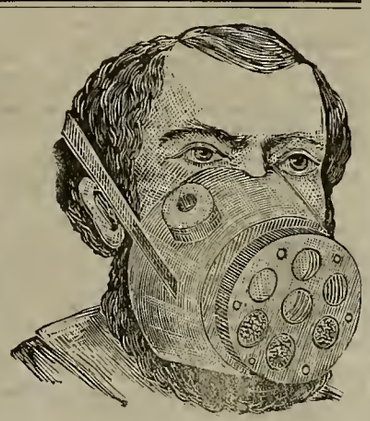

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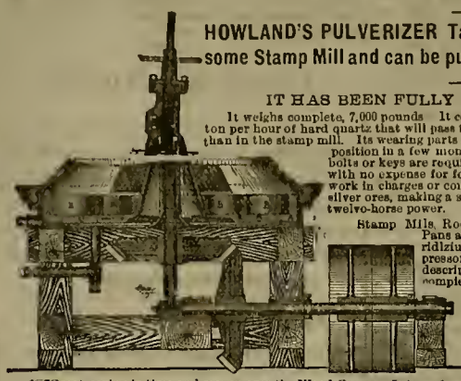
H. DEGROOT, Sr. F. E. BIRGE. H. DEGROOT, JR.
DeGROOT, BIRGE & CO.,
Mining Engineers & Assayers,
Examination of and Reports on Mines a Specialty.
No. 331 Montgomery Street, Room 28.
SAN FRANCISCO.

NOTICE.
The office of the STETEFELDT FURNACE CO., having been removed to New York, parties wishing to obtain information in San Francisco about the Stetefeldt Furnace will apply to Messrs. Prescott, Soott & Co., Union Iron Works, San Francisco. C. A. STETEFELDT.

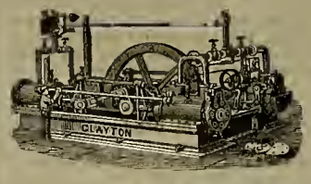
SHEET IRON PIPE.

FRANCIS SMITH & CO.,
Manufacturers of
THE PATENT CHANNEL IRON WHEELBARROWS.
THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand
SHEET IRON PIPE.
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Artesian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.
Office and Manufactory, 130 Beale Street, San Francisco.

SHEET IRON PIPE.

MOREY & SPERRY.
MANUFACTURERS OF
Gold and Silver Grinding and Amalgamating Machinery

HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.
IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill. It requires twelve-horse power.
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies. Iron Work complete for Wood Frames, also
SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.
☞Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
MOREY & SPERRY—Warerooms, 92 and 94 Liberty St., N. Y.

CLAYTON AIR COMPRESSORS,
—AND—
INGERSOLL ROCK DRILLS.

INGERSOLL ROCK DRILL.


CLAYTON AIR COMPRESSOR.
Having been appointed Sole Agent for this Compressor, I will keep a full stock of the different sizes in store. Prices much less than any First-class Compressor in this market.
☞SEND FOR CATALOGUE.☜
GEO. R. FOARD,
Sole Agent for the Ingersoll Rock Drill and Clayton Compressor Co.
18 First Street, San Francisco.

LEFFEL'S IMPROVED WATER WHEEL.

PRICES REDUCED!
PATENTS REISSUED 1868.
The "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.
Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
JAMES LEFFEL & CO., Springfield, Ohio, and 110 Liberty St., N. Y. City.
PARKE & LACY, Sole Agents, 21 and 23 Fremont St., S. F.

STEEL CASTINGS
FROM 1-4 TO 10,000 lbs. WEIGHT.
True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
CRANK SHAFTS, SHOES, DIES and GEARING specialties.
Circulars and Price Lists free. Address
CHESTER STEEL CASTING CO.,
Works, CHESTER, Pa. 407 Library St., PHILADELPHIA

IRRIGATION! LAND RECLAMATION.
The Turbine Pumps.
3,000 to 15,000 Gallons a Minute. Strong, Durable & Cheap.
SAN FRANCISCO TOOL CO., No. 21 Stevenson St., San Francisco.

SELBY SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.
Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

Mines and Mining Properties Solicited for Sale.
I have unexampled facilities for rapidly placing Mines and Mining Properties, and claims of
Ascertained Value
Upon the Market, through my Branch Offices in
NEW YORK, BOSTON, PHILADELPHIA, CHICAGO, ST. LOUIS, LONDON, ENGLAND.
OWNERS OF
Meritorious Mines and Prospectors
WHO HAVE NOT THE MEANS TO PROPERLY DEVELOP THE SAME MAY FIND A PURCHASER THROUGH MY OFFICE.
If You Have a GOOD MINE, or a GOOD PROSPECT for sale, apply to me in person or by letter.
JAMES. A. MARS,
49 Merchants' Exchange, California Street
SAN FRANCISCO, CAL.
REFERENCES:
London and San Francisco Bank, S. F., Cal.
Anglo-California Bank, S. F., Cal.
John J. Valentine, Superintendent Wells, Fargo & Co.'s Express, S. F., Cal.
J. B. Haggin, Capitalist, S. F., Cal.
Louis A. Garnett, Capitalist, S. F., Cal.
Daniel Meyer, Capitalist, S. F.
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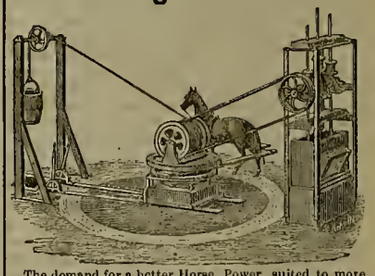
New Mining Horse Power.

The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
Agent and Manufacturer of Mining Machinery
18 and 20 Fremont St., S. F.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

FEED WATER HEATER AND CONDENSER FOR STEAM BOILER.—Reese Lewellyn, S. F., assignor to Lewellyn Steam Condenser Manufacturing Co. Dated, Aug. 16, 1881. No. (reissue) 9,340. The invention relatee to an apparatue for freeing water fed to steam hoilere from earthy matters held in solution therein—such ae carbonate and sulphate of lime, magnesia, and the like—and for ntilizing at the eame time the otherwise waete-heat of the exhaust steam. It conciets firet and essentially of a chamber provided with a maes of loose stonee, prohably oobble-etones, supported in said chamber in such a manner ae to prevent the free passage of water and etcam through and among all the stones, witb a pipe in the upper part of eaid chamber, adapted to snpply the water in a uniformly diffnsed state over the entire mass of etones, adapted to diffnse in like manner the steam upon the lower enrface and cause it to pase up through tbe mase, whereby the ealts and other matters—euch as carbonate and sulphate of lime and magnesia and silica held in solution and producing scale in the hoiler—are precipitated upon the etones and the heat of the eteam utilized. It coneists in the second place, in injecting tbe steam horizontally into the lower part of the chamber underneath the etone, wherehy it is more uniformly diffueed, hrought into immediate contact with and caused to penetrate every part of the mase of stones and approximately to heat all parts alike. It coneists thirdly, in placing among the etones a layer of filtering material, thereby comhining a precipitating and filtering apparatus in one chamher.

BROOM.—Geo. Hall, Santa Rosa. Dated August 30, 1881. No. 246,500. In that class of brooms in which the handle projects from the broomhead in a line with the length of the hroometraws, the angle at which the handle is held in eweeping brings only one corner of the hrush portion of the hroom into action, so that the corners of the broom eoon hecome distorted and unevenly worn, and the broom ie rendered unfit for use. The object of the invention is to adapt thie clase of brooms to the eweeping position hy arranging the hrush or sweeping end so that it will hear uniformly upon the floor along its whole length at the eame time that the broom handle is held in the usual nosition. To do thie, Mr. Hall counteracts the angular position of the handle hy giving to the brueh or sweeping edge a corresponding angle.

INSECT-PROOF CLOSET AND SAFE.—Chas. H. Larrahee, Napa. Dated Auguet 30, 1881. No. 246,397. Tbis invention relatee to an improvement in cloeets, meat eafee, or other eimilar devicee, wherehy they may he kept from ante and other insects, and also thoroughly ventilated whenever neceesary. It coneists of a closet or safe, in comhination with a eupplemental hollow baee which is adapted to contain water, the main closet being rigidly attaohed to the hase hy means of pillars or supports which stand upon the bottom of the concave haee, so that the whole forms one structure, while the outer walle of the cloeet extend downward aronnd the base without touching it, wherehy the tank is concealed from view. The hottom, shelves and top are perforated, to allow a circnlation of air and ventilation, and a hinged cover ie fitted to close the top entirely when desired.

DREDGING MACHINE.—H. B. Augell, S. F. Dated Aug. 30, 1881. No. 246,362. This invention relates to the class of dredging machines, and more especially to certain improvements thereon, consisting in peculiarly conetructed irone or nose piecee for receiving and strengthening the ladder timhers, the said timhers having baile attached thereto at certain intervals, provided with pulleye, over which pasees the chain oonnected with the gipey or windlase. A peculiar hopper is connected with the elbow of the discharge pipe by a swivel joint; said elhow being supported on a pivot pin on a step helow, while the pipe is supported on a turn-table, and has a door or opening for the purpose of introducing water to clean it. The object of these improvements is to ohviate certain difficulties to each part particularly.

CART.—DeWitt C. Putnam, Petaluma. Dated Aug. 30th, 1881. No. 246,555. This invention relates to that class of carts known ae hreaking carts and ie an improvement on one invented hy the samo patentee eome time eince. The object of this invention is to provide a cart which shall emhody lightness and strength and a convenient mode of access, theee objecte being accomplished by certain attachments which eupport a foothoard in front, as in the former invention, and by the further improvement of eaid attachments and appropriate construction thereof, the inventor providee a meane of supporting a suitahle step hehind, wherehy the vehicle ie adapted to be entered from the rear and may afford convenient accese.

NEW life is heing inetilled into many of the old mining camps in Utah which contain vast quantities of low grade smelting ore. The jump in lead ie doing tbe old camps proud.

Models and Records of Inventions.

The collections of models exhibited hy Dewey & Co., at their staud in the Mechanics' Fair pavilion, is only indicative of the Patent Office hranch of their bueiness. It by no meane represents eitber a variety or number of patented articles, and in fact not one hundredth part of the really ingenious models of anticipated inventione hrought to their office during the past few yeare.

Most of theee inventions were patented hy others before their (secondary) discovery hy the inventors of these models. By bringing them to Dewey & Co, an experienced and well posted patent eoliciting firm, they were promptly informed of their previous discovery, and eaved the expense, time and anxiety of finding out by applying for a patent and being rejected. In many inetancee Dewey & Co. are ahle to show almoet instantly the exact deecription and drawing of such inventions printed in their patent library. On the other hand, if many of the applications had heen made to less experienced or lese conecientions agents, the inventors wonld prohahly have heen innocently or intentionally led to apply for patents and have met with vexation, delay, neelees expense and final rejection.

However, the great merit of a patent agency does not lie in its collection of models hy any means, hut rather in its archives. In the patent office of Dewey & Co., there are etored the original records of Pacific Coaet inventions for years and years hack. The original specifications and reference lettere relating to nearly all the prominent patentee ever taken out on this coast, are in this office, duly claesified, indexed and arranged ready for reference. Having prosecnted these original cases before the United States Patent Office, Dewey & Co. are familiar with all that has ever heen done before, and can advise clionts of prior inventions and often save them the expenee of a frnitless application.

In each of the claeeified and indexed envelopes containing the original specifications and papers, aro also recorded the views aud opinions of the patent offioe examiners, with reference to the respective inventions. Theee indicate all inventions previously patented, of like charaoter. Theee records are therefore invalnahle as showing what has been done hy others in the eame line. It is the posseeeion of euch archivee that partly accounts for the long-continued and marked succese of Dewey & Co. in proeecuting cases hefore the Patent Office, since, instead of hlindly groping in the dark, they are enahled intelligently to judge of the merits of a case before they submit it, thne eaving hoth time and money to the inventor.

News in Brief.

DELMONICO, the famons New York caterer, is dead.

THE *Free Press* calle for an ice factory at Ynma.

THE distnrbancee in Tnnis are constantly increaeing.

SOLANO county has 500,344 acres, asseeeed at $6,156,720.

THE public echools of Jersey City are closed on account of the intenee heat.

AT preeent there are about 126 prieoners confined in the Nevada State Prison.

GATHERING wild plume is one of the occupatione of picnickers in Sierra connty.

FOUR heare were killed at Webber Lake last week. The higgest weighed 400 lbs.

BEES and hirde are rnining tbe early grape crop in perts of Los Angelee connty.

THE Miners' Union is about to erect a hall in Butte, Montana, at a oost of about $8,000.

A PLENTIFUL rain has fallon in Mysore, India, and the harvest prospects are mnch improved.

AT Tnckee, rohine are rated as game hirds; at Virginia City doves are in the eame category.

THE 30 milee of water ditches at Cedar creek, Placer county, are heing inepected and enlarged.

THE Chineee denizens of Stockton are hnilding a new Joes honee whioh will cost $10,000.

IT is estimated that the wheat product of Minnesota this year will amonnt to 33,771,511 hnshele.

NOTHING important has yet heen discovered in regard to the attempted train rohhery in Placer county.

ENERGETIC movements are heing made hy the German government against the Anti-Jewish ontrages.

IT is said that 35 familiee from the Oneida commnity of New York have purchased lande near Santa Ana.

SHERMAN & Reynolds, St. Johns, Colnsa Co., have thrashed 42,000 eaoks of wheat from their rented lande thie year.

A WOMAN rode 10 milee at Council Blnffs, Ia., Saturday, in 21 minutes and 49 seconds—the faeteet time on record.

THE reported massacre of Carr's command in Arizona turne out to he not true, that officer so reporting at headqnarters.

THE 100th anniversary of the fonnding of the Pueblo de los Angeles wae celebrated at Loe Angelee in grand style.

THERE are 17 tax-payers in San Joaquin aseeseed at over $100,000, and 15 aeeeesed at hetween $50,000 and $100,000.

PLACER connty containe 330,298 aores of land of a total aseessed value of $4,238,038. Total value of all property is $8,887,921.

IT ie reported that the North Pacifio Coast railroad has been eold, and that its new owners are to make extensive improvements.

FLOWING wells of good, soft water are heing etruck at various pointe in the town of Santa Barhara, at a depth of from 45 to 72 feet.

THE drouth continnes in certain eections of the South, and in Virginia and North Carolina great damage to the crops has heen sustained.

THE new town of Garfield is located 16 miles northeaet of Colfax, W. T., and 8 miles southwest of Farmington, on a beautifnl plot of rich, level land.

IT is said there ie a band of from 100 to 150 antelopes on the north eide of Kern river, and that they come within eight or ten milee of Bakersfield.

THE grain receipte at New York hy rail are 5,000,000 hnshels more thie year than last, though the total receipts hy rail and water are ahont 7,300,000 lees.

VANDALS have destroyed most of the gnideboards in the Yellowst one National Park, and the Montana papers ask to have new and more enhstantial signs erected.

Traveling Agents.

We want eeveral canvaseing agente who will make it their bueineee to solicit subscriptione and advertising for our first-clase progreseive newepapers. Men of ability and experience can secure good pay and permanent employment. Send references and state your past occupation, eto., to tbe publishers of this paper.

Suburban Residences in Oakland.

In our travels throughout the length and hreadth of this State, we bave often noticed tbe remarkable number of the people with whom we have come in contact who express a desiro to be able at some not distant day to purchase a home in Oakland—tbe city of schools, of delightful residences, of constantly enjoyable climate, avoiding the extremes of heat and cold so often met with in other portions of this State, and especially to be selected for a choice spot for a home from its proximity to the great business city of San Francisco, while it avoids its fierce winds, its ocean fog, and its great noise and turmoil.

Remembering theso desires of our numerous readers throughout the State, we think we cannot render them a better service than by calling their special attention to one of the very finest pieces of property for

Suburban Residences

We have ever seen offered on this coast. It has an altitude of about 100 ft. above tide-water; the breezes which blow directly off the bay of San Francisco come laden with health and enjoyment, while the ever-delightful views of hay and mountain side, city and valley, are a source of continual pleasure.

From the elevated portions of this property, the eye takes in at a glance the beautiful city of Oakland—a nest of homes embowered in trees and flowers; the distant city of San Francisco, which looms up as the great mart of commerce, with its wharves and shipping, its numerous steamboats and ocean steamers; the beautiful bay; the Golden Gate with its open portals welcoming the ships and the people of the whole world; the islands dotting the bay; the long lines of steam cars continually coming and going crowded with passengers; the beautiful homes in the valleys and on the hill-sides, and the spurs of the coast range of mountains for a quiet background to the picture. In all these scenes can he found a source of pure enjoyment of which one can never tire, and of which the owners can never be deprived.

This property is well named "Oakland Hights," and it is destined to be one of the very choicest of all the delightful residence sites of this city of homes.

Who would not like to have his home in such a place, within 15 minutes' drive of the center of Oakland, within an hour of the great city of San Francisco, in a climate so genial that the orange and the fig will flourish, in a city noted for its public and its private schools, with the State University almost within sight, with Lake Merritt, one of the most beautiful sheets of water on the coast, immediately adjacent, furnishing splendid facilities for rowing and sailing, with beautiful drives by winding roads not only through this tract but stretching away for miles in every direction, constantly opening up new scenes and distant views which furnish ever constant sources of delight.

Every facility will be offered for obtaining pure water, the gas pipes from the city of Oakland will be extended through the tract, and the arrangements for sewerage will be perfect. And when we come to examine this property in a pecuniary point of view, either as to the prices now asked for the lots in it, or as to their prospective value as an investment, these considerations greatly add to its desirability.

The prices now asked are not only extremely low, but if a purchaser erects his home within a reasonable time, a large rebate in coin is given to him; while as to the future, when Oakland becomes the large business city, which it is sure in time to do, this tract will be the more eagerly sought after for the residences of its wealthy citizens.

Whoever of our interior friends are thinking of Oakland as their future home, and as the place to enjoy life and to educate their children, should by all means make an early visit to this tract, and secure a home site while the present great advantages in choice of lots, in price and rebate are offered.

The Oakland agents are the well-known real estate firm of A. L. Gladding & Co., 483 Ninth St., from whom maps, circulars, and all information concerning this property can be obtained free on application, by mail or otherwise.

The 16th Industrial Exhibition.

OF THE

MECHANICS' INSTITUTE.

OF SAN FRANCISCO,

Opened Tuesday, August 2, 1881

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Our Agents.

OUR FRIENDS can do much in aid of our papor and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. MCGREW—Santa Clara county.
M. P. OWEN- Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuha and Sutter counties.
D. W. KELLEHER—San Matoo and Santa Clara counties.
C. E. WETMORE—Alameda county.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F.D., at this office.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We will send it, on trial, at the rate of $4 per annum for any period the reador may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accesions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

$40 RIFLE FOR ONLY $15.—The Evans 26-shot Sporting Rifle, advertised by E. G. Rideout & Co, 10 Barclay street, is a great bargain We are positively assured that the retail price of theso Rifles was $40 each; any one can get the same Rifle now hy sending to the above named firm only $15. They offer to refund the money sent if the Rifle is not as roprcsented. Read their large advertisement in this issue.

BOUND VOLUMES OF THE PRESS.—We have a few sets o the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and eather binding, $5. Tbeso volumes, complete, are scarce and valuable for future reference and library use.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

ANNUAL STATISTICIAN of 1881.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 816 California st. Price, $4.

San Francisco Metal Market.

[WHOLESALE.

WEDNESDAY, September 7, 1881.

IRON.—	
American, Pig, soft, ton	— @30 00
Scotch. Pig, ton	— @25 00
American White Pig, ton	— @— —
Oregon Pig, ton	— @26 00
Clipper Gap, White	— @28 00
Clipper Gap Car Wheel	— @35 00
Refined Bar	4½@ 8
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	— @ 9½
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	16 @ 18
Black Diamond, ordinary sizes	13 @ 15
Drill	15 @ 18
Flat Bar	— @ 16
Plow Steel	15 @ 16
COPPER.—	
Ingot	— @ 52
Sheet	— @ 20
Sheating, Tinned 14x18	— @ 42
Nails	— @ —
Bolts	38 @ 42
Old	— @ 18
Bar	— @ 22
Cement, 100 fine	— @ 15½
LEAD.—	
Pig	— @ 4½
Bar	— @ 6
Pipe	— @ 8
Sheet	— @ 9
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES.—	
10x14 I C Charcoal	— @ 7 50
10x14 I C Coke	6 00 @ 6 25
Banca Tin	— @25 00
Australian	— @22 00
I. C. Charcoal Roofing 14x20	— @ 7 25
" " " 20x28	20 00 @21 00
ZINC.—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS.—	
Assorted Sizes	3 50 @ 3 75

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending September 6, 1881.

HIGHEST AND LOWEST BAROMETER.

Aug. 31	Sept. 1	Sept. 2	Sept. 3	Sept. 4	Sept. 5	Sept. 6
30.063	29.998	29.956	29.975	29.883	29.761	29.900
29.981	29.931	29.919	29.883	29.667	29.667	29.761

MAXIMUM AND MINIMUM THERMOMETER.

62 / 53	61 / 54	62 / 54	62 / 54	69 / 54	68 / 54	66 / 53

MEAN DAILY HUMIDITY.

80	82.3	84	81.7	70.7	84	84

PREVAILING WIND.

W	W	W	W	W	W	SW

WIND—MILES TRAVELED.

312	354	438	318	179	250	301

STATE OF WEATHER.

Clear	Fair.	Clear.	Clear.	Clear.	Fair.	Foggy.

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1881, —— inches.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Consolidated Virginia Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Virginia Mining District, Storey County, State of Nevada.

Notice is hereby given that, at a meeting of the Board of Trustees, held on the twenty-second (22d) day of August, 1881, an assessment, (No. 16) of Thirty (30) Cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, 309 Montgomery street, Room 26 (Nevada Block), San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-fourth (24th) day of September, 1881, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on Saturday, the twenty-second (22d) day of October, 1881, at the hour of eleven (11) o'clock A. M., at the office of the Company, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

A. W. HAVENS, Sec'y.

OFFICE—Room 26, No. 309 Montgomery street (Nevada Block), San Francisco, Cal.

The Oxford Beta Tunnel and Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Aurora, Esmeralda County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the Twentieth (20) day of August, 1881, an assessment, No Twenty-nine (29), of Twenty (20) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Rooms of Dr. Knowles, 118 Dupont street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the Twenty-sixth (26) day of September, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the Seventeenth day of October, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. H. PEOK, Sec'y.

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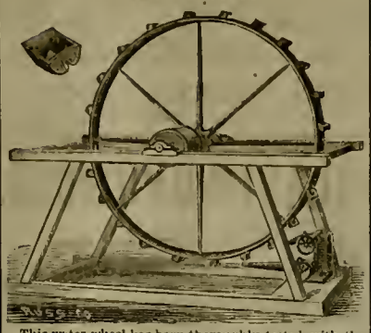
(Patented, Oct. 26, 1880.)



This water wheel has been thoroughly tested with the Dynamometer, and utilizes 73% of the theoretical power; and underheads of water of 75 to 300 ft is guaranteed to give better satisfaction than any Turbine or other wheel ever offered to the public. The above per cent. is due to the peculiar shape of the buckets used. They do not reduce the water to a spray, but divide and deflect it outward and backward, in such a manner that a part of the impact and the whole reactionary force are utilized, without any part of the water coming in contact with the bucket following. Furthermore, the per cent. of efficiency remains constant through great variations in the amount of water used. These buckets can be taken off in transportation, and can be replaced by new ones when worn out by sand in the water; also can be applied to wooden wheels when desired.

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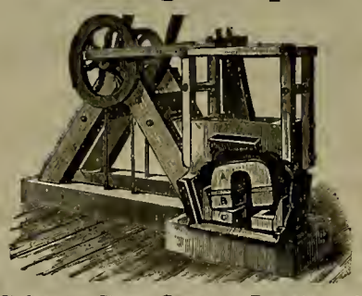

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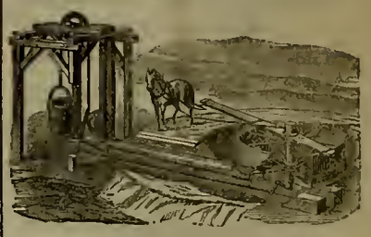

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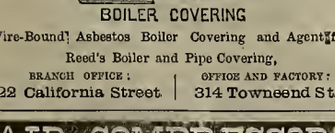

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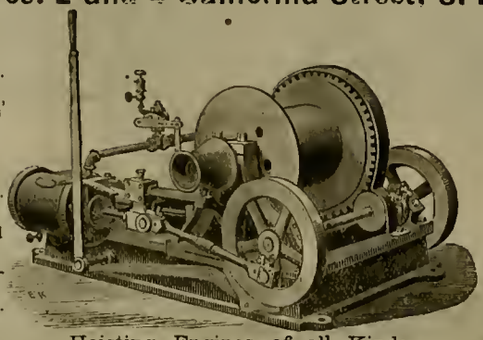

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Hoisting and Pumping Machinery.

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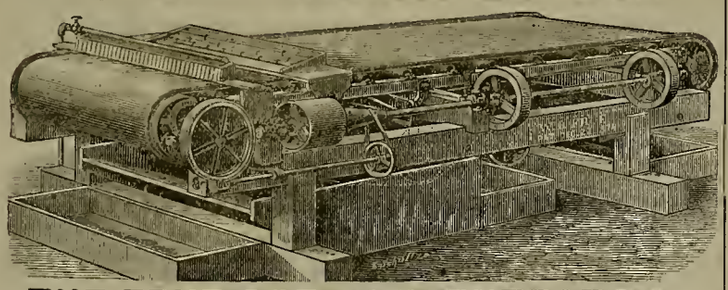

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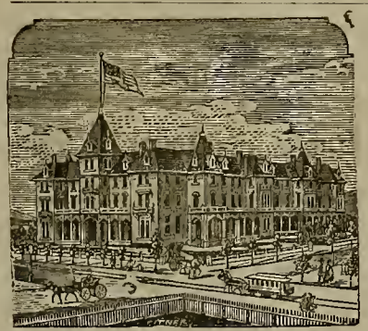

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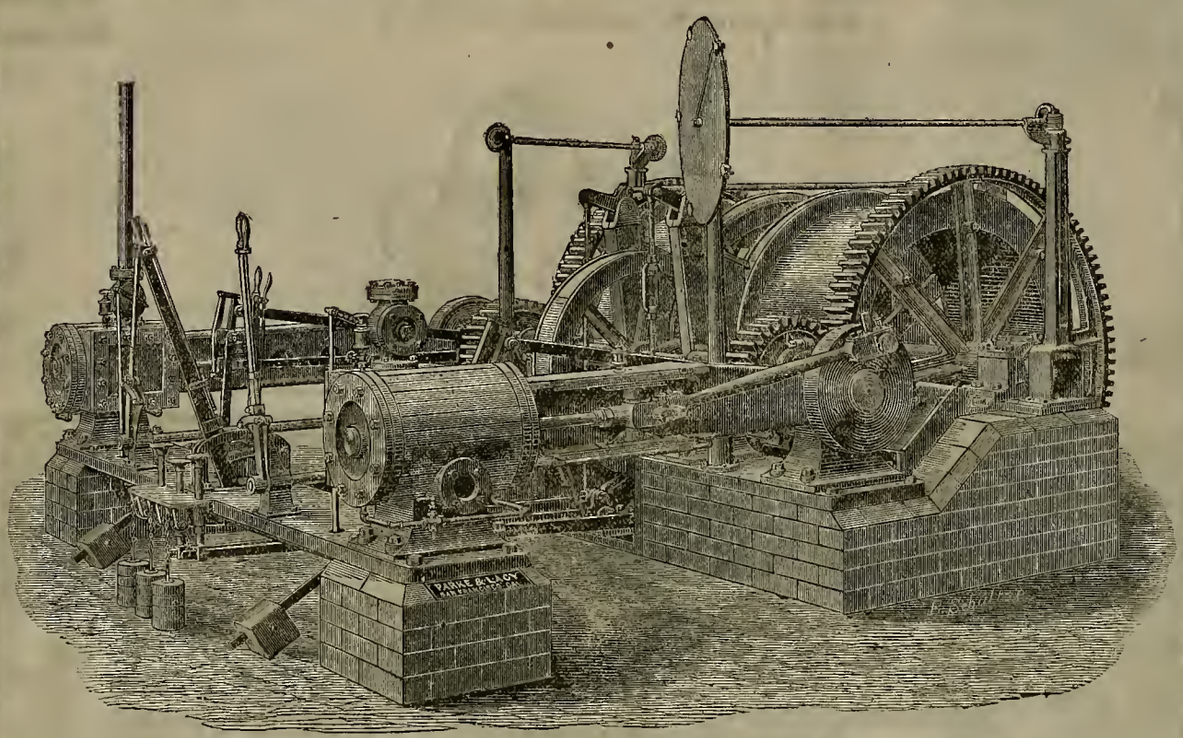

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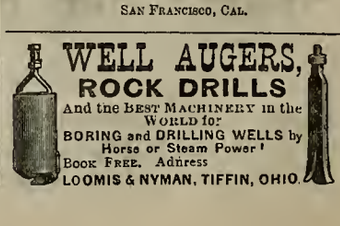

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MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO, SATURDAY, SEPTEMBER 17, 1881.

VOLUME XLIII Number 12

The Panama Canal.

We give on this page a panoramic view of the Panama canal as planned by M. De Lesseps. The general principles of the plan are now so well known as to need no detailed description, and the engraving will give a much better idea than columns of figures would. It shows the course and the relative positions of the rivers. It also shows the location of the big dam which is to turn the Chagres river.

A great deal of preliminary work is now being done at the canal in the way of surveying, boring, etc. They are also studying a way to dispense with a lock at Panama. The high tide at Panama is 32 ft., and on the Atlantic side it is only 1 ft. 6 inches. The problem presented by these differences is now being studied. They think the current will be very small, and that it will present no difficulties to be overcome.

These facts we gain from Mr. Prosper Huerne, an architect of this city, who has just returned from Panama, where he remained several months, superintending the construction of buildings in one of the villages on the line. There will be 15 or 16 of these villages on the line. The first one Mr. Huerne laid out at Gahun, and at the next station to that place. All the material for the building was procured in this city and shipped down there ready to be put together. The mill work, etc., was all done here. Mr. Huerne took about 40 American carpenters with him. Another village station will soon be established. Each village has for buildings, a large shed, store houses, lodging houses, an engineers' cottage, hospital, workmen's kitchen, dining rooms, foreman's lodgings, bakery, water tank, ice house, etc. The villages are arranged precisely alike. Every possible means has been provided to keep the men in good health. The buildings are well ventilated, and all the sanitary requirements are well cared for. The design of the buildings and the general plans were by Mr. Huerne, and were adopted without any demur. Water is brought to all the dwelling houses and they are all properly sewered.

In the panoramic view, Figs. 1, 2, 3, 4, 5 and 6 show stations in the canal where vessels turn out to let others pass. Fig. 7 is the dam for controlling the waters of the upper Chagres; length, 1,500 meters; breadth, 960 meters; hight, 45 meters. Figs. 8, 9, 10 and 11 are valleys inundated by the rivers Chagres, Chilibre, Pequeni, Gatuncillo, hight of the inundation, 38 meters; volume of the water, 1 milliard cubic meters. Fig. 12, lower Chagres, separated from the upper by the levees of the canal. Fig. 13, discharging ditch formed by the bottom of the levees. Fig. 14, cut of the Calebra, hight, 87 meters; length of the canal, 74 kilometers, 49 being in plains, 28 in the rocks; breadth, bottom, 22 inches in plains, 24 meters in rocks; water level, 50 meters in plains, 28 in rocks; depth, 8 meters, 50 in plains, 9 meters in the rocks; shortening of distances by the canal from 1,400 leagues to 4,800 leagues.

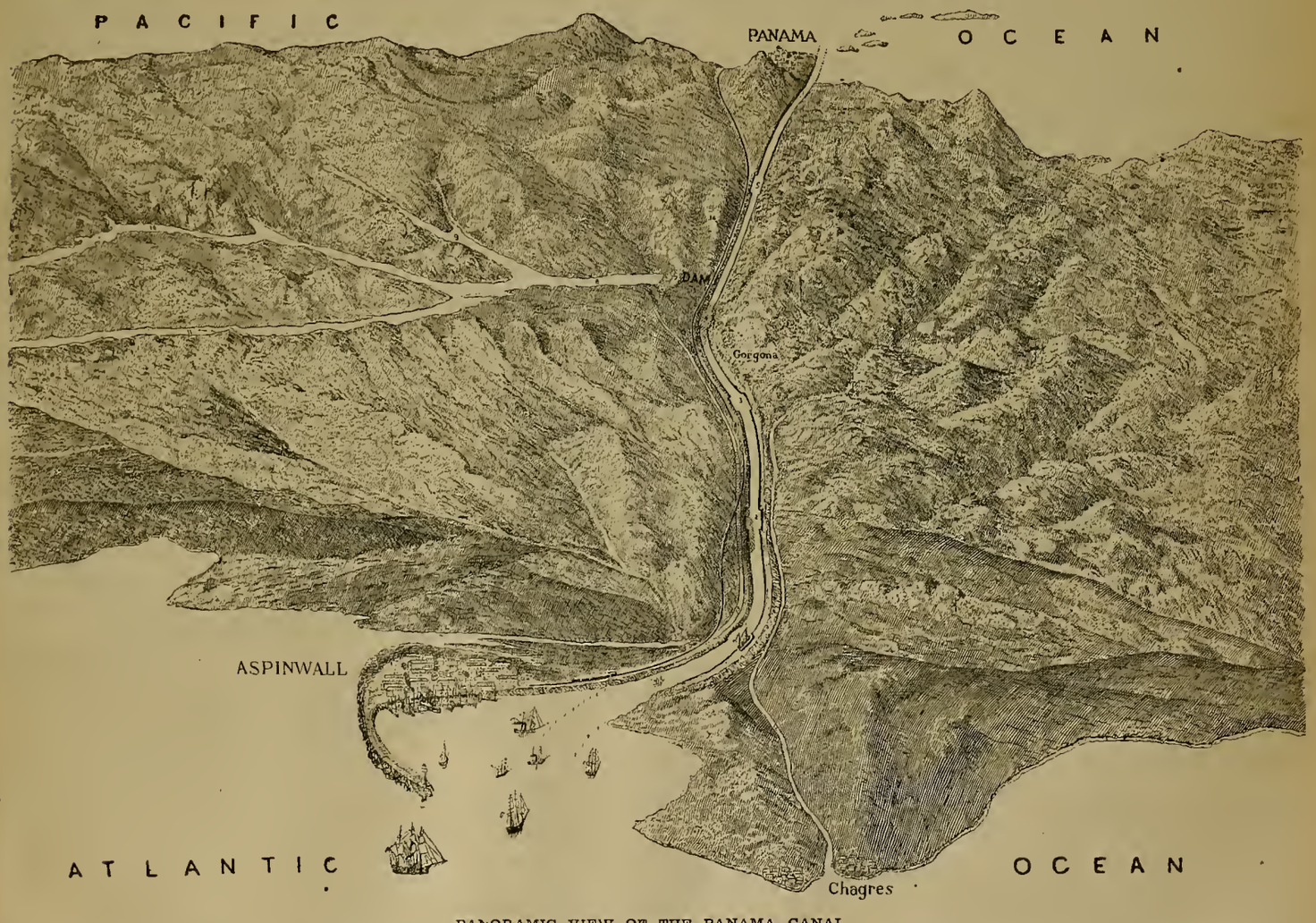
The survey and staking of the line of canal has been accomplished by two corps, which has employed a large number of natives. The check surveys and leveling of the railroad have been finished from Colon to a point beyond Pedro-Miguel on the Pacific side. The bench marks of the leveling have been engraved on the abutments of the railroad bridges, and also on the mile-stones at the necessary points.

The leveling of the longitudinal section of the large canal and likewise the cross sections already laid out, have been connected with the line of the railroad which serves as a base, the level of which commences at the ocean, and which was determined by the first observations made by the hydrographic corps.

The staking out of the work in the mountain regions is nearly completed. There still remains, however, a small amount of leveling of ditches between Obispo and the Chagres river and the crossing of the neighboring summits, the timber from which has been cut down in order to facilitate triangulation. Two corps are at work on the survey of the dam for the reservoir at the head of the upper Chagres.

A corps has been organized to run a line across the mountains by way of Upper Obispo and the river Pedro-Miguel, although the reconnoissance made of this district last year seemed to show that this passage was not as favorable as that by Calebra. The engineers consider that it is necessary to verify this by correct level in order that no possible economy may be overlooked in the definite staking of the canal. Another line is run from the mouth of the canal near Panama to an embouchure on the Rio Grande.

Instruments will be placed on the Chagres at Gamboa for the purpose of observing the velocity of the current and the rise and fall. Similar observations will be made on the Gatuncillo and the Obispo, affluents of the Chagres and on the Rio Grande. At Colon surveys are being continued in order to determine the mouth of the canal, and also works for the protection of the harbor.



PANORAMIC VIEW OF THE PANAMA CANAL.

About 1,500 soundings have been taken in the immediate neighborhood of the line of projected mouth of the canal. Samples of the bottom are taken with each sounding, with a view of determining its hardness. The bottom of Colon bay is covered with mud, which is in certain places mixed with sand; and near the shore, pure sand is found, mixed with small shells. The rest of the bay is bordered with a belt of coral. The softest mud is at the mouth of the Folkes river. This deposit was originated by the stoppage of the current around the island, owing to the construction of the railroad embankment. It can be dredged out, however, if it is decided to make there a harbor of refuge for deep-water ships and coasters.

The temperature varies in Colon between a maximum of 30° C. and a minimum of 21° 9′ C.

(CONTINUED ON PAGE 196.)

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

The Mining Interest in New York.

[From Our Regular Correspondent.]

The group of mines known as the State Line, Nos. 1, 2, 3 and 4, ars attracting much attention here. The transactions in thsse shares are large, and the management seems to havs prices well in hand. Con. Virginia has lately become a favorite stock for speculation in ths New York boards, several thonsand shares changing hands each day, and almost always a larger amount than is sold in San Francisco in corresponding sessions.

New Incorporatione.

Articles of incorporation have heen filed in the County Clerk's office, New York, for the establisbment of the followingnamed companies: The Bright Star Gold Mining Co., capital stock $2,000,000, divided into 200,000 shares of $10 each. The trustees are D. W. C. Morgan and four others. The Hamilton Mining Co., of Nevada; the capital stock is $2,500,000, divided into 250,000 shares of $10 each, and the trustees are L. E. Granger and 18 others. The Silver Belt Mining Co., of Nevada, same amount of capital etock, and similarly divided into shares, with the same named trustees.

Miecellaneous Mining Iteme.

From various local sourcee I glean the following items of intercst about the mines:

The Ontario (Utah) mine produced, during the first fortnight of August, $89,609, assay value.

The Custer (Yankee Fork, Idaho) mine yielded in tbe first 11 days of the month, $5,264 gold, and 30,883 ozs. silver.

From the Leadville mines signs of improvement are given. The Chrysolite mine shipped 83 tons of ore August 19th. Work is being resnmed in the stopes near the old Vulture claim, where the fire has done no damage.

Some very wildly flattering newe comes from the Robinson Con. mine, which has been under litigation for some time, but has finally escaped from the courts. General Manager Ewing writes: "For the week ending August 14th, inst., there were mined and ehipped to smelters 442 tone of eplendid ore, and for two weeks to that date, 908 tons. Everything in tbe mine is looking splendidly. The strike of ore jnst made in level No. 7 is immense, and assays average $125 per ton." All of which must be very comforting to etockholders who have just had to stand the payment of a large sum in compromise of title.

The Non-Aeeessable System.

The New York "promotors" have always lauded to the skies the advantages of incorporatiug mines under the New York State law, and indeed there are many good points about it. The main argument in favor of making the etock of corporations full-paid or unassessable is that it protects shareholders against unnecessary levies, or assessments called in simply for the purpose of depressing the stock for the profit of the manipulators. But sometimes the system breaks down. For instance, suppose a mine, a good one, to be controlled by a stock incorporation. In placing the etock on the market estimatss have of course to be made of the amount of money uecessary to make any required improvements; as, for example, bnilding a mill or road, or for paying for labor and supplies until returns can be had from bnllion. With etock companiee a certain amount of ready cash is indispensable. Now, suppose the amount to have bsen underestimated, and when the improvements are completed, or nearly eo, the mine to have run in debt beyond its ability to pay in cash. It is obviously a simple matter for some one to advance, for a short time, the needed fnnds, or to pass around the hat for a voluntary subscription. But sometimes it is found impossible to raise even comparatively small amounts in this way. Shareholdere have been disappointed, if not deceived, and feel unwilling, as they say here, to "send good money after bad." The result is a collapse, even in cases where, by the nse of only a little more money, the mine might have been placed on a paying footing.

Of course, if the mine were not a good one it would be much better to have it ehnt down at once, rather than drag out an artificially-prolonged and miserable existence, finally to die a lingering death, painful alike to etockholders, management and creditors. But I am speaking of properties which might or ought to be paying investments.

In the course of my travels through the mining districts last year, I came across several instancee of the kind. One was a peculiarly hard one. A fine 20-stamp mill had becn put up and other expensive improvements had been made. I think the company had expended about $150,000 in all. They had met their bille promptly and established a good reputation for solidity, when snddenly, owing to a miscalculation of expense, the fnnds gave out. A comparatively emall indebtednsss was incurred, but such was the distrust of the non-assessable system that teamsters refused to hanl ore from the mine to the mill, and miners to work longer on ehort credit. There seemed no reasonable doubt but that with a little more money on hand, the company would have pulled through and mads fair profits. But the sharsholders and management as well wers discouraged. No one was ready to stand in the breach, and consequently ths mins was closed down. Here wers $150,000 practically lost, as it would be hard to sell a propsrty so circumstanced, mersly for the want of $10,000 or $15,000 more to make good the dsficit. The company is therefore practically bankrupt today.

Ths system has also the disadvantages of weakening the credit of companies opsrating under it. In Nevada, even tbough a hig San Francisco company may be losing money hand over hand, the miners and purveyors of supplies feel reasonably confidsnt that thsy will get thsir pay from assssment monsy, if not ont of the mine itssl. But in the case of non-assessable mines, paymsnt depends upon the mere chance that somebody may step up and sattle.

On the whole, I think the New York system the best for stockholders. It may have the effect of causing mines, which might bs mads to pay, to bs abandoned or lie idle for long psriods; hut it certainly in the long run saves money. If New York or Boston men had controlled the Comstock from the bsginning, they would undoubtedly have given up long before the Crown Point bonanza was etruck, to eay nothing of the later "big bonanza." But on the other hand, if they would have lost in this case, they might have saved in other directions enough to counter-balance the loss. Erring through timidity may be no worse than going too far through recklessness. And certainly New Yorkere never would have kept up the crowd of assessment claime which are doing so much to deplete the country.

But after all, there is no denying the fact that Eastern managements are anything but popular in the mining regions. How often, after an experience like the one quoted, have I heard miners, mill-hands, shop-keepers, and teamsters alike, all praying earneetly and with one accord for a California company to take hold—"then things would be lively," they say.

PAUL WARD.

New York, August 28, 1881.

Georgetown, New Mexico.

A correspondent of the *Herald and Southwest* says: Our camp looks better to-day, and it ie yielding more ore, than at any time in the past. In the "Naiad Queen" there is ore visible in considerable quantitiee in every drift, and in some of them, in very large quantities. They have already hoisted 75 tons this week, and by Saturday they will have reacbed 100 tone of very fine ore, which will no doubt average 100 ozs., or more per ton. The upper mill—10 stamps—produced last week 15,000 ozs. of fine silver, and will probably equal this amount per week for some time to come, as they are now running on high grade ore. Heretofore they have been rnnning a great portion of the time on low grade ore, assorted from the dumps. They work in this mill 20 tons per day, and 4 or 5 tons in their lower mill of 5 stampe capacity. The latter they nse for working custom ore. Both of their mille are in the charge of Mr. John Spiller, a gentleman of large experience in the business of reducing ores. He not only givee entire eatisfaction to the company, but to all who take ore to him for redncticn. This fact epeake volumee for him, as mill men are generally looked upon with enspicion, by those for whom they attempt to reduce ore, at least. The extension of the "Satisfaction," also owned by the Mimbres mining company, is improving greatly in appearance and is turning out several tons of rich ore daily. These two mines will keep their mills running continuonsly and if the output continues to increase in the future as rapidly as it has for the last two or three months, they will soon need a 40-stamp mill to reduce their ores instead of the 15-stamp used at present. The company has recently ordered an engine of considerable power, which will replace the one now used on the "Naiad Qneen" for hoisting purposes, and which will be used for the same purpose on the extension of the "Satiefaction," which will greatly facilitate work on both mines. Thie company owns other mining property in this camp, but is not doing much work on any of their other mines at present.

The "McGregor" mine has been yielding ore in very considerable qnantity of late. They have now at the mill and on their dnmp upwarde of a hundred tons of ore that will graze 200 ozs. per ton, and which will give the lucky owners of this mine a handsome sum. The "McGregor" has been a paying institution from the day of its discovery, with the exception of a short period, when a large amount of deadwork had to be done to place it in proper working order, and no mine in thie rich camp yields a finer grade of ore.

The "Commercial" mine, lying contiguous to and between the "McGregor" and tbe "Naiad Queen," is also yielding good ore, and in paying quantity. This mine, like the others above named, has never failed to pay its owners well, and from all appearances will continue to do so for yeare to come. The "Satisfaction" property, owned by Stevens, Holt & Walters, of this place, is now bonded for $40,000.

THE *Southern Utah Times* makes the prediction that the time is not far distant when the mining of copper will take rank among the chief industries of Utah.

Steam in Land Reclamation.

It was only last July that Mr. Gladstone, in the Houss of Commons, in courss of the discussion upon an amendmsnt to empower the Land Commission to purchase wasts lands in Ireland, said that of all enterprises connected with agricultural improvements, "there was none so difficult, slippery and hazardous as the reclamation of land." No doubt be had in his mind the reclamation of the Duke of Sntherland, who reclaimed 2,000 acres at a cost of about $500,000, or $250 per acre. But then the Duke of Sutherland was new in the bnsiness, and in his later creations has used steam cultivators, of which it is written:

We believe no intelligent person could witness the striking sight of Messrs. Fowlers' powerful steam plow holding its way steadily along the roughest surfaces it has to encounter, cutting a duplicate furrow (surface and subsoil) of the depth of two and half ft. at same operation, without fear of either breaking or sticking fast on the most stubborn rock-head; or the patent "disc-er" following and tearing ths toughest "divot" into a fine mold, without admitting that the Sutherlandshire experience has accomplished a marvelous success in the adaptation of steam power to the reclamation of waste land.

How much tbie later land will cost the Duke, we do not know, but local authorities believe it will be profitably secured, and that there will be an exception to Mr. Gladetone's dictum on his own soil.

There are many who will grant the truth of Mr. Gladstone'e remark as applied to California reclamations, when they remember the money they have lost in insufficient leveeing on the tnle lands. There are othere who are still at work in the full belief that a good levee will settle the problem, who will admit that Mr. Gladstone's adjective "slippery" taken in its literal sense is true of the work they have in hand. For in the Duke of Sutherland's venture he had to deal with "heath-land moor and hilleide," while our reclaimers work in the mud which they have to take up in giant spoonfuls from the river bottom and deposit on their levees.

This leads us to remark the intsresting and effective machinery which has been devised to meet the needs of California capitalists and resident representatives of foreign capital and which are just now a prominent feature of our mechanical engineering. There is the immense dredger built by Gen. Williams and now at work on his tule estates. So far has its fame gone abroad that DeLesseps has sent for photographs of it to aid in the construction of his Panama canal machinery. There is another dredger which was built in Stockton, and planned by John W. Ferris, Supt. of the Glasgow Co.'e entsrprise on Roberte island. The Stockton *Independent* givee an interesting decription of this machine and ite work.

Briefly, the machine is, first, a boat or scow, on which the machinery is monnted. Through the center of the scow is a well, in which works a "spud" or pile, which sinks in the mud and holds the boat in place whils the dirt is being excavated. The boat can swing around on this pivot, if need be, cutting a swath all around it, and it must cut a width of 42 ft. to clear a road way for the boat. It can cut 12 ft. from water line down; but, where at work, it is unnecessary. It is now working in an old canal between the levee and the river, made by former land excavations in building the leves. This canal, when filled at high tide, wss locked at each end, thus holding the boat at one tide level while the work is being performed. It could start from the river inwards, cutting its own road across tbe island to the opposite shore. In fair work, with four men, one on the hank or levee to prepare it for the harrows, this engine can excavats and place in position 500 cubic yards of earth in one day of 10 working hours. The buckets, which run on an endless chain, hold three cubic ft. each, not counting the overplus, or lip room of the buckets, which go far to make up any deficiency in partially filling those which happen to take a light cut. The engine, 10x20 cylinder, works easily on 700 pounds of Wellington coal per day, raising this material 20 ft. above the deck, where it is discharged into a hopper, theuce to the conveyer which deposits it on the levee. Tbe bottoms of ths buckets are open to permit ths escape of the water, for the dryer tbe earth can bs placed on the levee, the better the work is when finisbed. The buckets ars four ft. from center to center and speeded at an advancs of 75 ft. per minute. The conveyer is on the elevator principle. It baś an extension of 75 ft. It is composed of an endless chain on each side—canvas lining—traversed with hard wood slats, two ft. apart, to which are attached iron rollers which run on railroad tracks above and below. From the hopper to the levee, the slope of the conveyer is enough that tne weight of the material carried materially assists the force necessary to move it to sbore. The capacity of this machine for mud dredging, if careless where and how it was deposited after lifting, would be 1,000 to 1,200 cubic yards per day.

We find in the *Independent's* account of the work of the Glasgow company, a record of some teste with different kinds of scrapers which will he of value to levee builders and ditch makers everywhere, hence we quote as follows:

Three kinds have been tried, and submitted to actual working tests, the results of their work being carefully measured. They were the four-horse scraper, made in Stockton by Lisenden, commonly called the Southern Pacific scraper; McGuire's old-fashioned scoop-shaped, and the Chicago scraper, each two horses. At this test, the basis of measurement of the holdinc or carrying capacitics of the scrapers was arrived at hy taking a given number of loads hauled in, indiscriminately, and measured. It was found that the McGuire scraper had a capacity of 4½, the Chicago scraper 8, and the Southern Pacific four-horse scraper 13½ cubic ft. Mr. Ferris kindly furnishes the following figures and estimates of scraper work, as tested by him on these works. The time occupied by a scraper making an average round, hauling dirt, say 65 ft., equals 1¾ minutes.

The cost of a scraper team is as follows:

Wages of driver	$1.00
Board of driver	50
Two horses' hire	75
Two horses' feed	50
Superintsndence	25
Cost of two-horse team	$3.00
Extra for additional pair of horses	1.25
Total cost of four-horss team	$4.25

Taking, therefore, the capacities of the several scrapers as above, the McGuire scraper should take in 58½ cubic yards per day, of 10 hours; the Chicago scraper, 100½; the Southern Pacific four-horse scraper, 170. Allow a discount of 50% for delays of different kinds and capacities of ths various scrapers, and the cost of work done by them may safely be taken as follows: McGuire scraper, 28 cubic yards per day, at cost of $3.00, equals 10¾ cents per yard; the Chicago scraper, 50 cubic yards per day, at a cost of $3.00, equals 6 cents per yard; the Southern Pacific four-horse scraper, 85 cubic yards per day, at a cost of $4.25 per day, equals 5 cents per yard.

A test of 851 ft. of levce was devoted to a trial of the Southern Pacific four-horse scrapers—ths conditions were favorahle, that is to say, the matcrial was free from weeds and lumps and the hight of fill was not over about 4½ ft. They completed 5,937 yards in 62½ days'work, or 95 cubic yards of earth moved per scraper per day, at a cost of $4.25, or 4½ cents per cubic yard.

Land reclamation is one of the most interesting of our agricnltural operations, and ws shall always be glad to hear from our readers the methods and results of any operations they may havs carried out.

A Fine Field for Mining Enterprises.

Now that it has been decidsd to run a tunnsl on the west side of Wolf Creek, to drain the propsrties purchased by the Menlo Mining Company, of New York, which will ultimately bs extended for the benefit of other important mining claims, interest is natually excited in anothsr projsct which has long bean in the minds of many miners in this district, and that ie the driving of a tunnel from the east side of Wolf Creek into Osborn Hill, the high range less than a mile distant, which is traversed from end to end with gold-bearing quartz leads, and from the earliest discovery of quartz in the district has been one of the favorite fields for mining and prospecting. This range is several miles in length, and is completely ribbed with qnartz veins from its western to its eastern base, there being in all at least sixteen parallel veins, having a strike from north to eouth, and nearly all a western dip. As early as 1851 claims were located on Osborn Hill, and the mine of that name producsd largely up to the year 1857, and with euccess for years later. The Whecl Betsy was another claim that produced for a long time ore that averaged $40 per ton. The Houston Hill mine which is at the northern end of the range, wae a valuable mine at one time, and from 1864 to 1867, something less than three years, produced $500,000. There were other producing mines on the range at that time, and in later years there was the Ione, Ben Franklin, Sebastopol, Redan, Alaska, and others that will be remembsred by many readers, and at the preeent time there are the Centsnnial and Prescott Hill that are being worked regularly. A tunnel from Wolf Creek into the center of Osborn Hill would strike the range nearly 1,000 ft. below the surfacc, and then with lateral drifts would give drainage that would open up a vast extent of valuable mining ground. The veins of that section are not widc, as a rule, but the ore is generally a high grade, as was originally the case with the Osborn and Houston Hill minee, and is now ehown by the Centennial ores, which go from $60 to $100 per load. The possibilities of rich mining development by a tunnel such as suggested are very great, and since it has been shown, in the case of the Menlo tunnel soon to be started, that outside capital is willing to seek investment here, it is worth the while of those companies located on Osborn Hill to make a big effort to induce a similar venture of money in that direction. It is certain to be done some day; in fact it shonld have been undertaken long ago; and now is an opportune time for men of business and mining sagacity to begin to move in the matter.—*Grass Valley Union.*

SPECIMEN STEALING AT THE IDAHO MINE.—A discovery was made at the Idaho mine on Snnday morning which resulted in the summary dismissal of five miners, in whose dinner buckets quartz specimene were found. The underground work in the mine is discontinued at 12 o'clock midnight on Saturdays, but the shaftmen, of which these five men were part of the force, work until Sunday morning. The shift was composed of eix men, who were in the habit of taking their dinner buckets down in the mine with them, and as they came to the surface on Sunday five of the buckete contained specimens. As there were no other miners underground from midnight to daylight, the opportunity for looking for specimens was good if the men were dishonest enough to take advantage of the situation, which it seems five of them were. The Messre. Coleman are said to have made the discovery, being on hand when the men came off shift. Whether they had cause for suspicion is not known, as little dircct information can be obtained in regard to the matter.—*Nevada Transcript.*

ARIZONA MINES AND CHINESE CAPITAL.—From a letter in the Arizona *Journal* we take the following paragraph: As capital is the backbone of a mining camp the prospects of Dos Cabezas have been brightening up lately under the influence of heavy investments made by the Commonwealth Consolidated Mining Company of Arizona, a syndicate of moneyed men residing principally in Shanghai, China. They have purchased sixteen mines in and about this camp and have bonded some half a dozen more. On the most of these considerable prospecting has been done, and already the showing is sufficient for my saying that Dos Cabezas will be a bullion producer before months roll over our heads.

IT ie reported that a number of Philadelphia capitalists have purchased the Nuestra Senora, an old and valuable Mexican property, situated at Sinaloa, Mex., embracing over 8,000 acres of mineral, timber and agricultural lands.

MECHANICAL PROGRESS.

New Sheets in Old Boilers.

It becomes necessary sometimes—particularly in common cylinder boilers—to renew the fire sheets, or those directly exposed to the action of the fire. At points over the bridge wall for example, particularly if the latter is too closely set, rapid deterioration ensues and renewals are required when the rest of the boiler is comparatively new. Sometimes after such renewals accidents occur; the boilers give out, and always leak to a greater or less extent in other parts of the structure.

We apprehend that this is due to purely natural causes, or we may say mechanical defects, which in the present article we do not propose any remedy for. We do not know of any; that is a point for consideration. We think it will be conceded that a steam boiler that has been used for a length of time, say six months, has acquired a condition of what may be called natural tensions. That is the several sheets by alternate heating and cooling and through the working pressure have settled to something like a uniform state of resistance, so that, as far as possible, they are uniform throughout. Suppose, now, that we cut out a sheet or two, what have we done? We have destroyed the tensions that existed, and instituted new ones in place of them. The inserted sheets are fitted to their places, marked off, and punched or drilled, but there is no way of making them of the same stiffness or tension as those cut out, except by making a little draft on the holes and drawing them up by a drift pin. The new sheets are slack sheets, and almost invariably leak for the first few weeks after their application.

A better and safer, though more expensive plan would be to renew the whole section of shell all around the boiler where it is weak, than to put in two or more sheets directly over the bridge-wall, or furnace, as is now done. If it is a return-tubular boiler that is to be repaired, the tube sheets need not be disturbed, as only the rivets in the heads would have to be cut. If this method was practiced, something like a balance would be restored, though the new part would be stiffer than the old. Each section, of course in the shell, however, would bear its own proportion of strain. This is not the case now, as we have pointed out.—*Mechanical Engineer.*

Modern Mechanical Progress Due to the Many.

We get our ideas of progress in any direction by comparison. We are ahead to-day, because we were behind yesterday. Viewed in this light, it is not necessary for the middle-aged craftsman to go back beyond the commencement of his own mechanical experience to see the marvelous nature of this progress. We need go back but little further to note a progress that has in itself, practically, all there is of to-day's mechanical standing. A writer on this subject has remarked, that only a few years ago the vapors from water arose and passed away unnoticed. To-day the knowledge of how to apply that vapor to useful purposes stands out pre-eminent as a great land-mark of our civilization.

It would be as idle to demonstrate what this knowledge and its application are doing for us, as to determine what material progress it is not an important factor in. Knowing as we do to-day, something of the potency of the agent, we are prepared to accord to its influence, perhaps, all that belongs to it. It ceases to be a wonder to us that we cross the Atlantic in a few days, not entirely nor mainly because it is common to do so, but because we have become educated up to a limited understanding of the agent we employ.

We cease to marvel that the distance between New York and San Francisco is reduced to a few hours, because we know something of the means by which the distance is annihilated. We may wonder that all these material agencies existed unused and unappreciated for thousands of years. Coal, and water, and iron were at hand 200 years ago, just as they are at hand to-day, and yet our immediate ancestors went on foot weary distances—measured by days—which we compass in a few minutes. We may wonder that they imperfectly clothed themselves from the products of the hand loom, while the equal of our most common products of machinery turned by steam, were, in their luxury, unknown to them. This wonder amounts to nothing except that, in itself, it is a tribute to the remarkable mental progress made within the past generation; to the conquest of matter by mind. It is no marvel that man, in daily contact with all these things, brought to witness accidental exhibitions of agencies that could hardly be called hidden, should conceive the possibility of applying, or should even rudely apply, some of them to useful purposes; but it is little less than miraculous that in so short a time the application should have advanced so far toward perfection.

This, in turn, leads to the consideration of why it is so. Scarce a generation has passed since the locomotive engine was, so to speak, in embryo, and yet to-day it is almost perfect as an example of engineering. This is due, not, as is sometimes asserted to one or two individuals. It is not to be accounted for by the superior attainments of half a dozen. It is due to the universal advancement of the many. The rude but priceless locomotive of half a century ago was the production of the few. The artistically complete production of to-day is the gift of the many. Just so it is with other great mechanical achievements. It is one thing, usually a simple thing, to conceive of perfection. It is another thing, usually a difficult one, to devise ways and means by which to approach perfection.

A short time since, comparatively, the boring of a cylinder for a steam engine with any degree of regularity was impossible. To-day the attainment of reasonable perfection in the process is one of the rough jobs of the shop. And so with all other processes.

Take the advancement in machine processes, which render possible the refinement of any particular product, and you find no individual standing pre-eminent. It would be extremely difficult to place the credit for any modern machine tool where it belongs. In fact, it can only be done by accounting for the universal increase of knowledge. Into these tools, and into these processes, and into all our great products, the individual workman puts the efforts of his brain. It is necessary to mix knowledge with matter in the production of mechanical refinements. Matter has always been at hand. Knowledge has been wanting. It has not been common. It has been confined to the few. The reason for our rapid mechanical advance is that this condition has become materially changed.

For obvious reasons the burden of mechanical advance must be made by the mechanic. Fifty years ago he was disqualified for this by ignorance, and mainly from lack of opportunities. To-day, he is qualified by intelligence and by education. Thanks to technical journals and books, the man in overalls is, or may be, better educated—mechanically—to-day, than the man in broadcloth of 50 years ago. In the future, as in the past, it is from the efforts and education of the many, rather than the few, that mechanical progress is to come.—*American Machinist.*

The Mechanic's Capital.

The mechanic is sometimes looked upon as a man without capital. Sometimes he looks upon himself in this light. This is all a mistake. The man who earns $1,000 a year has not only capital, but, in these times of low interest, he has considerable capital.

The manufacturer and the merchant aim to increase their capital by a judicious handling of present means. The mechanic does, or should try, to increase his in the same way. Knowledge to the mechanic is capital, because it enables him to command more for his services. If he possesses simply the skill of the workman, he can make that skill earn him a certain sum per year, which sum is the exponent of the capital he has invested in his business. If, to the skill of the workman, he adds the knowledge of the man who thinks beyond present purposes, he earns more, or in other words, increases his capital. The young machinist, for instance, who learns machine drawing, is morally certain at some time to find use for it where it will stand exactly to him as the money of the capitalist stands to its possessor; although this is hardly a fair statement, because he will at once find use for it. When the man who earned $1,000 a year by virtue of his skill as a workman, adds such a knowledge of his business as to earn $2,000, he has as surely doubled his capital as the man who has twice as much money to invest in his business as he formerly had.

It is earnestly advised that every apprentice to the machine business shall do a little calculation for himself on this subject, always remembering that capital which is the result of skill and knowledge is seldom at a discount, and never lost. It is just at this time in their lives, when habits are formed, that to a great extent determine the working capital with which they are to go through life.—*American Machinist.*

NEW USES FOR GLASS.—It is stated that Mr. Frederick Siemens contemplates adapting his toughened glass to street gas lamps, substituting glass for the iron pillars, and for water main pipes. These articles, it is claimed, are much stronger than iron castings, and imperishable and incorrodible. It is said that common castings, which are now procurable at prices which do not return the iron founder more than the barest profit, or none at all, can be produced in Siemens' glass at about twice the figure, giving ample profit to the manufacturer. As the specific gravity of glass is only about one-third that of cast iron, the purchaser will be able to obtain glass articles at about 33% cheaper than similar goods in cast iron, as he will get, say, three pipes for the weight of one cast-iron piece of main.

GIVE US A FEW PANS.—The Yreka *Journal*, of Aug. 24th, says that "the Kanaka company on the Klamath river, cleaned up 160 ozs. for six days' work last week, with 12 men working on each shift, or 24 men for day and night, each shift working for 12 hours. This claim seems to be on a level bench of bedrock, and pays very regular, with some exceedingly rich spots. Several persons visiting the claim have been told to pan out a prospect to keep, and the poorest panning has been $10."

SCIENTIFIC PROGRESS.

Continental and Island Life.

Just as political geography sometimes presents boundaries not in accordance with the physical structure of countries, so the distribution of animals and plants shows many peculiar and unexpected features. Hence naturalists have divided the continents into what Sclater has called zoological regions, which are, so to speak, the great empires of animal life, divisible often by less prominent boundaries into provinces. In vegetable life similar boundaries may be drawn, more or less coincident with the zoological divisions.

Zoologically, North America and Greenland may be regarded as one great region, the Nearctic, or new Arctic (the prefix not indicating that the animals are newer than those of the old world, which is by no means the case). South America constitutes another region, the Neotropical. If now we turn to the greater Eurasian continent, with its two prolongations to the south, in Africa and Australia, we shall find the whole northern portion, from the Atlantic to the Pacific, constituting one vast region of animal life, the Palearctic, which also includes Iceland and a strip across North Africa. Africa itself, with Madagascar, whose allegiance is, however, only partial, constitutes the Ethiopian region. India, Burmah, the south of China, and certain Asiatic islands form the Oriental region. Australia, New Guinea, and the Polynesian islands constitute the Australian region.

All of these regions may, in a geological point of view, be considered as portions of old and permanent continental masses, which, though with movements of elevation and depression, have continued to exist for vast periods. Some of them, however, seem to have enjoyed greater immunity from causes of change than others, and present accordingly animals and plants having an antique aspect, geologically speaking, in comparison with the others. In this sense the Australian province may be regarded as the oldest of all in the features of its animal forms, since creatures exist there of genera and families which have very long ago become extinct everywhere else.

Next to this in age should rank the Neotropical or South American region, which like Australia presents many low and archaic forms of animal life. The Ethiopian region stands next to it in this, the Oriental and Nearctic next, and the last and most modern in its aspect is the great Palearctic region, to which man himself belongs, and the animals and plants of which vindicate their claims to youth by that aggressive and colonizing character already referred to, and which has enabled them to spread themselves widely over the other regions, even independently of the influence of man.

On the other hand, the animals and plants of the Australian and South American regions show no such colonizing tendency, and can scarcely maintain themselves against those of other regions when introduced among them. Thus we have at once in these continental regions a great and suggestive example of the connection of geographical and geological distribution, the details of which are of the deepest interest, and have not yet been fully worked out. One great principle is, however, sufficiently established; namely, that the northern regions have been the birthplace of new forms of land life, whence they have extended themselves to the south, while the comparative isolation and equable climate of the South American and Australian regions have enabled them to shelter and retain the old and moribund tribes.—*Princeton Review.*

What Causes the Blood to Circulate?

To what degree the heart is aided by other forces is yet a matter of investigation. Probably there are, several forces assisting. The elasticity of the arteries increases their carrying capacity. They are firm, elastic tubes, which expand under the pressure from each heart-contraction, and then by their own elasticity contract and help the onward flow of the blood. In the smaller arteries the flow loses the intermittent character it possesses in the larger arteries, and becomes a steady stream. The elasticity of the arteries serves precisely the same purpose as the air chamber of any force-pump, that of equalizing the flow, and so increasing the amount delivered. The whole force is derived from the heart; the arteries cause the force to act continuously.

The veins are lax tubes, somewhat larger than the arteries, and capable of holding all the blood of the body. They convey the same amount of blood as the latter, but more slowly. In the larger veins, however, near the auricles, the velocity may be 200 millimetres per second. They are provided with valves which effectually prevent the blood from flowing backward toward the heart. Any compression, produced by muscular contraction, or otherwise, will therefore assist the forward flow of venous blood. This is one explanation why exercise hastens the circulation. The movement of the chest in breathing probably aids the pulmonary circulation, the blood, as well as the atmosphere, tending to fill the vacuum during inspiration.

Physical capillary force is not generally regarded as an active force in the circulation. But there is an admitted force in the capillaries, resulting from the attraction of the tissues for the arterial blood, containing the required oxygen and nutriment. "The vital condition of the tissues becomes a factor in the maintenance of the circulation." It is this force, primarily, which adapts the amount of blood to the varying needs of any organ; the nervous system regulates the supply by varying the caliber of the vessels.

The force in the capillaries, or some other force, carries the blood, after death, from the arteries, where the heart leaves it, into the veins. Finding the arteries empty after death gave rise to the idea that they conveyed only air; whence the name. It was this belief which Harvey overthrow in 1620.—*Popular Science Monthly.*

Ozone as a Cause of the Luminosity of Phosphorus.

Various writers, especially Joubert, have called attention to the connection of the phenomena of phosphorescence with ozone. To learn something of the nature of this connection, Chappuis has studied the effect of ozone upon the luminosity of phosphorus in the presence of oxygen. Fourcroy had long ago observed that in pure oxygen, at a temperature of 15° and under atmospheric pressure, phosphorus is not luminous in the dark. Chappuis now finds that under these conditions a bubble of ozone introduced into the bell jar produces the phosphorescence, though only momentarily, the ozone being destroyed. Moreover, it is not the vaporization of the phosphorus which determines the phosphorescene, but the combustion of this vapor, the entire space occupied by the oxygen at first appearing luminous, the solid becoming so only after all the vapor has been burned by the ozone.

Two cylinders, one containing air, the other pure oxygen, were inverted over two dishes containing iodide of potassium and starch solution. A fragment of phosphorus was plunged into each gas, in contact with the liquid. In the first, the phosphorus became luminous and the solution became blue. In the second neither phenomenon appeared. Whenever the phosphorescence appeared, ozone was present; and whenever ozone was absent there was no luminosity. Moreover, the author calls attention to the fact that certain bodies which have the power of preventing the luminosity of phosphorus are precisely those bodies which destroy ozone or are destroyed by it. Oil of turpentine, for example, which is the most active, destroys ozone completely. In a balloon containing air, phosphorus, and turpentine, a bubble of ozone produces light for a second only, the ozone being destroyed by the turpentine, but burning a part of the phosphorus vapor also. On adding the ozone the luminosity extends throughout the space, and at last the solid phosphorus only remains luminous. Hence the author regards the production of the luminosity of phosphorus in oxygen as one of the most delicate of the reactions for ozone, and purposes to employ it in subsequent researches.—*Bull. Soc. Ch.*

The Extraction of Iodine.

The methods of extraction of iodine and bromine from seaweed have undergone a great transformation during the past few years, but so far the processes generally employed have necessitated the incineration of the seaweed, and consequently its destruction as a manurial agent. In order to extract the iodine without destroying the organic matter, Messieurs Laurot and Collet treat the weed with either hydrochloric, sulphuric, or phosphoric acid, or with the bisulphate of soda or potash.

The weed to be operated on, says *Design and Work*, is placed in a suitable cistern of wood, iron, or cement, lined with lead, and so arranged that it may readily be heated by means of a steam coil or jacket. It is then sprinkled with one of the substances named, in proportions varying with the nature of the mass from 1% to 5%.

At the bottom of the cistern a layer of liquid is formed, and heat is applied to bring the whole to the boiling point. After a short time the contents of the cistern form a kind of broth consisting of a clear liquid and a finely divided pulp, which is easily removed from the liquid by means of a filter press.

The liquid thus obtained represents almost the whole of the moisture, the iodine, and the soluble matter contained in the weeds submitted to the operation.

This liquid is allowed to deposit the solid matters which it may hold in suspension, and it is evaporated down to half its bulk in a closed boiler, the steam which it gives off serving to heat the contents of another cistern.

When it has been brought to this condition the liquid is transferred into appropriate vessels and mixed with perchloride of iron, nitrous sulphuric acid, manganese, or any other reagent capable of setting at liberty the combined iodine. The whole is then made to boil, when the vapor carries away the iodine which is condensed and collected.

The acid liquid remaining behind is mixed with phosphate of lime in sufficient quantity to render the phosphoric acid soluble, and the whole is then dried.

A GOLD COLOR DYE.—It is reported that two professors of chemistry in Zurich have discovered, after much labor, a splendid gold-like color, which can be applied even on fabrics.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 25		Week Ending Sept. 1.		Week Ending Sept. 8.		Week Ending Sept. 15	
Alpha	4.40	4⅜	4	3.55	3⅝	....	4⅜	3.90
Alta	4.15	3.80	4.05	3.90	4.80	4.40	5	4⅜
Andes	1.30	1.15	1.20	1.05	1.60	1.05	2.30	1.70
Albion	1.90	1.55	2	1.70	2.20	1⅞	1.95	1.70
Argenta	....	....	....	....	....	....	....	....
Addenda	30c	25c	35c	20c	30c	15c	20c	15c
Belcher	3.30	3.10	3.05	2.60	3	2.60	3.30	2⅞
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	13⅞	12⅛	13⅞	11⅛	12½	11⅛	16	13
Bullion	1.45	70c	1.20	1.10	1.15	60c	1.30	1
Bechtel	1.15	1.05	1.30	1	1.05	80c	1	95c
Bel Isle	20c	....	20c	....	25c	....	15c	....
Bodie	9⅝	8⅝	9⅞	9	9⅞	9¼	9	8⅛
Benton	1	85c	95c	90c	95c	85c	1.05	95c
Bulwer	....	....	2½	2.40	....	....	2½	2¼
Boston	....	....	....	....	20c	10c	....	....
Black Hawk	25c	20c	25c	20c	15c	....	20c	15c
Belvidere	50c	....	....	....	....	....	....	....
Booker	....	....	....	....	5c	....	....	....
Caledonia	45c	40c	35c	30c	30c	25c	45c	30c
California	1.10	1	1.05	1	95c	90c	1.10	90c
Challenge	95c	90c	80c	....	80c	....	95c	65c
Chollar	3.05	2¾	2⅞	2.30	2¼	2.20	3.20	2.40
Confidence	4¼	4	3.95	3⅜	3⅜	....	5	3.80
Con Imperial	20c	15c	15c	10c	15c	10c	15c	10c
Con Virginia	2.30	2	2.05	1.90	1.95	1.85	2¼	1.90
Crown Point	2¼	2.10	2.10	1.90	2.15	1.90	1.90	1.65
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	1¼	....	....	....	1¼	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	75c	60c	60c	40c	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2.45	2¼	2.35	2¼	2.30	2.15	2.15	2
E. Mt. Diablo	15c	....	20c	15c	20c	15c	25c	20c
Eureka Con	....	....	28	25½	28	27	27½	27
Exchequer	1.30	1.10	1.35	1.15	1¼	1.05	1.35	1
Endowment	....	....	....	....	....	....	....	....
Grand Prize	15c	....	30c	5c	50c	35c	40c	....
Golden Gate	....	....	2½	....	2½	....	....	....
Goodshaw	65c	60c	55c	35c	....	....	50c	45c
Gould & Curry	7⅞	6⅞	7⅞	6⅞	7⅞	6⅞	9	7⅞
Hale & Norcross	4.40	3.60	4.20	3.80	4.05	3⅜	4.90	4
Head Center	1	....	1	....	1	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	45c	35c	45c	40c	40c	35c	50c	40c
Justice	85c	75c	80c	75c	75c	70c	90c	70c
Jackson	75c	....	....	....	....	....	....	....
Jupiter	25c	....	20c	10c	....	....	....	....
Kentuck	3	2.10	2.10	2	2	1.60	1.80	1.60
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	15c	....	....	....	20c	15c	20c	15c
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1⅛	....	2	....	1⅛	....	1⅛	....
Martin White	30c	20c	25c	....	50c	....	90c	60c
McClinton	10c	....	10c	....	....	....	10c	5c
Mono	3.90	3.65	3.90	3⅜	4	3.55	3.65	3.30
Mexican	11⅛	10⅛	10⅝	9⅛	10⅜	9⅛	14⅛	11⅛
Mt. Diablo	....	....	6	....	6⅜	....	6⅜	6¼
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1.55	1	1	90c	90c	60c	85c	45c
New York	20c	10c	15c	10c	....	....	20c	15c
Northern Belle	15⅞	14⅜	16	15⅞	17⅛	16⅞	17⅛	16⅛
North Noonday	70c	55c	65c	....	50c	....	....	....
Navajo	65c	....	40c	....	....	....	25c	....
Occidental	1.80	1⅛	1.90	1⅛	1⅛	....	1.55	1⅛
Ophir	7⅜	6⅜	6⅞	6⅜	6⅞	6⅜	9⅜	7
Original Keystone	....	....	....	....	....	....	....	....
Overman	2	1.20	1.90	1⅜	2	1⅜	2.90	2
Oro	50c	45c	50c	45c	50c	40c	45c	40c
Paris	25c	....	....	....	....	....	....	....
Potosi	3.35	3	3.20	2⅜	3.30	3	3.80	3.30
Queen Bee	....	....	5c	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	3.85	3.10	3.30	2.90	3.30	2⅜	3.80	3.05
Seg Belcher	6¾	....	6¾	6	8	6¼	9¼	7
Sierra Nevada	17	13⅞	17	13⅜	16⅞	14⅛	28½	19½
Silver Hill	15c	....	15c	10c	10c	....	15c	10c
Silver King	20½	20	20⅞	19⅛	19	15⅛	19	17
Succor	....	....	....	....	....	....	....	....
Summit	....	....	25c	....	25c	....	30c	25c
Scorpion	1.80	1.15	1.70	1⅛	1.70	1.55	2.55	1.85
Solid Silver	....	....	....	....	....	....	....	....
Sonth Bodie	5c	....	....	....	5c	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	50c	....	45c	40c	45c	....	40c	....
Tioga Con	45c	35c	40c	....	40c	25c	25c	....
Tiptop	5¾	5½	6	5⅞	5⅞	5⅜	5⅞	5½
Tuscarora	....	....	....	....	....	....	....	....
Union Con	14⅛	11⅞	14⅜	10	13⅜	12⅜	19½	15⅜
Utah	11⅜	10	11⅜	9⅛	10⅜	9⅛	14⅛	11
Ward	....	....	....	....	....	....	....	....
Wales	75c	50c	75c	60c	90c	80c	....	....
Yellow Jacket	6⅛	5⅞	6	5⅜	5⅞	4.60	6¼	5⅞

Sales at S. F. Stock Exchange.

Thursday A.M., Sept. 15.

100 Alpha ..... 4@4
230 Alta ..... 4.90@4.95
420 Andes 20
120 B & Belcher ..... 14@14½
1695 Belcher ..... 3@3.30
280 Bulliou ..... 1.30@1⅛
45 Benton ..... 1.05@1
305 California 1.05
1410 Con Virginia ..... 2.05@2.10
445 Chollar ..... 2.50@2⅝
540 Crown Point ..... 1.80@1.85
1050 Con Imperial 15c
75 Confidence ..... 3.80@4.10
560 Caledonia ..... 35@40c
325 Challenge ..... 95c@90c
560 Exchequer ..... 1@1.30
465 Gould & Curry ..... 8@8⅛
550 Hale & Nor ..... 4.35@4.40
500 Justice 90c
300 Julia ..... 45@50
375 Kentuck ..... 1.80@1⅞
500 Lady Wash 20c
805 Mexican ..... 13@13⅜
100 New York 15c
1000 New Wells Fargo 20c
330 Ophir ..... 8⅝@8⅞
175 Orig Gold Hill ..... 15@20c
2195 Overman ..... 2.65@2.85
50 Occidental 1⅛
870 Potosi ..... 3@3.65
600 Sierra Nevada ..... 25½@26
245 Savage ..... 3⅜@3.55
585 Silver Hill ..... 15@10c
845 Scorpion ..... 2.55@2.50
105 Sierra 75c
270 Utah ..... 13⅜@13
920 Union ..... 18@18⅝
365 Yellow Jacket ..... 5½@5⅝

AFTERNOON SESSION.

585 Albion ..... 1@1.65
300 Black Hawk 15c
525 Belle Isle ..... 15@25c
50 Bulwer 2½
50 Bodie 8⅞
110 Bodie Tunnel 1.80
595 Day 2.05
250 E Mt Diablo 25c
400 Goodshaw 45c
65 Mammoth 5c
50 Mono 3.10
50 McClinton 5c
50 Manhattan 1⅛
110 Northern Belle ..... 15⅞@15½
200 Navajo 25c
340 N Belle Is 30c
200 Noonday 50c
320 Oro ..... 40@35c
50 Summit 25c
200 Silver King 18⅛
100 Syndicate 25c
250 Tioga Con 20c
350 Tiptop ..... 5⅝@6

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Western, Sept. 6th, $12,162; Standard Con., 5th, $47,359.09; Northern Belle, 7th, $6,699.42; Head Center, 11th, $4,800; Syndicate, 6th, $6,-610.52; Bodie Con., 12th, $6,283; Northern Belle, 10th, $12,137; Barbee & Walker, 5th, $3,053; Horn Silver, 5th, $10,553; Germania, 5th, $5,700.

THE excitement about the Safford district, the new mining camp near Palisade, on the Central Pacific, is unabated. Very rich rock is being brought to Eureka from the district, and mining men are very enthusiastic.

THE probable bullion yield for the Butte mining district for the year 1881 [will be $6,000,000.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes M Co	Nevada	17	50	Aug 8	Sept 14	Oct 3	B Burns	309 Montgomery st
Argenta M Co	Nevada	9	10	Sept 5	Oct 7	Oct 28	F M Hall	327 Pine st
Alta S M Co	Nevada	21	50	Aug 2	Sept 6	Sept 26	W H Watson	302 Montgomery st
Albion Cou Co	Nevada	8	40	Aug 1	Sept 6	Sept 26	D B Chisholm	327 Pine st
Belle Isle M Co	Nevada	3	10	Sept 13	Oct 18	Nov 8	E M Hall	327 Pine st
Belmont M Co	Nevada	28	15	July 27	Aug 30	Sept 26	J W Pew	310 Pine st
Belcher M Co	Nevada	6	50	Aug 29	Sept 30	Oct 21	W E Dean	309 Montgomery st
Con Amador	California	2	1 00	Aug 3	Sept 6	Sept 24	F B Latham	328 Montgomery st
Con Imperial	Nevada	16	10	Aug 22	Sept 27	Oct 18	W E Deau	309 Montgomery st
Con Virginia M Co	Nevada	16	30	Aug 2	Sept 24	Oct 22	A W Havens	309 Montgomery st
Crown Point G & S M Co	Nevada	45	75	Sept 7	Oct 12	Nov 2	Jas S Newlands	327 Pine st
Grand Prize M Co	Nevada	6	25	July 30	Sept 8	Sept 29	E M Hall	327 Pine st
Independence M Co	Nevada	8	15	Aug 25	Sept 26	Oct 17	E M Hall	327 Pine st
Juniata Con M Co	Nevada	5	04	Aug 18	Sept 19	Oct 8	C V Hubbard	310 Pine st
Justice M Co	Nevada	35	25	Sept 13	Oct 18	Nov 8	R E Kelly	419 California st
Kentuck M Co	Nevada	16	50	Aug 22	Sept 26	Oct 17	A C Stuart	234 Montgomery st
Meadow Valley M Co	Nevada	15	30	Aug 1	Sept 10	Oct 4	H DeLaguna	414 California st
Mono M Co	California	13	50	Aug 6	Sept 12	Oct 3	W H Lent	309 Montgomery st
Mt Potosi M Co	Nevada	7	15	Aug 12	Sept 17	Oct 10	J H Sayre	330 Pine st
Murchie G & S M Co	Nevada	7	15	Sept 7	Oct 11	Nov 10	Wm Letts Oliver	328 Montgomery st
Occidental Con Gravel M Co	California	8	06	Aug 22	Oct 3	Oct 26	W T Smith	414 California st
Oneida M Co	California	15	3 00	July 21	Aug 29	Sept 20	H P Bush	431 California st
Potosi M Co	Nevada	6	50	Aug 29	Oct 4	Oct 25	W E Dean	309 Montgomery st
Seg Belcher M Co	Nevada	19	1 00	Aug 3	Sept 6	Sept 27	G D Edwards	414 California st
Silver Hill M Co	Nevada	10	25	Aug 16	Sept 19	Sept 10	W E Dean	309 Montgomery st
Tioga Con M Co	California	14	20	Aug 16	Sept 22	Oct 12	W H Lent	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M Co	California	3	15	Aug 22	Sept 22	Oct 10	J M Buffington	309 California st
Alpha Hydraulic M Co	California	3	25	Aug 20	Sept 27	Oct 18	J Ireland	216 Sansome st
Bengal M Co	Arizona	1	02	Aug 31	Oct 7	Oct 29	J H Sayre	330 Pine st
Defiance G M Co	California	6	05	Aug 26	Sept 30	Oct 20	W H Lent	309 Montgomery st
Delano M Co	California	2	03	Aug 13	Sept 16	Oct 7	J Morizo	328 Montgomery st
East Noonday M Co	California	2	05	Aug 2	Sept 8	Sept 24	C V Hubbard	310 Pine st
Golden Fleece M Co	California	22	40 00	July 28	Sept 3	Sept 22	Fr Schirmeier	735 Folsom st
Harrington M Co	California	2	05	June 15	Sept 14	Oct 4	O C Muller	409 California st
Iowa M Co	Nevada	14	05	July 27	Sept 12	Oct 5	C S Leavitt	411½ California st
May Flower C M Co	California	12	10	July 19	Sept 7	Sept 28	J Morizo	328 Montgomery st
New Basel Con Gravel M Co	California	—	10	Aug 25	Oct 1	Oct 20	F X Simon	525 Commercial st
North Gould & Curry G & S M Co	Nevada	1	25	July 5	Sept 15	Oct 12	M C Southard	331 Montgomery st
Navajo M Co	Nevada	8	25	Aug 19	Sept 22	Oct 13	J W Pew	310 Montgomery st
Oro M Co	California	9	25	Aug 16	Sept 21	Oct 12	W Stuart	320 Sansome st
Oakland M Co	California	16	05	July 30	Aug 31	Sept 19	R D Hopkins	436 Montgomery st
Peahody G M Co	California	1	044	Aug 31	Oct 3	Oct 21	R D Hopkins	317 Montgomery st
Santa Anita M Co	California	1	13	Aug 20	Sept 25	Oct 10	J B Titus	34 Kearny st
Sherwood M Co	Nevada	3	05	Aug 11	Sept 19	Sept 10	J M Buffington	309 California st
South Hite M Co	California	2	10	Sept 1	Oct 5	Oct 29	T A Berlin	515 California st
Spaulding G & S M Co	California	2	10	June 28	Sept 23	Oct 21	J W Pew	310 Pine st
University G M Co	California	9	10	Aug 15	Sept 20	Oct 12	Wm. L Oliver	328 Montgomery st
Western Home Con M Co	Idaho	2	05	Aug 16	Sept 26	Oct 26	A Halsey	328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Booker Con M Co	California	W H Lent	309 Montgomery st	Annual	Sept 26
Belle Isle M Co	Nevada	E M Hall	327 Pine st	Annual	Oct 2
Day M Co	California	J M Pew	310 Pine st	Annual	Sept 20
Flowery M Co	Nevada	W W Stetson	309 Montgomery st	Annual	Sept 20
Golden Gate Con	California	J T McGeoghegan	318 Pine st	Annual	Oct 3
Grand Prize M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 20
Hill Side M Co	California	F Frankenthal	330 Pine st	Stockholders	Sept 19
Juptier M Co	California	C B Hubbard	310 Pnic st	Annual	Sept 19
Miut M Co	California	H H Haskell	526 California st	Annual	Sept 26
North Bonanza M Co	Nevada	W W Stetson	309 Montgomery st	Annual	Sept 20
Tellurium G & S M Co	———	M Litchfield	419 Montgomery st	Annual	Sept 19
Wolverine M Co	———	C E Vail	328 Front st	Annual	Sept 14

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Aug 27
Father De Smet M Co	Dakota	H Dean	New York	50	June 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Aug 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Aug 15
Silver King M Co	Arizona	J Nash	315 California st	25	Aug 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Aug 12
Tip Top M Co	Arizona	H Dean	309 Montgomery st	20	Aug 25
Western M Co	California	C S Curtiss	309 Montgomery st	75	Sept 8

The Mining Share Market.

Our stock tables will show how much of an excitement there has been this week in the stock market. This has been principally due to the report of a strike in the Sierra Nevada.

All that could have possibly given rise to the report of a rich body of ore in the Sierra Nevada is the fact that the joint Sierra Nevada and Union Con. winze ran into a stringer of ore about 15 ft. below the 2700 level. It amounts to nothing greater than a dozen or more like stringers encountered in the same winze from the 2400 level down.

The Gold Hills *News*, which is probably posted on the situation on the Comstock says: There is not any work being done in the bottom of the joint Sierra Nevada and Union Con. winze. A drift is being run from this winze on the 2700 level that is supposed to have run into stringers of ore or into a small sized ore body. The supposition is indulged in by outsiders, and it is doubtful if they know much about it. Senator Fair is not yet inclined to unbosom himself, and until he does speak or permit mining experts to examine the reported strike, there will be nothing definitely known as to what the mine contains. It is to be hoped the rise in stocks is justified by the condition of the mine. If such is the case, there has been plenty of time to discover the fact, and it should be made known.

The only work carried on in the Bonanza series of mines the past week has been repairing. It is expected to place the old force of workmen back in a day or two, however. It was owing to the intense heat in the mines that the workmen were removed, but the ventilation is now rapidly improving. The Savage management promise to begin the extraction of low grade ore shortly. Considerable attention is attracted toward Chollar and Potosi. A crosscut is being run in the latter mine which is in kindly formation. A similar drift will be started in Chollar before long. Preparations are being made to work the Alpha joint with Imperial. Belcher has got to work at extracting low grade ore again, and will shortly be followed by Crown Point. The joint shaft of these two mines will be repaired by Monday next. The Justice mining company announce their intention to resume work shortly.

THE red clayey soils of California are the best fruit lands we have; that is, they will successfully produce a wider range of fruits than any other class of soils to be found in the State.

A FATAL shooting affair occurred at the Empire mine, Park city, Utah, on Sunday, resulting in the killing of Frank O'Reilly, the superintendent of the mine, by G. W. Scott, engineer of the same mine. The quarrel had its origin with O'Reilly, so Scott reports, and he says that he acted in self-defense, shooting the former three times as he advanced upon him with a knife. Scott fearing violence from O'Reilly's friends, gave himself up, and was brought to Salt Lake and lodged in jail. The affair has caused great excitement at Park city, as both parties were well known.

THE cost of working the copper mines of Lake Superior, Michigan, varies from 11 cents to 23 cents per pound of the ingots produced. The cost of the ingots from three of the mines for 1879 was as follows: Atlantic, 12.20, Central, 11.16, Quincy, 13.71. This is the best that either of these mines has done. Last year the Central's copper cost 11.85 to produce.

COULD investors be induced to realize that it is better to take slight chances on the loss of a small amount in the development of virgin claims than the greater loss on old, exhausted or nearly exhausted dividend mines, both themselves and the country would be great gainers. By a judicious selection of prospects the chance of loss is reduced to the minimum.

A LOT of concentrated ore from South mountain, says the Winnemucca *Silver State*, has arrived here for shipment to San Francisco. Base bullion by the wagon load may be expected here shortly from that camp, if reports from there are correct.

THE taking out of great quantities of gold at Klamath river, together with successful quartz, placer and hydraulic mining operations, promises to make times more prosperous in Siskiyou this fall than ever before, and especially in Yreka.

THE Morning Star mine at Leadville was recently sold for $1,300,000. The capital has hitherto been $6,000,000, but is to be reduced to $1,000,000 by the 1st of October, at which time the new owners come into full possession.

THE Mott claim, on the Klamath river, below Virginia Bar, is paying about $5 to $8 per day to the hand, and gradually improving as the work of sinking progresses.

THE Chrysolite mine paid a dividend of $100,000 on the 10th. It is said that a handsome surplus is carried forward.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

PURCHASED.—Amador *Dispatch*, Sept. 10: The Owen Kelly claim, on Murphy's ridge, about 2 miles from Jackson, toward the Mokelumne river, has been purchased by W. F. Walton for a Boston company, and work will be commenced upon the mine immediately. The claim is on what is known as the mother lode, and has always prospected well, and there is but little doubt that when this mine is developed it will make glad the hearts of the Bostonians who have just bought it.

ANOTHER clean-up was had at the Grass Valley gravel mine, near Volcano, owned by McLaughlin & Co., and superintended by Mr. L. McLaine, a few days ago, giving a much larger yield than ever before. Mr. McLaine brought the bullion to Jackson for shipment below last Tuesday, and feels much elated over the yield of the mine. There are several hundred acres in the claim, and it will require 15 or 20 years of constant work to work out the claim.

MR. JAMES MORGAN is still pushing his tuunel through Murphy's ridge from Hunt's gulch, though we believe he has not yet struck the main ledge for which he is drifting. The tunnel is now in about 1,200 ft, though not in a straight direction—making an angle about 400 ft from the mouth. We understand that a large number of very rich strata has been passed through, but they are not large enough to pay for extensive working. It is Mr. Morgan's intention to build a large mill in Hunt's gulch as soon as he strikes the main ledge with the tunnel.

THE MOYLE & DOYLE MINE, in Hunt's gulch, is down about 70 or 80 ft. and at that point the ledge is about 5 ft wide, and appears to be very rich. Drifting will be commenced in a few days, and the mine pretty thoroughly prospected to its present depth. The shaft has been sunk between two ledges, and we understand that they come together near the bottom of the present sinking, and there is every reason to believe that the mine will prove rich and permanent.

THE VOLUNTEER, owned by Mr. James Meehan, is now having the water pumped out preparatory to having the shaft sunk 100 or 200 ft deeper. The hoisting works have been completed, and Mr. Meehan informs us that he intends to push the work ahead, and develop the mine thoroughly without delay. The mine has heretofore produced some of the richest rock ever taken out in this vicinity, and miners say there is no reason why there is not plenty more rich rock still deeper down.

THE ZEILE MINE is steadily going on with its work, but, owing to scarcity of water, only about an average of 30 stamps of the mill have been kept running daily. The rock is of rather low grade, but by rather economic management the mine has been brought up to a paying basis, and there is every reason to believe it will prove a permanent institution of profit. The rock is remarkably regular, paying almost exactly the same in all parts of the mine. The ledge on the lower level is about 15 ft wide, and it will require many years to work the ore body out.

EL DORADO.

THE MINES.—El Dorado *Republican*, Sept. 8: So far as we have been able to learn, the mines being operated in this vicinity are at least holding their own, and we think a little better. The Placerville Cold Quartz is turning out some very fine ore. The Grand Victory is reported to be paying better than ever, under the new management. The Springfield is keeping up its lick on $20 ors. The Bowlder and Gophermill continue to crush upwards of 20 tons per day at a good profit, while the mine is being developed. It is almost needless to mention the Lyon in this connection as it is certain of constant and large profits for years to come. At the Chapparal, work in the tunnel has been temporarily discontinued, and the force put to work in the drifts leading from the shaft, where they are stoping out some fine ore. This work was abandoned last winter in consequence of more water than could be handled. Work in the tunnel leading to the main shaft will be resumed soon. Work is being pushed ahead in numerous other properties, but to what extent we are not advised. At Crizzly Flat the principal boom of the county seems to be holding sway at present. The new Arctic mill is running. The Mount Pleasant will have a new 20-stamp mill running in 00 days, and other mills and hoisting works are going up, while others are in contemplation. We believe that will be one of the most thrifty mining camps in the State by another summer.

INYO.

BEVERIDGE TO THE FRONT.—Inyo *Independent* Sept. 10: Taylor & McEvoy's 5-stamp mill is doing splendid work in Beveridge district; 11 tons of quartz is crushed every day. Five hundred tons have been worked since the mill commenced on "Keynot" ore. The average assay value of the ore is $118 per ton; average fineness of bullion, 720. The Keynot mine has produced about $100,000 during the past 4 months, and this with a 5-stamp mill, and a few arastras. In addition to the $100,000 from the Keynot, $8,000 has been taken from the mines owned by Taylor, McEvoy & Co. Other mines that are being prospected are showing up large quantities of rich ores.

MONO.

BODIE.—*Free Press*, Sept. 13: Among the agreeable features of the past week was the resumption of operations in the University and Spaulding mines. It looks well to see the work of development progressing in these valuable properties, where it has been so long suspended. The two Frue concentrators recently purchased by the Oro company are about ready to start up in connection with 5 stamps of the Silver Hill mill. Experienced men express the opinion that this is to prove a success, in which event more concentrators will be added. The Standard is again sinking the main shaft, which is down 1,064 ft. The Lent shaft is down 740 ft, and the flow of water is not very great. The lower winzes in the Bodie are in good ore, some of it being very rich. The west crosscut, 600 level of the Red Cloud shaft, is in 131 ft. Bodie tunnel, Bechtel and Syndicate are milling as usual, and satisfactorily. Con. Pacific, South Bulwer, Blackhawk, Tioga and Boston Con. are doing prospecting work. Work will be resumed in the Champion shortly.

MARIPOSA.

DILTZ MINE.—*Gazette*, Sept. 10: The fact of the extraordinary richness of this mine is just coming to the knowledge of many who have lived in close proximity for years, and would never have been any wiser but for the instrumentality of Col Swadley, who stirred Capt. Diltz up to an accounting of his valuable possessions, which amounted to a hank or mountain of gold with unlimited and inexhaustible resources as far as can be ascertained up to this time. Capt Diltz has evidently known for years the true character of this mine. Notwithstanding, the mine is bonded for a respectable amount, it does not in the least disturb the equanimity of Capt. Diltz, for he daily pursues the even tenor of his adopted course in developing this mine. The new shaft, which was commenced about August 1st, is sunk to a depth of 00 ft, and shows a vein of ore 3 ft wide, well charged with free, visible gold. The tunnel which starts in above the shaft and runs upon the vein 80 ft. The rock is decomposed to a considerable extent, with strata of ochre passing through it which carry gold of a surprising richness. The tunnel as it stands at the present time, affords a lift of 60 ft, and when it reaches the center of the hill as contemplated, a distance of 250 ft, it will give a lift of about 300 ft. It is contemplated, at some time in the future, to start a tunnel at a point known as the mouth of Sherlock's gulch, which, when run upon the vein, would give a lift of about 1,000 ft. At present there are 600 or 800 tons of ore on the dump, and as much more in sight, estimated at an average of not less than $30 a ton and upwards.

NEVADA.

GOLD FLAT EUREKA MINE.—Grass Valley *Union*, Sept. 8: The shaft of this mine, which is on Gold Flat, Nevada, is now down 130 ft, and the ledge is making a favorable showing. A crushing of 12 loads of the rock has just been cleaned up at Crosby's reduction works, which yielded $40 per ton including sulphurets. John Trenberth, known over all Grass Valley as a miner of many years experience, is superintending operations at the mine. He regards the New Eureka as a very encouraging "prospect."

DERBEC MINE.—*Transcript*, Sept. 8: The Derbec mine shipped over $15,000 worth of bullion last month, the last clean-up amounting to about $10,500. Very rich gravel is still coming from the old shaft. The new shaft has just passed through the quicksand where the pumps had so much water to contend with, and during the next 6 weeks it will undoubtedly enter the gravel channel. Instead of being compelled to distribute the gross proceeds of the mine among laborers and mechanics, the stockholders will doubtless realize good profits. The company is now employing over 100 men, and were it not for this the town of North Bloomfield would indeed be in a sad plight since the Marysvillians caused the closing down of the large hydraulic mine at that place.

GOLDEN GATE MINE.—The resumption of operations at the Golden Gate mine near Alleghany is adding greatly to the business interests of that section. Supt. T. Burke has a full crew of first-class men at work, and is pushing developments ahead rapidly. The new pumping and hoisting machinery works smoothly. Four Frue concentrators are being placed in the mill, which will start up in a few days and run regularly. The Golden Gate is in the same locality as the famous Rainbow mine, and we should not be surprised to hear before many weeks that Supt. Burke has uncovered a bonanza like unto the Rainbow's last one.

HOMEWARD BOUND MINE.—Grass Valley *Union*, Sept 8: Work on the Homeward Bound mine is to be immediately begun, and prosecuted with vigor. The mine was recently purchased by the Meaks Mining Co., and that incorporation intends to give the ground a thorough prospecting. The sum of $20,000 was paid for the mine, and the new company took possession on Friday of last week. M. C. Taylor has the contract for putting up all the necessary machinery, and everything will be in running order as soon as possible. The machinery will consist of two powerful engines, one of which will be 14-inch. There will be 2 pumps, one 11-inch and the other 8-inch. The main shaft will immediately be sunk to the tunnel level, 230 ft, and drifts will be driven both ways on the line of the tunnel. The tunnel has been commenced, a roadway dug out, a blacksmith shop is being built, and everything being put in readiness for the pushing of the tunnel ahead. The Meaks Mining Co. will shortly give employment to a large force of men, and when once work is fully under way, things will begin to look lively in Grass Valley.

PLUMAS.

DEVELOPMENT OF MINES.—Guernsville *Bulletin*, Sept 10: A company has been formed at Quincy for the development of mining property. The company proposes to have claims bonded to them for a sufficient time to enable them to prospect thoroughly; then, if the claim be found of value, either buy out or give the owner a stock interest. Miners who think they have good claims, but have not the money to work them, may, through the agency of this company, have their property fully developed.

PLACER.

THE LOWER FOOTHILL MINES.—Placer *Herald*, Sept. 7: The mining prospects in the lower portion of Placer are said to be looking up considerably. The Newcastle Mining Co's. claim, east of Pino, is being fitted up in good shape for the winter season, and the Laird mine in the same vicinity is said to be running on better gravel than has ever before been found in the claim. Other developments of an important character are being made in the same district, which we cannot refer to at present for want of particulars.

CLEAN-UP.—Placer *Times*, Sept. 8: The Polar Star hydraulic mine shut down for this season yesterday. At least the final clean-up was made then. The present season's run has been a very remunerative one to the owners of this mine, so we understand. If the present mining suits are favorably settled, it is the intention of the Supt. N. Orceuman to fit up both the Polar Star and Southern Crose mines in good shape for next season, provided adjustments in the suits is brought in time this fall. We understand it will cost in the neighborhood of $10,000 to fit up both claims again.

SIERRA.

SAVAGE MINE.—*Mountain Messenger*, Sept. 10: Last week we visited the Savage placer mine, located near the Middle Yuba Sierra county, about 10 miles southeast of Downieville. The company have a fine large tunnel, over 1,000 ft long, through hard granite all the way. At the end of this they are pushing an upraise, finding the rock a little softer as they go up. The drilling is done by the aid of compressed air, which works to a charm. The shaft is up about 50 ft. The company have a fine engine and all the necessary appliances. The situation of the mouth of the tunnel is one of the wildest and ruggedest imaginable, being on the face of a rocky cliff 1,300 ft below the old Henness Pass road. A good wagon road has been built from the road to the mine—that is, it is a good road to go down if the brake and breechin hold. Supt. Ball showed us through the works. About 15 men are employed. It is our opinion that the tunnel is full low for the channel, which undoubtedly lies under the ridge, which is an error in the right direction. The altitude of the mouth of the tunnel is 5,175 ft.

THOCEAXN and One Gravel Co., Sierra City, contemplate sinking in the main tunnel for bedrock. One thousand ft of air pipe, 5½ inches, will be put in the main tunnel. The pipe is to be made by Brown & Ward, Downieville. Bedrock is figured to be from 16 to 18 ft below the main tunnel.

SHASTA.

FRENCH GULCH.—Cor. Shasta *Courier*, Sept. 10: The quartz mines and prospectors are going ahead just as they would were there no comet, taking out rich rock for winter and prospecting. The recent find by one of the McDonald Bros. on the Gibson Bros. claim, which was amicably arranged, is still prospecting hugely. Mr. Coesell is still on East Fork, and making expensee prospecting for quartz.

NEVADA.

WASHOE DISTRICT.

CALEDONIA.—*Enterprise*, Sept. 13: Pumps have been run an average of 7 houre per day, consuming an average of 4 2-7 cords of wood per day. At the Formau shaft we have extended the Sutro tunnel drift 35 ft. Will complete upraise from pump station to-day and complete bob station to-morrow.

OVERMAN.—South drift, 2275 level, has been advanced 19 ft. Have cut 143 ft of drain and put in 10 sets of timbers in north drift. No work was done on the 4th inst. At the Forman shaft the Sutro tunnel drift has been advanced 35 ft. Will complete upraise from pump station to-day.

SIERRA NEVADA.—The drift west from the 2700 level of the winze joint with Union Consolidated was advanced 17 ft. During the week have been cutting out drain and laying track in the east drift from the shaft.

POTOSI.—The crosscut has been advanced 20 ft. The last 28 ft being in a mixture of clay and porphyry. The best in the crosscut is intense.

CHOLLAR-NORCROSS-SAVAGE SHAFT.—The hydraulic pumps are running satisfactorily. The old pumps are still undergoing repairs.

GOULD & CURRY AND BEST & BELCHER SHAFT.—The shaft has attained a depth of 2,160 ft. Have stopped sinking and are now cutting out for balance bob No. 8 and stationary pump at the 2118 level.

CON. IMPERIAL.—Operations during the past week have been confined to the 2100 level, where preparatory work is being done looking to the reopening of the Imperial and Alpha joint winze.

HALE & NORCROSS.—Having extensive repairs to make to the incline and shaft, have stopped sinking the winze at a point 127 ft below the 2400 level. The bottom is in hard east country rock.

SUTRO TUNNEL.—Main tunnel, removed 19 old sets, 13 posts, 0 caps and 0 old drain boxes, and placed in position 30 new sets, 7 timbers, 10 posts and caps. The small sub drain being excavated between the Combination and the intersection of the south lateral with the main tunnel has been extended to the 10,100 point. The usual repairs on the track along the main line have also been made. At last report the south lateral branch had attained a total length of 3,500 ft from the Julia turning point. During the past week the header has been advanced 71 ft, making the distance now 4,721 ft, and the distance from the Jacket turning point 1,082 23; distance from the Kentuck south line, 495.89; distance of the header to Crown Point south line, 203 85, and to the Forman shaft 2,340 08. Vein at 4,035 point south lateral: The north prospect drift has been repaired, but has not been extended since last report. The south prospect drift has been advanced a total length of 26 ft. At a point 21 ft from the mouth of the drift a crosscut was started. On the left hand side of the face clay seams were cut, which indicate the immediate neighborhood of the vein. The flow of water from the main tunnel is equal to 5,376,960 gallons per 24 hours.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, Sept. 10: The shaft levels present about the same appearance as last week, showing no change either in quantity or quality of ore produced. In the 11th level a development has been made, showing ore 20 inches wide, which looks quite promising for opening into a good body. The section of the mine above the adit level is looking well and continues its usual yield. The development above the 4th looks full as well as a week ago. Other parts of the mine show no changes of importance. All work is progressing in a satisfactory manner, and about 88 tons of ore is being daily extracted and sent to the mills. Both mills are running steadily and doing the usual amount of work. Total bullion shipments on August account, $107,201.01. Shipments on September account to Sept. 7th, $14,502.43.

MOUNT DIABLO.—Winze No. 1, on the 3d level, shows no change. A drift has been started easterly from the bottom of winze No. 2, and the face is showing a 24-ft ledge of $40 to $50 ore. Winze No. 3 is down 72 ft, and presents no change from last report. The east drift on the 3d level looks very promising for opening, there being ore in most of its face. In the west drift, 2d level, there is an 18-inch streak of ore which assays from $80 to $75 per ton. On the 1st level, west of the shaft, a drift has struck a seam of very good ore, which is looking well and promising better for the future.

EDEN DISTRICT.

RICH SILVER OAKS.—*Silver State:* Wm. Hudson, of Golconda, has discovered a ledge in Eden range, some 12 or 14 miles north of that station, which carries silver ore that assays from $200 to $1,000 per ton. He is at work opening the lead, and the prospects of finding a good mine are said to be very encouraging. It is located in the eastern part of Eden district, which was organized a year or two since by Jas. Farrell.

EUREKA DISTRICT.

THE SATELITE.—*Herald*, Sept. 9: The owners of this mine are going to work in dead earnest to develop it. On yesterday the place for sinking the shaft was determined upon, and in to-day's *Leader* will be found an advertisement for proposals for sinking one of 8 by 5 in dimensions to the depth of 100 ft. It is in one of the most favorable locations in the district for opening up a paying ore body, and the work upon it will be pushed forward as fast as men and money can do it. It will be but a comparatively short time before the Satelite will create a sensation in Eureka mining circles.

THE BLACK HAWK TUNNEL.—John McKenna informs us that the Black Hawk tunnel, in New York canyon, is being worked steadily by himself and others, and that some very encouraging prospects have been encountered. The tunnel is located about 100 yards above the "Seventy-Six" Company's hoisting works. It is now in about 500 ft, and still driving ahead. At a distance of 365 ft a very promising ledge was struck, and the work is now in a kindly formation.

I X L DISTRICT.

ENCOURAGING.—Eureka *Leader*, Sept. 9: Jim Allen informs us that he has most encouraging reports from his claims at I X L district, in Churchill county. He says the Eastern Star mine, in which himself and other Eurekans are interested, has just been bonded to San Francisco capitalists for $12,000, and the prospects are the best in the world for a sale. He also says that the Bayfield and other claims in I X L are looking splendidly, and it is his opinion that the district is on the verge of quite a little boom. For Jim's sake and the sake of other Eurekans who are interested in the property, we hope that I X L will come prominently to the front.

ARIZONA.

SILVER DISTRICT.—*Sentinel*, Sept. 10: The assays from Lost mine are: No 1, $1,410.33; No. 2, average of unassorted waste dump, $11.33; waste dump, average, $9 42, silver, per ton. Average of entire shaft not yet taken. These are not fancy assays, but the average of what is coming from, and that which is in the shaft to-day. The Meeora mine is rapidly coming to the front, and the similarity of gangue and ore to Lost mine, is clearly defined, bold outcrop, and other favorable indications, pronounce it a mine of intrinsic value. The Canteen mine, (Frank Vomicil), and the first northwest extension from the Lost mine, will soon be opened by the owner, who with other property owners in that part of the district are enthused by the splendid prospect the Chicago Co have in their Lost mine; and development of the various claims will bring East Silver district into enviable prominence in the early future.

SILVER DISTRICT.—Globe *Chronicle*, Sept. 6: On the Black Rock 16 men are at work on the breast, opening a cut to sink a shaft. The force on the breast just north of "old Hayes' incline" shaft are in good pay rock, and the result consequent is the enlargement of the pay dump. A wagon road is being constructed across the mesa, around which the stage road now winds at Black Rock, to facilitate loading ores from that mine when transporting to the company's mill on the river. A rich strike in the largest body of milling ore proper, in quartz, yet made in the district occurred in the Loet mine, in cut No. 2, last week. Black sulphurets from the surface returned an assay of $309.25 per ton silver. First-class miners now get $3.50 per day and find themselves, and there is a demand for them at Black Rock mine.

TOMBSTONE DISTRICT.—*Epitaph*, Sept. 7: By courtesy of Supt. Church, the *Epitaph* has been favored with the result of the August run of 25 days, of the Tombstone Co's. mills, which, it will be seen, is but $5,758 short of that of June, the best run ever made in the district, and $8,487 better than July. The returns for the 3 months were as follows: June, $157,553; July, $143,308; August, $151,705; total, $452,656. Here is a showing that ought to satisfy the most exacting shareholder, and one that every person interested in the district may point to with pride.

The shaft on the Flora Morrison is now down 210 ft., and at 40 ft. deeper a station will be put in and crosscutting the ledge to the west will begin. Occasionally large pieces of ore fall out of the ledge, which looks remarkably well. Very promising developments are being made on the westerly extension of the main mineral belt. A strike has been made this week in the Elden Lass, showing at a depth of 90 ft. horn silver and ore assaying $3,500 per ton. The Belle also shows some $100 ore at a depth of 98 ft. A contract has been let to sink a 100 foot shaft on the Arizona May, a promising prospect owned by San Francisco parties, in the immediate vicinity of the Mamie and Junetta, both of which are looking well. The breast of ore on the 300 level of the Grand Central measures 35 ft wide, all of good quality. The incline at the bottom of the new shaft of the Stonewall is down 40 ft., which makes the total depth 90 ft. The cross-cut on the 50 level revealed 28 ft of ore. The Ingersoll is turning out ore as usual, which steadily increases upon the dump, that now has about 1,000 tons awaiting the stamps.

GLOBE DISTRICT.—Globe *Chronicle*, Sept. 9: Owing to the anticipated Indian troubles during the past week, and the excitement caused thereby, work on nearly all the properties has been temporarily suspended. We have not made our usual weekly trip among the mines, but learn from parties working in the Mack Morris, Stonewall No. 1, South Pioneer, Old Dominion, Borva, Alice and Eneline, that the ore bodies are looking larger and better than ever. Mineral Creek mill has been making a steady run ever since it first started up, but there being no fire arms available, the Superintendent deemed it advisable to shut down for a few days, in view of the probable Indian outbreak, and with the exception of two or three men who are guarding the property, all hands from the mill and mine came to town on Tuesday last, and will remain until the excitement, to some extent ceases. The services of Mr. Lamliss, one of the best amalgamators in the country, have been secured at this mill. He talks very encouragingly of the prospects, and says the mill is perfect in every detail, which speaks well for Supt. Cooper, under whose supervision it has been thoroughly overhauled and remodeled. The ore is yielding on an average from $30 to $35 per ton in silver, and there being an immense body in sight, there is no question but that the mill will be constantly supplied, and run to its fullest capacity, which will soon place the property on a dividend paying basis.

COLORADO.

SALE OF THE BAKER.—Georgetown *Courier*, Sept 8: We are reliably informed that a sale of the once famous Baker mine had been consummated this week to a party of New York and Philadelphia gentlemen at a large figure, and that a new company, with a capital stock of $2,000,000 has been organized to work it on an extensive scale. Besides the Baker claim the sale comprises the Argentuun, Elma, Grace H. Bell, Standard and Compromise lodes, which give the company about 4,000 linear ft on the main ledge. What was originally known as the Baker lode now comprises 3 lodes—the Elma, or south vein; the Baker, or middle vein, and the Argentum, or north vein, all 3 of these veins having formerly been worked by the old Baker company.

THE A.-P. TUNNEL STRIKE.—From Dr. McKenney, the superintendent of the west end of the A.-P. tunnel, who came over from Chihuahua last Saturday, we learn that the recent strike continues to show improvement as the developments progress. The drift on the lode is now 60 ft long, and shows an ore vein that is continuous. Since our last notice 18 ft have been driven, and the vein of solid smelting ore has increased from 15 to 30 inches in thickness, and a late assay shows its value to be 51 ozs of silver and 9-10 ounce gold per ton, and 61¾ lead.

STRIKE ON WILLIAM'S FORK.—Indefinite reports have reached town regarding a big strike of ore on William's Fork by Thos. Webb and John Sanders of this place. The boys have been engaged at driving a crosscut tunnel for one of their lodes, which on Thursday of last week, at a distance of about 60 ft, intersected a very large body of smelting ore.

CAMP CLIFFORD.—Camp Clifford, situated at the head of York gulch, which was not known as a mining section until within the past 2 years, now boasts of 3 paying mines. The main shaft on the Clifford is down to a depth of 175 ft, and sinking and drifting are both going forward. There is a large amount of ore on hand in the shaft-house, which will mill 500 ozs of silver to the ton. The Ranchman is the extension of the Clifford, and is owned by Robert Thompson, of Chicago, and Jerry Quigley, of Loveland.

DAILY DISTRICT.—Clay and Mart Cowles & Gus Williams have recently located a number of claims in South Dally, near the Mountain Ram and Ruby lodes, all of which show good streaks of high-grade ore, assaying from 200 to 1,000 ozs of silver to the ton. All of the lodes in this locality show very high-grade ore, and development is all that is needed to make them pay.

DECATUR.—It is reported at Decatur that the Chihuahua concentrating mill, which was recently bid in by Mr. C. R. Fish, of Georgetown, is to be run in the future as a sampling and ore purchasing establishment by Mr. Fish and L. W. Aldrich. If this is done it will be a great benefit to the miners of Peru district, for it will make a market for small lots of ore and induce prospectors to develop their claims.

The latest thing is the talk of a new town at the forks of the creek, 3 miles below Chihuahua and 2½ miles below Montezuma. The railroad has been surveyed up to this point, and it is expected that it will be completed before winter, and as there is no immediate prospect of its being built beyond that place it will probably be the distributing point for that section. Messrs. Mitchel, Squires and Greer have already made arrangements for the erection of a 3-story hotel. They have the lumber on the ground, and are now grading for the building.

SOME of the mines on Lenawee mountain are turning out very rich ore.

DAKOTA.

RUBY GULCH GOLD.—Black Hills *Miner*, Sept. 3: Mr. Moll, an old miner, exhibited a sack full of gold nuggets that were taken from Ruby gulch. He says that since the discovery there has been over $20,000 in coarse gold taken from the Ruby gulch. Ed Collins has been at work for a long time with a force of men building a ditch and flume across to convey water for hydraulic purposes to these diggings.

THE Sitting Bull mine is shipping to the Omaha smelter a ton of ore a day, and this ore is supposed to mill not less than 600 ozs a ton. There is now on the dump of Sitting Bull 1,500 tons of ore that will go 100 ozs to the ton. The Red Jacket is taking out ore and preparing for shipping it to Omaha that will average 130 ozs to the ton.

FRANK BRYANT, superintendent of the Aurora mining company, came in from the carbonate camp last evening, and is full of hope for the future of that district. He says he has assayed ore that came from the Wilkinson mine that went $1,354.44 per ton, and he regards that as tolerable rock. It only requires development in his opinion to make the mines of that camp bonanzas, and Frank is one of the miners that will stay with it to the end.

A MEETING was held at West Virginia the other day, and it was made a rule by the miners that in the $100 that must be expended in labor each year on each claim that a full day's labor should be $5, and the work must be a faithful 10 hours' labor each day, and should show for itself. The office of recorder for the district was abolished, and instead Mr. Redpath was elected Secretary.

MONTANA.

CLEAR GRIT.—*Inter-Mountain*, Sept. 7: This very valuable property, situated north of Butte in the immediate vicinity of the Acquisition spur, is being put in shape by its owners to develop it to a depth of 500 ft without delay. It now has a shaft sunk on it to a depth of 58 ft, and has already yielded over $41,000 at that depth. The Clear Grit M. Co are getting machinery of the best manufacture, and are erecting a large shaft house, similar in design to that of the Stevens. The pitch of the Clear Grit is about 60° to the southwest, and it promises to be one of Butte's standard bullion producers.

MILLS AND SMELTERS.—The old Alice mill, after a thorough overhauling, was fired up again on Monday and is now pronounced as good as ever. On the southeast corner of the new Alice mill a big building is in process of erection, in which, when completed externally, a Bruckner furnace will be erected. Its chloridizing capacity will be almost as great as that of a 60-inch Howell cylinder, and its cost considerably less. On its completion it will be no longer necessary for any of the stamps to work on free ore as the capacity of three furnaces will be amply sufficient to provide for the chlorination of all the ore which 60 stamps can crush. The operation of the additional furnace will result in an increased bullion product, the fineness of which will be greater than heretofore. The percentage of chlorination in the Alice mill yesterday was higher than ever before, being 97.41. The tailings assayed only 44 cents. What mill on the Pacific coast working on base ore can beat that splendid showing? The Moulton 40-stamp mill is fast approaching completion. The pans and settlers, the two revolving dryers, one of the roasting furnaces and the battery timbers are all in place. The other furnace is almost finished and the stamps will be hoisted within a few days. The mill will not start until immediately as the water ditch from Yankee Doodle will not be ready to convey water for about a month. Excavation for the Lexington mill is proceeding as rapidly as possible, and the contracts for its construction have nearly all been let. The main building of the Bell smelter is already looming up, and the brick-work will begin without delay. The group of mines lying north of Walkerville are nearly all in process of active development and are showing up some fine ore bodies. Explorations on the 300 level of the Bell are prodneing as usual, and the ore body looks better than ever. The correctness of Prof. Clayton's report on the property is now readily conceded by all who examine the mine. The Alice mine is in splendid shape, and the same may be said of the Magna Charta, in which the north and south 300-ft crosscuts are opening up immense bodies of ore. The Bell of Butte is yielding a large amount of good ore, which is being shipped for reduction to Silver Bow mill. The main shaft of the Star of the West has attained a depth of 180 ft and sinking actively progresses. The recent improvement in the quality of the ore continues and the drifts which will be extended on the vein at a depth of 200 ft are expected to open up a rich body of smelting ore. The lessees of the Bummer are realizing a handsome profit from the property. Crosscutting from the bottom of Orey Rock shaft is vigorously prosecuted. The main ledge at a depth of 72 ft was 23 ft wide, as opened up by a south crosscut from what is called the west shaft. Fifty ft nearer the surface it was but 8 ft wide, and if the rate of increase should continue, the ledge when tapped from the 300 station will show the largest body of ore ever uncovered in the district. On the Lexington splendid headway is being made in sinking the main shaft, the energy displayed in the work being well worth emulation. In the old workings operations are confined to the extension of the drifts from the bottom of the 70 ft winze sunk in the 60 level under shaft No. 2. A magnificent body of high grade silver ore and assaying well in gold is being explored.

OPERATIONS.—*Inter-Mountain*, Sept. 9: The mining boom which has lately struck Butte is based on the indisputable richness, extent and prominence of the finest group of mines on the continent, and is constantly increasing with the investment of capital, which is directed to this great camp by the favorable reports of all intelligent men who have examined into its resources. The latest big mining operation to report is the bonding of the Moose for $75,000. This promising property lies a few hundred ft south of the east end of the Magna Charta, and is developed by four shafts, the deepest of which is 90 ft. It is owned by Farrer, Johnson & Larabie, and the bondees are John Longmaid & Co., who, it is presumed, are acting in the interest of Eastern parties. It is also reliably reported that Joseph Lacaff has sold the remainder of his lease on the Anselmo, which expires in March next, for $20,000. The Anselmo still shows an abundance of ore between the 400 and 500 levels, and there is little doubt that the purchaser has made a good buy. One year ago Mr. Lacaff was offered $40,000 for his lease, which, fortunately for himself, he refused. The Right Bower, a prospect lying some distance northwest of the Alice, has been bonded by its owners, Peter McMahon & Co., to Charles Cellis and others for $25,000.

IDAHO.

THE QUARTZBURG MINES.—*Idaho Statesman*, Sept. 6 From Mr. Maddox, who came down from Quartzburg on Friday last, we learn that the owners of the Confederate claim (Callahan, Quinn, Bryan and others) have struck an ore body about 3 ft thick, and full of free gold. The long existing difficulty between these parties and the Gold Hill Co. has been compromised by an agreement by which the Confederates take all the ground above water level in the gulch, and the Gold Hill Co. take all below it. A crushing of about 150 tons of Confederate ore made recently at the Gold Hill mill, yielded a trifle over $25,000, or an average of $166.00 to the ton. This is the work of 0 mens since last October, and the great hight of the mountain gives abundant proof that the ledge is of ancient formation. The Gold Hill Co. has shown good sense by keeping out of litigation. Taking the entire outlook, it is a good one for Quartzburg, which bids fair to become as important a quartz camp to Idaho as Sutter Creek is to California.

ANOTHER LUCKY STRIKE.—Wood River *Miner*, Sept. 10: E. D. Browne and J. Fox formed a partnership about a month ago, and went up the river a short distance above the smelter to prosecute the business of burning lime. They settled in Greenhorn gulch, and located a claim accessible to timber and good lime rock. The quality of lime gave satisfaction, and soon a brisk business was in operation. In getting out 100 tons of lime rock, to be used as flux by the smelter, Mr. Browne struck a body of ore 5 ft thick, consisting of carbonate and galena. Good indications appeared about a week ago when a seam of iron was struck, which induced Mr. Browne to stake it off. Last Saturday the bonanza showed up. An assay realized 100 ounces silver. Mr. Browne intimates his intention of retiring from the lime business and following up his new bonanza.

OREGON.

GALICE CREEK.—*Democratic Times*, Sept. 9: Walter Simmons and Lewis McElvey have purchased a claim on Galice creek and will commence at once to put it in shape for winter. A clean-up was made at the Applegate Gravel M. Co.'s diggings, managed by Dan Silva, last week. Several hundred dollars in gold dust was the result. Benner & Co. have manufactured a large amount of flume lumber at Big Butte for the Centennial mine and propose inaugurating extensive operations next winter. Tunnelling is going on with encouraging results. Several men are now engaged in putting the Squaw Lake Ditch to rights in order, and operations may be resumed next winter. A new dam is being put in at the head of the ditch, which is also being cleaned out, and the bulkheads will also probably be replaced at an early date. It is reported that Richard Hadley discovered a fine quartz ledge on Steamboat a few days ago, that prospects exceedingly well and promises to be of good size. Some of the ore has been pounded up and proved quite rich. John Bolt is interested in the discovery. Some excitement exists on Applegate in consequence thereof.

UTAH.

SILVER REEF.—Salt Lake *Tribune*, Sept. 6: We learn from a gentleman just from Silver Reef that the prospects of that mining camp were never brighter than now. There is a fine strike made in the Savage shaft of the Buckeye property of good ore. The strike is in the bottom of the shaft, 275 ft from the surface, and seems to be a continuation of the ore bodies of the Buckeye. This shaft was not started on any vein, and had nothing to follow from the top. But, previous to the strike, small pockets of ore were found from time to time in the rock. The discovery is of especial value as domonstrating the presence of good ore at a greater depth than heretofore found in that portion of the Reef. The strike in the Savage is of great value as showing the continuity of the upper ore bodies with the lower, and substantially making just so much of an ore reserve upon which calculations of present value may be based. In the same direction is the result of the prospecting in the old Leeds Co's works. Developments have been making without cessation in their ground, and now with the price of labor, the miners are now working at $3 per day for surface bounds, $3.50 for underground work, and $4 when the water is troublesome.

The New Mines in Antelope Valley.

The Bridgeport *Union* (Mono county) eays: On Wednesday, while in Antelope valley, we thonght we would visit the new copper mine the Antelopere are so much exoited over, and satisfy ourselves as to its merite. The Unole Billy is located in a gulch that makes into the canyon from the west. A roomy seven-foot tunnel has heen run in about 30 ft. on the east side of the ledge, the breest of which showe a strong ledge of good copper-bearing ore. Wc found on the dump many fine pieces of the red oxyd, and some of gray and black, hut the bulk of the ore appears to he of the red oxyd quality. The ledge looks nnusnally promising so near the croppings—only 400 ft. helow the crest of the hill. The tunnel will be continued 50 ft. further, when a winze will he eunk 50 ft., at which depth the ledge will he cut, when it is thought a paying eilver mine will be developed, as ore taken from the present workings assayed $17 in silver, a trace of gold, and very high in copper. It is the best prospect we have seen in many a day, and were it in Arizona, Sonora, Mexico, Siberia, Alaska, or a like God-forsaken oountry, Sau Francisco and Eastern capitalists would outbid each other to obtain possession of so promising a piece of mining property; hut the Uncle Billy is in one of God's favored countries, where the snow-fall ie light and would never retard mining operations or prevent free access to the works during the most inclement winters; where there are eligible eites for all the necessary reduction works, and for a town, and where wood and water, and all the necessaries of life—for man or beast—can be had in the greatest ahundance, and it may not attract the attention of capitalists until its greater development places it among the valuahle minee of the conntry. The work is being done hy C. W. Honeycutt and T. J. Baker, who recently returned from Arizona and Sonora, they having taken an interest in the mine, having great faith in ite prospective value, the other principal owners heing William and Henry Rickey and Geo. Chichester, all of Antelope valley. A number of locations have been made on the Uncle Billy ledge, and a parallel ledge, known to he the extension of the Walker river copper mines, which are being successfully worked, has also been taken up hy the Antelopers. It is notorious that the entire section is fnll of mineral—silver and copper, and we advise our prospectors to visit that section. The mines are just over the State line, in Douglass county, Nevada, and a natural road runs through the canyon from Antelope to Williams' on the Sweetweter road, but the natural depot for supplies will he Antelope valley, and the people of that favored valley—the garden spot of Mono—should all take stock in the Uncle Billy and assist in its development, for there is a splendid prospect for a good mine, and the people of Antelope will receive the greatest benefit from it.

New Dams in El Dorado.—The dams being constructed hy the Cal. W. & M. Co. at Loon Leke are composed of granite, and tbe works are of a character to do service for ages. The company are certainly making all of their improvements of a suhetantial and lasting nature. The winter following the present company's pnrchase of this promising property was one of the eeverest ever experieuced by ditch owners in the mountains of California, and the manager, Mr. Findley, in common with the leading men of the company, has determined that euch a disaster shall never visit their property again, and further, they are building the dams of such dimensione as to increase the water reserve sufficient for all future wants of this divide and the city of Sacramento besides, which the company may have the opportunity of supplying in the near future. The object of these immense reservoirs located at an altitude of more than 6,000 ft. above the eea, is to store an abundance of water from the vast accumulations of snow, as a reserve for the dryer portion of the seeson, when the supply from other streams begin to fail. The course being pursued by the management appears to us a judicious one, and there is nothing to prevent, with honeet management, this becoming a handsome dividend paying property in the near future. In a few weeks we will try and procure a statement of the progress made by the company since the property fell into their hends. —*Georgetown Gazette.*

Very few people have any idea of the space required for the storage of the money now in the hande of the Sub-Treasurer. The basement vault ie about 17x35 ft., and 9 ft. high. Thie ie full. There are two vaulte on the main floor, about 8x8 ft. and 10 ft. in the clear, and these are nearly full. There is probably room for only $1,000,000 more etandard dollare. You can etore $20,000,000 in gold in the place of $1,000,000 in eilver. There is 490 tons silver now on deposit there, mostly in etandard dollare, a portion ef which is repreeented by the eilver certificatee in circulation. Silver coins that have been in circulation show a loss by abraeiou, ae compared with new coin, of $13 in every $1,000. Congress hae made no provieion for redeeming abraded eilver coin.

Herr Krupp, the great German gun-maker, is eo preseed with orders that he has engaged 8,000 more workmen, making the total force of workmen 13,000.

Gold Park Mines.

M. San Pedro, manager, writes to the Grantsville *Bonanza* as followe, about the Gold Park mines, Nevada:

Last week we struck very rich ore in the Star of the West tunnel. We have heen running a drift in the Star of the West tunnel for some time; it is now 100 ft. eouth from the tunnel, shnwing all along fine carhonates two and one-half ft. wide, averaging ahout $100 in gold, $40 in silver, and from 18 to 20% in lead. At this point, over 100 ft. south from tunnel and over 100 ft. to the eurface, both mines, Nos. 1 and 2, come together, and the ledge is now over three ft. wide. Here we have connected with incline of No. 1 Star. Keeping the drift to the south, on the ledge and just under the incline, at 100 ft. from the surface, have started a winze, and from the level of the tunnel dowu the mine is showing galeua with carhonates rich in gold. An average assay from this place, made by Mr. T. Price, of San Francisco, gave the following results: Carbonates—$158 in gold, $33 in silver and 19% in lead. Galena—$4 in gold, $171 in silver, and 68½% in lead. Of these ores we have over 100 tons in dump, taken out simply in running this drift. Since this new strike of smelting ores I have brought all my men from the Arctic series, which mines are of free milling ores very extensive and rich in gold. Of these I will write some other time; but I see more money in the smelting ore of the Star of the West series for the present, so I bave brought all my men, 12 in number, to the new bonanza, our object heing to find its extent.

It looks very etrange to see in this formation, viz., porphyry and syenite away from the contact of lime, for these mines to produce emelting ores of the highest degree. I confess the truth, in all my experience all over South America, and here in the United States, I have never seen a case like this; hut this may be another wonder in the mineral world.

Now, Mr. Editor, I see you have done justice, through your paper, to this promising distriot, aud also stopped some growlers, who were uttering words of discouragement ahout Gold Park mines. Let them growl! Bsfore long nature will make them retract their own words with remorse.

Cheese and Rheumatism.

The results of my observation and expsrience of the ill effects of cheese, particularly when taken in laige quantities, may he intersstiug to some readers. My attention was first directed to this snhject in 1871, through reading a pamphlet in which the writer, a medical man, stated having observed that large numhers of persons in certain localities suffered mnch from rheumatism, chiefly in the limbs. On inquiry he found that cheose entered largely into their bill of fare, and subsequent ohservations led him to the conclusion that it was to a large extent the cause of their pains. Being fond of experiment, I put the matter to a test, as I remembered having suffered similarly eome years previously, and at a time when I had heen taking cheese. I commenced with a supper of hread and cheese, and after a week or ten days, as near as I can remember, I experienced pains in the limhs similar to those caused by having wet feet. The pains were chiefly confined to the thighs, and were continuous when moving ahout during tbe day, though not experienced when lying in hed. Some yeare afterwards, when eerviug in a grocery store, a young man half my age (I was 40) complained to me of pains in the limhs, with an indisposition to exertion. I at once told him if he would let cheese alone he would he all right. He followed my advice, and experienced in a few daye en entire cessation of pain. He again and again returned to the practice, but always with the same resnlts. Having been lately again indulging too freely in the use of cheese, again the results ahove given followed, and I have just recovered hy ahstinence from cheese. I find that I can digest haked or toasted cheese hetter than raw, and can eat more of it. Can any medical friend give us the *rationale* of this eubject?—*Herald of Health.*

Construction of Mining Law.—The Commissioner of the General Land Office puts the following construction upon Section 2,336, U. S. Statutes, "where two or more veins," etc.: The uniform construction placed upon this section is, that the epace of intersection meant, is determined solely hy the width of the intersecting veins, and not by the width of the claims. For instance, the party making the first location is entitled to all surface ground and the full extent of the vein included within the boundaries, inclnding the space of intersection. The second locator is entitled to the full length of his location, exclusive of the conflicting surface ground, and the epace of intersection of veins. If the intersecting veine are respectively 10 ft. in width, the epace of intersection would he 10 ft. square and the party locating last would not be entitled under the law to 10 ft. of lode included in the space of intereection.

Magnificent Assays.—The Safford district is ehowing better with every etrike of the pick. Eight assaye from the Onondaga mine, made by C. Wiegand & Co., of Virginia City, resulted as follows: No. 1, $160; No. 2, $366; No. 3, $160; No. 4, $576; No. 5, $184.40; No. 6, $91.20; No. 7, $167.20; No. 8, $294.40. The proprietors now claim to have eix ft. of this high-grade ore. —*Eureka Sentinel.*

Charles Dickens Bullion.

August 19th, received from the Charlss Dickens mine, per Pacific express company, at Challis, four bars bullion, weighing 124 lbs., value $3,000. This rich and immense mine is constantly sending out her treasurss to the world. We have intended to publish her shipments regularly, hut one accident and then another caussd the omission. We have no pet mines, and if we had, most certainly one of the grandest and best in this or any other portion of the world would be one of them. We shall he glad at all times to encourage the working, development and financial success of each and every true mine. We do not want to know of, or hear of, "wild cets." They damn a country, and help only knaves—for only knaves would profit by the criminal management of them. Swindlers, managing in a swindling manner, mines, have done more to make the capital of the world coy than ever weak mines did. Mining is a legitimate business, and, honestly and honorably conducted, we have a proud and almost limitless field in which capital can operate. But in all the veins and placers where we have ever heen—in California, Oregon, Nevada and Idaho—we rarely, if ever, saw a mine, with so little development in it, and so little machinery attached to it, that gave such proud promise and euch ahundant production as the Charles Dickens. It might well be named by its discoverer, William Norton, after one of the greatest of men.—*Challis (Idaho) Messenger.*

Misrepresented.—It was currently rumored on the streets Wednesday, that a collusion had been entered into betwesn the Miocene, the Gold Run, and tbe hydraulic mining companies that have not bsen enjoined, hy which the two former companies were to delay the suits against them now pending in tbe courts, for which they were each to receive $20,000 per month from the other companies, who continued working. A reporter called on Major McLaughlin, who denied the rumor in toto, stating that tho Miocene company was doing everything possible to bring the case to a speedy trial and have the question settled; that a large amount of money had been invested in the property, and they wanted a decision hy the courts as to whether they were or were not to be permitted to develop it and get some return on the investment; that $15,000 or $20,000 a month would not compensate them for delaying the suits. The Major also said that among other misrepresentations circulated about the Miocene company, was one to the effect that they had been running 3,000 inches of water into the river, and that they had 1,500 acres of land for hydraulicing purposes. The fact is that up to within a week of the time they were enjoined, they were unable to run even 1,000 inches of water, and during the last few daye that they worked, they only managed to run ahout 2,000 inches; and all the land they hold for hydraulicing purposes does not exceed 500 acres.—*Oroville Mercury.*

Death from the use of Anti-Fat.—Much excitement has been caused in northern Ohio over the recent death of the wife of C. R. Griggs, lessee of the Wheeling and Lake Erie railroad, cansed by using the medicine known as "anti-fat." The following are given as the facts of tbe case:—On the 11th of Angust Mr. Griggs and his wife engaged a suit of rooms at a hotel, both being, apparently, in perfect health. On the morning of the 13th a servant, entering her room, found her lying in a swoon on the floor. A doctor was summoned, but all his efforts to bring her out of the comatose state into which she had fallen were fruitless for a long time. Mr. Griggs finally telegraphed for Dr. Soss, of New York, the family physician. For awhile both doctors were puzzled, and pronounced the case one of erysipelas. Mrs. Griggs was very etout, and Dr. Soss, learning that she had heen taking an anti-fat medicine, hegan treating her for hlood poisoning. In her lucid moments she told Dr. Soss she had taken 18 bottles of the anti-fat medicine in ten months. Recently she became ill and had discontinued its use. Once bsfore Mrs. Griggs was taken sick after using this medicine, and the doctor, after great trouble, succeeded in giving her relief. He told her that the continued use of the medicine would certainly canse death, and supposed she had stopped using it. The combined efforts of both physicians to save Mrs. Griggs' life were of no avail.

A New Theory of the Cementation Process.—Mr. R. Sydney Marsden has brought forward, at a meeting of the Chemical Society, what he claims to be a new theory of the cementation procese for the conversion of wrought iron into steel. He hae observed that when amorphous carhon in an impalpable powder is kept in contact with porcelain at a temperature conaiderably above rednees, but not sufficient for the latter to become fused, the carbone will, if left for a number of hours, diffuse into the porcelain and ultimately permeate it throughout. He considers the conversion of wrought iron into steel by the cementation process as analogous to this—that is to eay, the result of diffusion of carbon in an impalpable powder into the bars of iron while they are in an expanded or softened state.

Mr. Wm. B. Hyde, Superintendent of the Custer mine, Idaho, has honded the North and South America mines in the Yellow Jacket district, and has sent a party of men over to work them.

A Pleasure Trip.

Just at this season of tbo year ono of the finest and most agreeablo trips to he made in the State is that offered by the counties of Napa, Lake and Mendocino. Taking the Vallejo route, go to Napa and Calistoga by rail; from there by stage to auy or all of the following springs: Anderson, Adams, Siegler or Highland; then to Soda Bay; theuce hy boat on Clear lake to Lakepor; by stage to Wilter and Piersen's springs; a day or two at Blue lakes; stage to Ukiah, and then to Mendocino through the far-famed redwood region; visit the mill at this place, where they daily turn out 50,000 ft. of lumher; thence hy the Pacific Coast steamship line to San Francisco. We know of no round trip that will give one a better knowledge of the Coast range than this, which is full of picturesque scenery from heginning to end; good hunting and fishing anywhere along; dotted every few miles with medicinal springs, affording good stopping places at almost any epscified distance so that ono may lay over in comfort when weary. Soda Bay is a wonder of nature; Blue lakes are beautiful, cosy and health-inspiring, with fine fishing, hunting, hoating, and the finest well of water in the State. The ride from Ukiah to Mendocino is all the way through dense redwoods, here and there deer jumping out of the way of the stage; huckleherries lining the road, and occasional glimpses of the vastness of the forest, and beyond the deep, placid, rolling Pacific, had from the summit of eome bare peak around which the road winds. At Mendocino one may cruise up and down the river trolliug for salmon, whipping for tront, wandering into the solitude for a deer, or gathering shells on the heach. Such a trip gives spice and variety to life, and adds to ono's knowledge of tho resources and beauties of our State.

Died With Their Boots On.—The names on most of the head-boards of the men who died with their boots on, and were huried at the lower end of town, have been obliterated hy the weather, and those warriors, the mentioning of whose names always bring to memory the early and prospsrous days of Pioohe, when mining companies maintained young armiee and the minere went to their lahor with 16-shooters on their shoulders, aud we used to have lots of nice big funerals, with banners flying and music playiug, now sleep in unmarked graves in the City of the Dsad. The heed-hoard at the grave of Jack Harris, the noted stage-rohher and road agent who Wells, Fargo & Co. paid $250 per month to keep off of tho road, has escaped the inclemency of the weather and the lettering appears as perfect as that on hoards placed at the head of graves hut a few short months ago.—*Pioche Record.*

The Idaho *Statesman* wants to know how is is that no company has heen organized to work the hars on Boise river, hetween that city and the old ford 12 miles above. All the tributaries of that etream above here have paid enormously, and men aro now living in three-story houses in San Francisco and Oakland, who came into Boise basin afoot and lived on sowhelly and heaus. These hars ought to he as rich as those on Snake river above the American falls, and wherever proper machinery can be had to save the fine gold that has heen lodging there for the past 18 yeare, they will pay enormously. If rocker mining helow Umatilla, on the Columhia, will pay $1.30 to the hand, the hsrs along the Boise ought to pay three times as well.

Spring City Notes.—A note from Spring City, in the *Silver State*, eays: "The town is unusually quiet, and money scerce. Two of the principal mines being bonded to outside perties, work on them is suspended for the present. The mines are in splendid condition for producing ore, of which there are several tons in sight. The Red Deer mine is showing up well. A shaft is heing eunk on the vein in the tunnel, and the ledge is large and liahle at any time to opsn out into a honanza. Tho Big Nick and Live Yankee, in the vicinity of the Bullion, are good prospects, and it is to he regretted that some compauy with means to develop tbem dose not take hold of them."

The Angular Distance of Color.—The determination of the angular distauce of colors, whatever that may be, was made the subject of a paper submitted to the Academy of Sciences of Paris, on July 25th, by M. Rosenstiehl. The colors—orange, yellow-green and blue—have the characters of a triad or of producing the visual eensation of white when mixed with equal intensity. All the colors which occupy the angles of an inecribed equilateral triangle have the same properties.

Pennsylvania District.—A. J. Blair, Superintendent of the Hillside, and Jas. R. Duff, Superintendent of the Meadow Valley mine, paid Pennsylvania District a visit the other day. It is a well-known fact that there are eome very promising mining property in that district, and we would not be astonished to hear of a little prospecting being done on some of the claime.

M. C. Taylor ie developing a fine ledge of iron ore below the Lime Kiln, 18 milee south of Grass Valley. Copper is also found in large quantities, commingled with iron.

The Engineer.

Engineering Enterprise.

The present century will be prominent in the annals of engineering. The world seems smitten with a craze for piercing isthmuses, boring tunnels, constructing bridges and kindred undertakings. At home, our hands are full of such schemes; but the people of the Old World appear to be especially under the spell. The Alps are being pierced by tunnels under the St. Gothard and the Simplon, while designs are made for burrowing the base of the mighty Mount Blanc himself. What is known as the Chanel tunnel, between England and France, is, so report says, progressing favorably; and the same spirit of enterprise, which, goaded on by the brilliant success of the Suez canal, is scratching the Isthmus of Panama, is also persuading engineers of the expediency of opening a new entrance to the Mediterranean, now entirely monopolized by Gibraltar's strait, by means of a waterway from Bordeaux to Narboune, at each of which porte there is an excellent harborage for vessels of every description.

Those who do not carry a map of the world in their heads may see by a glance at a chart of Europe that there are benefits likely to accrue to France and other European nations by carrying out this scheme, and that there are also the reverse in the event of a general struggle throughout Europe. The fact, too, that the Garonne may, with comparatively little expenditure, be made navigable as far as Toulouse—two-thirds of the distance of the proposed canal—divests the scheme of no inconsiderable amount of its weightiness.

Much of the opposition to these projects is needless; but it would be a wonderful venture indeed that was hailed with unalloyed enthusiasm. Perhaps no undertaking was ever more bitterly opposed at its inception than the Suez canal; and those who showed themselves most hostile to that enterprise lost no time in acquiring nine-tenths of its stock as soon as the speculation proved profitable.—*Cincinnati Commercial.*

Testing the Hudson River Tunnel.—A test of the strength and soundness of the completed portion of the Hudson River tunnel was recently made. The new air locks at the river ends of the borings were closed and the air pressure was gradually reduced in the portion between the locks and the shore. The test was satisfactorily borne, except by the unfinished part between the locks and the heading, about 30 ft. in length. The escape of air from this portion by leakage allowed the silt to press in, crushing several feet of the iron shell which extended beyond the brickwork. The workmen had been withdrawn from this part of the tunnel before the pressure was reduced, and, except for the derangement of the extremity of the tunnel next the heading, and the pressing in of silt, no harm was done. This difficult engineering work is still progressing successfully, notwithstanding the opinion of numerous engineers that the method employed of preventing the admission of water by keeping the excavation filled with compressed air was not practicable. Since the disastrous accident some months ago, resulting in the breaking of the air lock and the flooding of the tunnel, causing the lose of many lives, there has been no further trouble with the work. Both the tunnel ways are being pushed simultaneously, and it seems very certain that ere long railway trains can be run from Jersey City directly to New York.

Improving Charleston Harbor.—Government engineers are at work endeavoring to improve the harbor of Charleston in the same manner as the mouth of the Mississippi was deepened—by jetties. This work is proceeding with commendable energy. On July 1st the foundation for the jetty on the north side of the harbor had been carried ont 12,000 ft. from Sullivan's island, and during July about 600 ft. more were completed. Some 5,000 ft. must yet be added before the foundation of the north wing of the jetty is completed. The foundation of the south jetty has been run ont 6,000 ft. from Morrie island, and it must be extended 12,000 ft. farther. Capt. Green, who ie in charge of the works, thinke it can be completed within 18 months. The jettiee so far have made no appreciable changes in currents of the harbor or the depths of the water.

The Arlberg Tunnel.—The boring of the Arlberg tunnel is proceeding with great rapidity. The length finished since June, 1880, is 1,720 meters, and an average yearly advance of 2,160 meters is confidently expected after a while. The avorage of Mont Cenis and the St. Gothard wae only 1,112 and 1,670 respectively. The St. Gothard tunnel will be completed by the end of Septemher, but the lines of approach are not likely to be ready before next spring.

A Ship Canal across the peninsula of Maryland and Delaware, shortening the distance hy water from Baltimore to the Atlantic, ie an old project; but now it is to be speedily carried out, the necessary $8,000,000 having heen raised.

Eucalyptus Leaves for Tobacco.—A Paris manufacturer claims to have discovered a process for substituting the leaves of the eucalyptus tree, which in burning emit n delicious perfume, for tobacco leaves in making cigars.

Useful Information.

Composite Portraits.

A composite portrait is something new in the art line. At the last meeting ot the Photographic Society of Great Britain, Mr. Francis Galton, F.R.S., read a paper on "Composite Portraiture," in which he stated that his attention was first directed to the subject some years ago, when he found that, by taking two or more portraits of different individuals under exactly the same conditions, and superimposing them, the features, if not absolutely dissimilar, blended together and formed an idealized portrait, which could be well seen when the image was thrown upon a magic lantern screen. The registor he adopted, so that the features should be identically superimposed, was by drawing a horizontal line through the eyes, another parallel to this through the mouth, and a third, perpendicular to and bisecting these horizontal lines through the nose. The point of bisection between the eyes was that which he was especially careful to maintain in the same position in each portrait. Mr. Galton's first method of producing composite portraits was hy means of a copying camera, paper positives being used. He now, however, used transparancies, and he exhibited and described the apparatus which he had adopted for the purpose.

One purpose for which he believed composite portraits would he valuable was that of producing a standard physiognomy of disease. With this object he had taken the portraits of consumptive persons, male and female, and had combined them; and it was remarkable how a certain average of faces was found to be almost identical. Mr. Galton also exhibited a number of what he called typical portraits. One was the face of an idealized criminal formed from a combination of seven portraits of criminals, others were the faces of consumptive patients, and a third series was that of the portraits of officers and men of the Royal Engineers. In one case he had combined the portraits of twelve officers, in another the portraits of eleven privates, and in a third he had combined the portraits of officers and privates. In each instance Mr. Galton said the individuality marking each class was strongly brought out and idealized. He also pointed out how, in every cass, the idealized portrait was better looking than the faces from which it was made.

To Extract Oil from Herbs.—The volatile oils are generally obtained by distilling in a deep narrow retort the articles along with an equal weight of water: but some substances that give out their oil with difficulty are first soaked for twenty-four hours in twice their weight of water, to each gallon of which one pound of common salt has been added, by which its boiling point is raised, and consequently the oil comes over more readily. The distillate sepsrates into two layers, the water being drawn off and returned to the retort, and this is repeated until distilled water ceases to come over mixed with oil. The rectification of the oil is performed without water, by the careful application of heat, just sufficient to cause them to flow over pretty rapidly, so that they may he kept heated for as short a time as possible.—*Scientific American.*

Facts Convenient to Know.—The following facts are well worth remembering, as they will save a great deal of calculation and give approximately accurate results with minimum labor:

A cord of stone, 3 hushels of lime and a cubic yard of sand will lay 100 cubic feet of wall.

Five courses of brick will lay 1 foot in height on a chimney. Nine hricks in a course will make a flue 8 inches wide and 20 inches long, and 8 bricks in a course will make a flue 8 inches wide and 16 inches long.

Eight bushels of good lime, 16 bushels of sand and 1 hushel of hair will make enough mortar to plaster 100 square yards.

One-fifth more siding and flooring is needed than the number of square feet of surface to be covered, because of the lap in the siding and matching of the floor.

One thousand laths will cover 70 yards of surface, and 11 pounds of lath nails will nail them on.

One thousand shingles laid 4 inches to the weather will cover 100 square feet of surface, and 5 pounds of shingle nails will fasten them on.

Matrimony Tart.—Pare and core a dozen apples; put them into a saucepan with a little water to keep them from burning; boil them until you can pulp them, but do not forget to frequently stir them; then add quarter pound of currants, two ounces of candied lemon peel, and enough sugar to sweeten it nicely; if liked, also a little grated nutmeg. Pour this mixture into a large dish that has previously been lined with a thin paste. Then roll out another piece the same size and thickness, which place over the top; press the edges together all round, make a hole in the center the same as for mince pies, and hake.

The Best Oil for Rubber Belts.—A correspondent of a mechanical paper says: "I have run many rubber belts, and after trying various articles had the best success with hoiled linseed oil. It should be put on while the belt is runing slow, say at night or stopping-time, and run slow long enough to distribute it well. All animal oils are very injurious for rubber belts, causing them to 'peel up' and leave the fahric hare."

Tanning of Sealskins.—The *Shoe and Leather Reporter* furnishes the following interesting item in reference to the method of tanning sealskins and the use to which the leather is put: The tanning of sealskins taken from the hair seal, captured on the northeastern coast of North America, is carried on to a large extent in Great Britain and France. They are made into a pebbled or grained upper, similar in appearance to coarse morocco, or into varnished leather. The skin of the seal is light, but of a close texture, and when properly tanned yields a very tough leather. In Europe it is made up into ladies' shoes. The rough-haired or "bluebuck" sealskins are the kind used. The tauning and finishing process for these skins requires six weeks' time. The process is similar to that used for making morocco leather. They are soaked, the grease taken out, fleshed, limed, unhaired, then split, bated and tanned in equal quantities of sumac and oak bark. Some forty years ago a large business was done in this country in tanning sealskins, but although the raw material is obtained on our coast, the industry is not at present pursued here. The catch is mostly around the coast of Newfoundland, and this season it has been very large, amounting to 455,813 seals. They are caught for their skins and oil. The local value of the animal is about $2 to $2.50 each, and they weigh, on an average, 50 pounds. The skins sell in London for 50 to 75 cents apiece. The leather made from them averages about 75 to 100 feet to the dozen skins. Many years ago these skins were used in this country for coverings for hair trunks and splits for carriage-makers. An imitation called "seal grain" is now rather fasionable, and a business might be built up and become profitable in tanning the real article for shoe-manufacturers' uses, as is done in Europe.

Rail-Testing in Germany.—The German Railway Union has agreed upon certain specifications to be satisfied in the steel rails they use. The tests to be made in the works are these: A rail placed upon supports 3 feet 4 inches apart must bear a load of 20 tons for several hours without permanent flexure. In like position it must bear without breaking two strokes of the monkey of a pile-driver a weight of 1100 pounds falling 13 feet, and without any injury a falling of the monkey 5 feet. The rail must be capable of being bent in the cold state, either way to the extent of 2 inches without showing cracks or fissures. It must further be capable of bearing a curvature of 9-10 of 1 inch in 9 feet and 10 inches.

Silver in the Arts.—A circular has been prepared by the Mint Bureau for the purpose of ascertaining the amount of gold and silver used in manufactures and the arts in the United States during the last fiscal year. It will he forwarded by mail to manufacturers, with a request that they fill up a blank form which will he inclosed, calling for the amount of United States coins melted and worked up, fine bars used, and foreign coin, dust and old manufactured articles made into new work. Nearly 3000 answers were received from persons addressed with a similar object in view last year, which showed that there had been an aggregate of $12,198,363 in gold and silver used in the manner indicated during the fiscal year 1880.

Good Health.

Diphtheria.

Editors Press:—As the cold and stormy season of winter is now upon us, mothers commence housing the feehle, delicate little ones under their charge. But let me ask, would it not he far wiser to send them out for a while at least every day into the pure air? Investigate most thoroughly every part of your dwelling. See for yonrself that the cellar is well ventilated, that there are no decaying vegetahles ahout it, that it is perfectly dry and healthy. The walls should be whitewashed and disinfectants scattered over the floor. Chloride of lime is the cheapest and hest for this purpose. If water closets are in the house they ehould he carefully examined hy an honest and reliable plumber. Stationary washstands ought also to he looked to, and the traps put in perfect order. A small quantity of enlphate of iron dissolved in two gallons of hoiling water should he thrown into the closets and wash basins at least twice a week. Allow no withered flowere to etand, for the water hecomes dead, and the decaying etems produce a malaria in the air, which, to a delicate pereon, provee extremely hurtful.

With these precautions and the little ones put upon a hea'thful nutritione diet, many untimely deaths may he prevented. Many persons think that diphtheria ie comparatively a new disease. On the contrary, it is known to have been prevalent in Egypt over 2,000 yeare ago. It appeared in Rome A. D. 334, was highly contagious, and was called the Egyptian nlcere, appearing in all casee in the throat.

When the first symptoms of soreness in the throat are noticed, itis well to gargle the throat with water, not too cold, and with a little salt dissolved in it, making it slightly hrackieh, like sea water. See that the stomach and howels of the patient are in good order, and then send for the family physician as soon as poseihle. One reason why so many cases are fatal, is that there is oftentimes a delay of a few hours, and the disease obtsins a powerful hold upon the patient, when a slight remedy administered in season might have arrested its progress. Here comes in full force tho old adage, "An ounce of prevention is worth a pound of cure."

It is doubted by some whether diphtheria is contagious. I will cite an instance. A lady living in San Francisco lost a little girl with the disease. The year following she visited friends in Boston, and a few days after her arrival their little child died with the disease. A. C. A.

Berkeley, Cal.

Tomatoes as Food.

Tomatoes, remarks an authority, are not without some defects as an article of food. They are not, like milk, a perfect diet of themselves, and besides, like most other articles of food, they contain some obnoxious qualities. But they need not be throwu aside on that account. Nature has provided us with such sufficient excretory orgaus that obnoxious matter in our food, if in moderate amount, is readily cast out, and the body is protected against any material injury. Were it not so, we should he obliged to throw out of our dietary many kinds of food now eaten, not only with impunity, but with advantage. Thus, red cahhage, cherries and peaches contain prussic acid, which is a deadly poison when taken in sufficient quantity. The very small amount of the poisoning acid these vegetables contain is cast ont of the system without any material injury to the person using them. A positive good may actually he derived from the use of food containing some such foreign matter, hy way of giving increased activity and strength to the excretory organs from their exercise in casting such foreign matter from our bodies, provided the quantity is not so great as to overburden them. Since we are all the time liable to take in our food substances the tendency of which is harmful, a good development of efficiency in our excretory organs is necessary to protect us against the pernicious effects which might otherwise occur. Almost every kiad of grain and fruit in use contsin more or less things which in a larger amount would prove hurtful. Unless we closely study our food, we are taking them in when we little suspect it. A Frenchman, not many years ago, discovered a substance in wheat hran, under which the high heat used in baking, dissolved out and spread over the crumbs of bread, of which bran forms a part, and discolored it, and hence the brown stain peculiar to graham bread. But from this discovery such bread hae not been rejected, hut continues to he accounted among the most wholesome kinds of food. Rye is seldom used without containing more or lese ergot, hut rye bread ie aleo reckoned among the most healthful. Tea contains tannic acid, apples contain malic acid, lemons and oranges citric acid, no one of which is used either in nutrition or reepiration, hut they only become objectionable when used excessively. —*Leeds Mercury.*

Howard's Method of Artificial Respiration.

We think it advisable at this season, says the *Canadian Journal of Medical Science*, to direct attention to the following rules for resuscitating the partially drowned:

1. *Instantly* turn patient downward, with a large, firm roll of clothing under stomach and chest. Place one of his arme under his forehead, eo as to keep his mouth off the ground. Press with all your weight two or three times, for four or five seconds each time, upon patient'e hack, so that the water is pressed out of lungs and etomach, and drains freely out of mouth. Then,

2. *Quickly* turn patient, face upward, with roll of clothing under back, juet below ehoulder blades, and make the head hang back as low as possihle. Place patient'e hands ahove his head. Kneel with patient's hips hetween your knees, and fix your elhows firmly against your hips. Now, grasping lower part of patient's naked chest, squeeze his two sides together, *gradually* forward with all your weight, for about three seconds, until your mouth ie nearly over mouth of patient; then, with a push, *suddenly* jerk yourself hack. Rest about three seconds; then hegin again, repeating these hellows-hlowing movements with perfect regularity, so that foul air may he pressed out and pure air be drawn into lunge, ahout eight or ten times a minute, for at least an hour, or until the patient hreathes naturally.

Eating.—The mejority of mankind neither know how to eat nor what to eat. Persone should allow themselves sufficient time to masticate their food well, and not force tho stomach to perform the double work of chewing and digesting. As to quantity and quality, everyone ehould make hie own selection. More harm is ueually done by too much and too great a variety than by richness in quality. No general rule can he laid down; each etomach indicates ite own adaptations and preferences, and its own fullness; and if the eater will mark well the monitione of thie faithful thermometer, he will soon he able to regulate his diet better than any phyeician or strolling quack, who professedly announces either through puhlic or private lectures.

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Passing Events.

The feature of the week in mining circles has been the sudden excitement in the stock market, based on a suppositions "strike" in Sierra Nevada. Our stock tables show what it amounted to in the way of varying prices. It brought to the front a lot of stock dealers who have been out of sight for a long time.

The Indian disturbances in Arizona are creating a good deal of discussion, and it is likely the occasion will be seized upon to urge some better system of managing the Indians than that now in vogue.

Already signs of winter are beginning to show themselves. Snow has appeared up in the Sawtooth range, Idaho and also in Utah. It will not be long before prospectors will have to hunt for their cabins and lay up for the winter. Then they will begin to think California, Arizona and New Mexico are good enough countries for a while.

President Garfield seems to be improving somewhat since his removal to Long Branch, but his recovery is by no means certain as yet.

Local mining news from various quarters seems to be encouraging. From many points we hear of strikes, and nearly everywhere the work of development is proceeding with energy.

CORRECTION.—In the last issue of the PRESS, in the article by Mr. Aaron, for "Wm. S. Key," read "Wm. Skey." For "iron, steel, sulphur," etc., read "iron, zinc, sulphur," etc.

Slimes and Tailings.

The term "slimes" applies to that portion of the crushed ore which is reduced by the stamps to an exceedingly fine condition, and, flowing from the batteries in the stream of running water, does not find sufficient opportunity to deposit itself in the tanks in which the coarser sands are collected, but is carried beyond them, and only settled, after a long time, either in another set of tanks or in large reservoirs. These are properly called "battery slimes," to distinguish them from the material that may be reduced to a similarly fine condition by the operation of the pan.

The term "tailings," in milling, is understood to apply to that portion of the crushed ore, which, after having been subject to the grinding and amalgamating process in the pan and settler, flows away from the latter, or from the agitator, and passes on out of the mill, deprived of the greater part of its valuable contents. A part of this material is in a very fine and slimy condition, but the bulk of it may be better described as a fine-grained sand.

Leaving the mill, the stream flows onward and is usually subjected at once to various methods of concentration, the most common of which is the blanket table, by which means a portion of the escaping amalgam, quicksilver and heavier particles of ore may be extracted to be reworked, while the great mass of material is finally collected in dams or reservoirs for still further treatment. Reservoirs for this purpose are placed at convenient points along the corner of the streams or canyons on which the mills are usually placed. In these reservoirs everything brought down by the streams finds a resting place, and is reserved for work in the tailings mill.

Mr. James D. Hague, in a chapter on this subject in Clarence King's "Mining Industry," describes the whole mode of working both the slimes and tailings, the method of concentration and treatment of raw tailings.

He shows the quantity of slimes produced in crushing ore varies considerably in different mills. Some mills on the Comstock, the preparation of slimes was thought to be almost 2% of the ore crushed by the stamps, while in others it was as high as 10%. This is partly due to the difference in the conditions under which the crushing takes place.

As these slimes carry with them much of the very finely crushed silver ore, their assay value is not only considerably higher than that of common tailings but often higher than that of the original ore. Especially that portion of the silver bearing mineral of the ore which exists in the form of rich sulphurets, being soft and readily crushed, is liable to be reduced to an impalpably fine condition, particularly if freed from particles of quartz that might, if present, preserve it in a coarser form, and escape with it from the battery before being reduced to slime.

The Indian Troubles in Arizona.

While it was found that the first news of the massacre of Carr's command was greatly exaggerated, it has served to call the attention of the whole country to the Indian question again. And this time, judging from the tone of the press, the policy of turning the Indians over to the War Department is still more strongly urged than ever before. The miserable policy of our Government toward the Indians has inspired them with a contempt for our people and our soldiers, and it is not only difficult to keep them on their reservations, but to keep them in any kind of order. The rascality of Government agents and Indian contractors has bred dissensions, and these men, of course, are desirous of keeping affairs just as they are.

The breaking out of the Indians in Arizona will do the Territory more or less harm of course, and more particularly its mining interests. But this will only be temporary, since now the country is settled up to some extent, a wild horde of savages will not be allowed to ride rough shod over the people. If the Government does not adopt reform measures the citizens will, and when that time comes the Apaches had better hunt their holes. Of course a good Indian fighter with suitable troops, and left free from entangling and embarrassing directions from Washington, could settle the question with the Indians in short order. The thing is, will such a man be sent there and allowed to carry on the campaign in his own way. We see that the citizens in one of the large cities have held a mass meeting and petitioned Government to remove the Apaches to the Indian Territory.

Gov. Fremont, of Arizona, has suggested to the Interior Department, apropos of Apache troubles, that the United States unite with Mexico to use a portion of the upper part of Lower California as a place of exile for all troublesome Indians. Mexico, he suggests, is equally interested with the United States in sequestering the Indians of the border, and would unite with us in executing the scheme. The Pacific ocean, the Gulf of California, and a chain of forts on the isthmus, would hem them in. Then peace would prevail throughout the West.

There is one thing about this plan. It means, practically, extermination without the trouble of exterminating. The Indians would starve for want of food and water, for it will be hard to find a more God-forsaken country than the peninsula of Lower California.

Mining Boats for River Work.

In last week's PRESS, we gave some observations on Georgia gold mines, and the proposed method of working the river beds by means of vacuum dredging boats. It seems almost too bad to throw any cold water on such plausible schemes, but we venture to say the vacuum mining boats will get more water than gold. If freight was not so high between here and Georgia, they might get mining boats cheaper than building them. There are a dozen or so here, which could be bought for a song, taken to pieces and shipped.

The Boston company which was to build dredging boats for working those Georgia rivers, is perfectly informed of the failure of the process here, as they wrote here for information. So it is probably a scheme to sell stock, more than anything else. The California rivers are probably as rich as those of Georgia, and as large nuggets lie hidden here as there; but of all the mining boats, vacuum dredges, etc., built here for working river beds, not a single one ever yet got enough gold to pay for itself. Many difficulties present themselves when practical work is begun. The vacuum dredges bring up dirt and rocks, but little gold, in places where gold is known to be comparatively plentiful. Why this is so seems strange, but it is none the less a fact. Several hundred people in this city who have put money into these mining boat experiments, can testify to the utter worthlessness of such appliances. Miners all along the river can also give their experience. Still every few years some new crowd comes along and starts in, entirely ignoring the experience of others before them. When they are told of it they say they have a new and better system, and know how to do it better, or have better ground.

But they have all failed, not only on the rivers, but wherever they have tried to pump up golden sands. On the sea beaches of our northern coast-line, where the sands are auriferous, samples of sand outside the surf line showed fine gold in quantities to pay, but schooners fitted up with powerful steam pumps, vacuum arrangements, etc., all proved failures. In fact, we do not remember a single instance of success in this kind of mining.

It is to be noticed, in the reference to the Georgia gold fields, before spoken of that they know there is gold on the river bottoms, but that the vacuum boats are *being built*. No work has been done with them there yet. There is a strong probability that their experience in Georgia will tally with ours here, when they get at work. No process of mining looks better theoretically than river-bed mining with vacuum dredgers. There is plenty of water, lots of river bottom, steam power will do the work of men, and all you have to do is to get the mud up and pass it through sluices, etc., catching the gold. But you don't catch the gold. Theoretically you do, but practically you don't. When the Georgia people get through experimenting with their river boats, and make a success of any one of them, they can come out here to California and make money out of the secret. There are a number of rivers here which have gold in their beds for hundreds of miles. But the presence of the golden sands in these rivers by no means assures profitable work to those who attempt to get the precious metal.

MINT SUPERINTENDENT DODGE EXONERATED. The Commission, consisting of Alexander Ramsey, Thomas L. Young and S. O. Houghton, appointed to investigate the charges made by H. F. Page against H. L. Dodge, Superintendent of the United States Mint at San Francisco, has concluded its investigation, and submitted its report to the Secretary of the Treasury. The report fully exonerates Dodge from all charges preferred against him, concluding as follows: The Commission would respectfully report that the evidence did not establish any of the material charges made, but did establish the fact that, in place of being "extravagant," the Superintendent has been economical, and has operated the Mint within the appropriation to the extent of $95,000 of the money appropriated by Congress for the support of this Mint, besides having reduced the estimates for the appropriations from year to year since the beginning of his administration; that instead of being "law-defying," he has followed the law and instructions in every particular charged, and that instead of being corrupt he has been honest, and his administration has been free from the slightest touch of corruption. The members of the Commission are satisfied and feel that they would not be discharging their full duty if they did not state to you that the charges were without any foundation, in fact, were, in their opinion, in all probability the result of misinformation communicated to Mr. Page by friends who sympathized with him in his political quarrel with Mr. Dodge, and that but for such misinformation and the fact that Mr. Page considered himself aggrieved by the discharge of his friends and appointees from the Mint, the charges would probably not have been made.

INCREASE IN THE STOVE INDUSTRY.—During the last five years the increase in the value of stoves manufactured in the United States has been 35%. The total value for 1881 is estimated at $65,000,000.

Extraction of Gold from Sulphurets—No. 2.

(Written for the MINING AND SCIENTIFIC PRESS by C. H. AARON.)

Prominent and promising among new schemes is the project of applying the chlorine under heavy pressure, while agitating the ore in presence of water. This is known, or is becoming known, as the Mears process. To those who are acquainted with the nature of chlorine, it will not seem surprising that considerable difficulty was encountered in the application of this method. It is asserted that these difficulties have now been overcome, and that the results are eminently satisfactory. The process has been carried on for some time in the Eastern States, and works have recently been established in California. The sulphurets treated here are said to be unusually refractory, to contain about 4 ozs. of gold to the ton, and the tailings, it is affirmed, retain only one dollar to the ton. At the same time, it is claimed that the plant is cheaper, and the operation cheaper and quicker than by the ordinary Plattner process. If these statements are true, it ought to be but a short time until the Mears process supersedes the older method entirely. But, *"festina lente."* Let us await the verification of time. We have been disappointed too often to be over sanguine.

Interested though we all are in the subject of a better method, in regard to new metallurgical processes, the attitude of doubt is the attitude of common sense, taught by experience. That the prime cost for the installment is less on this new system than on the old, is difficult to believe; that the saving in the item of chlorine alone is 90 cts. per ton of ore, at San Francisco rates, as has been stated, is impossible.

That the action of chlorine is accellerated by heavy pressure has long been known (and there may be a doubt as to the validity of a patent claim on this point, *perse*), hence we were prepared to bear that, by this method, coarse gold, as well as fine, could be dissolved in a reasonable time, and that an exposure of from 15 minutes to two hours is sufficient for the chlorination. But charged vats eat nothing, and, in the humble opinion of the writer, the advantage of the Mears process depends, not on the celerity of its operation, but on the perfection of its results, and the durability of the apparatus. When the machinery for the works at the Bunker Hill was being made, a person who was in a position to know, assured the writer that it was very expensive, and if it is going to be quickly destroyed, that circumstance will militate greatly against the process.

No sooner does an inventor lay before us a scheme of any importance than others come to the front, in the endeavor to equal or surpass him. Accordingly the Mears process is followed by another modification of that of Plattner, which comes to us all the way from Maine. It consists "in exhausting the air from the vessel containing the ore, prior to admitting the chlorine;" in storing the gas in a gasometer, etc. The ore under treatment is "tumbled over itself" in a rotating cylinder, and "when chlorination is complete the ore is to be taken out, either wet or dry, and leached."

This reads very much as though the inventor had evolved his invention in the same manner as the Dutchman evolved the picture of a camel, namely, out of the depths of his own interior consciousness, without any practical knowledge of the matter. The invention seems to be of that large class which are suggested by simply *reading* of some other, and are the offspring of a greedy desire to undermine or circumvent the results of labor and ingenuity, without the expenditure of either. The Mears process also exhausts the air, and uses a gasometer, and on the whole offers a more reasonable prospect of improved results. An older plan than the two last mentioned is, to leach ores which contain gold alloyed to a considerable extent with silver, or too coarse for the ordinary method, with brine of common salt saturated with chlorine. This method was successful, though slow. It works much faster when pressure is applied.

We now come to a process which has been proposed and experimentally demonstrated on a small scale by Mr. Dixon, in Australia. This gentlemen experimented on a laboratory scale on arsenical and other pyrites by the ordinary method, and by means of bleaching powder and sulphuric acid, without success. He then devised and tested the plan of which the following is an outline:

The ore was roasted in a muffle, the fumes being conveyed into a tower in which they were condensed by water flowing over leaden shelves. The liquid thus obtained was a mixture of sulphuric and sulphurous acid with water. The thoroughly desulphurized ore was mixed with charcoal powder and exposed to heat, the oxide of iron being thus reduced to metal in powder, or iron sponge. This substance was dissolved in the acid liquid from the tower with great ease, and the gold remained in a favorable condition for amalgamation with quicksilver, ecorification with lead, or chlorination, in the insoluble residue of quartz, sulphate of lead, etc. Mr. Dixon also recovers copper, when present, by an ingenious manner of treating the solution which it is not necessary to describe here. Those wishing to know more about this interesting process, and the means proposed for its practice on the large scale, are referred to the *Chemical News*, Vol. XXXVII., page 281, *et seq.*

A good deal of remark and surprise has been excited by certain statements made by the writer, touching the volatilization of gold during the roasting of auriferous pyrites with salt. It appears, however, that the volatility of gold under the influence of chlorine is not so new as some of us supposed. It is stated that attention was first called to this fact by Boyle. In the *Chemical News* of March 19, 1869, a method of assaying gold quartz, by Bertelot, is given, in which the gold is volatilized in a current of chlorine, at a cherry red heat, and is condensed in metallic state in a cooler part of the apparatus, where the chloride decomposes in cooling. Again, in the issue of November 19th, same year, it is stated that chlorids of gold (terchloride ?) is decomposed at 200° (centigrade presumably) into chlorine and a lower chloride, and at a higher heat, into chlorine and gold. It is, however, also stated that chloride of gold can be volatilized in a current of chlorine at 300°.

If the writer is not in error, Plattner states that, in the chloridizing roasting of ore containing gold, that metal is converted into terchloride, which is afterward decomposed, at a higher heat, forming, first, protochloride, and then metal, with evolution of chlorine. It is not irrational to suppose that, in a very slow roasting, such as is given to auriferous pyrites, a considerable portion of the terchloride may be evaporated before the heat is sufficiently high for its decomposition, especially in a three-hearth furnace, in presence of the chlorine evolved from the finishing hearth, although this latter condition does not seem to be necessary, as more than 50% was, in one experiment, evaporated in the muffle, where no such condition existed. The only matter of surprise would seem to be, that but little of the gold remained in the flues and dust chambers, which were quite extensive, possibly the presence of base chlorides, or the sooty lining of the chambers, had some effect in preventing the deposition of the gold. It frequently happens that a large percentage of salt is used in the roasting of pyrites on account of the presence of talc in the ore, yet no great loss of gold is experienced, although the salt may be charged with the ore. The explanation may lie in the fact of the presence of talc, which, by absorbing the greater part of the evolved chlorine, prevents the latter from combining with the gold. Certainly, in the roasting of such ore, the smell of chlorine is at no time very strong, nor is it perceptible until the roasting is so far advanced that the heat is far above 200° centigrade.

Note.—From Mr. Atwood's article on "The Milling of Gold Quartz," it appears that the learned gentleman still adheres to the belief that nearly all the gold in pyrites is chemically free, and may be collected by amalgamation if the material is ground sufficiently fine. Mr. Kustel in his work on roasting ores, etc., expresses a different opinion. Some time since the writer made an experiment, with the view of vindicating his own and Mr. Kustel's view. Some sulphurets from Nevada county were digested in a solution of sodium polysulphide, with the addition of free sulphur, by which gold sulphide, if present, ought to have been dissolved, but on testing the liquid for that metal, not a trace of it was found. Mr. Dixon, of Australia, whose proposed process has been outlined above, made exactly the same experiment, with the same result. This may be conclusive as to the presence of simple gold sulphide, but does not prove that the gold is metallic, and the absolute invisibility of the greater portion of the metal in finely ground sulphurets, with the aid of a good lens, even in cases in which it is plainly visible to the naked eye, after oxidation of the material, points to the suspicion that it *may* exist as a compound of iron, gold and sulphur. Such a compound can be made in the dry way, but it must be admitted that pyrites are more probably of aqueous, than of igneous origin, and it is abundantly certain that metal sulphides can precipitate metallic gold from a solution of terchloride, though such precipitation is accompanied by oxidation of the sulphide, at least in the laboratory experiment.

It is not, however, proposed to argue the question on theoretical grounds; and as to the practical question of the possibility of working sulphurets by amalgamation, as advocated by Mr. Attwood, that, at least, is surely susceptible of a practical answer. There are, at the present time, many mine owners who are considering the project of establishing chlorination works at their mines, and who would doubtless be much obliged to anyone who would demonstrate that amalgamation; without roasting, would be better; but they will not be convinced by statements of what is done in so remote a country as Brazil. As Mr. Attwood seems to feel considerable interest in the subject, it may not be impertinent to suggest that it would not cost him much to make a few tests on samples of alleged refractory sulphurets, and he would then be able to give us facts which we could verify for ourselves, instead of theories and assertions, of the accuracy of which we have no means of judging. For the purpose of such tests, it is suggested that the sulphurets of the Murchie mine, in Nevada county, and of the Bunker Hill, would be suitable, as being rather difficult to work by the chlorination process.

It is true that we might make these tests for ourselves, but our failure would probably not convince Mr. Attwood, nor, in the face of his persuasions, would it be entirely satisfactory to ourselves, while his failure or success would go far toward settling the question in all of our minds. Mr. Dixon's tests on Australian sulphurets were signal failures, both by amalgamation and chlorination—the ore being roasted in both cases—but that circumstance does not by any means prove that either process is inapplicable, as the failure may have resulted from incorrect manipulation. One success is worth more, as an argument, than a dozen failures; yet on the other hand, a large number of failures has a certain force, especially as against mere theories.

Touching the concentration of sulphurets, in a small way, as a check on the larger operation, it is suggested that while the latest is an excellent instrument in skillful hands, a great deal of time and labor may be saved by the use of Sounstadt's solution, by means of which all matters of a less specific gravity than 3.01 may be separated by flotation from denser substances. This solution is made by adding to water the iodides of potassium and mercury alternately, in a dry state, until neither is dissolved. The density can be adjusted to any point below the above figure, and the solution is said to be very useful in the separation of different minerals, as diamonds from other stones, for the purpose of microscopic or other investigation. As it is more than probable that Mr. Attwood is familiar with this subject, the writer does not presume to address the suggestion to that gentleman, but others may find it useful.

Moro Rock.

One of the prominent landmarks on the southern coast of California is El Moro, a high coni cal rock not many miles above San Luis Obispo. This curious rock, shown in the engraving, is on Estero bay, which was discovered by Cabrillo as long ago as 1546, and here he obtained wood and water. Behind El Moro are several lagoons or streams, and the high land retreats for some distance, leaving the shore low and sandy. From Moro up the coast or as far as Piedras Blancos the hills set well back from the shore, leaving a tract which is now covered with thrifty farms, dairy ranches, etc., the towns of Cayucos, Cambria and San Simeon being the center of the settlements.

MORO ROCK, ON THE CALIFORNIA COAST.

The big Moro rock marks the entrance to Moro bay, which is a sort of lagoon or arm of the sea, immediately behind the protecting rock. Once behind the rock a small vessel is safe from all winds, but the entrance is so difficult that the insurance companies will not underwrite on vessels trading there. The place is really unsafe for sailing vessels, but small light draught schooners trade there. There are several small wharves in the lagoon, and produce is brought from the head of the bay in small sloops down to the steamer or schooner. Lumber is carried to this bay, and dairy produce, wool, hogs, etc., are shipped. Shipments from the wharf in this little bay last year were 12,337 sacks of flax seed; 10,944 sacks of wheat; 4,726 sacks of beans; 1,160 hogs. The imports were mainly lumber. It is a good farming country in the vicinity, the land being a sandy loam. Further south along the coast lies the Canada de las Osas rancho, of 32,430 acres, adjoining on the south of which is the Migalito rancho of 22,135 acres, nearly half of which is waste mountain land. It is only a few years ago that this whole region was a pastoral one; but now farms, dairies and little settlements dot the landscape.

AMERICAN INDUSTRY ABROAD.—The British army in South Africa, in the course of the war with the Basutos, found and destroyed some American plows. The fact is significant as showing how far-reaching is the American name and influence. The American threshers breaks the quiet and sleepy valleys of Palestine. The American mower and reaper perform the labor-saving operations among the vines and fig trees of Asia Minor. American agricultural implements carried off the prize last summer at a fair in Bulgaria, not far from where American Martini-Henry rifles, in the hands of the Turks, ranging a mile further than the old-fashioned weapons of the Russians, made deadly havoc on the fields of Plevna. American locomotives thunder over the plains of Southern Russia, and through the gorges of the Caucasus to Tiflis almost on the confines of Persia.

RANSOM COOK, who recently died in Saratoga county, N. Y., at the age of 80, was said to have been a proficient in 26 trades and the owner of 27 patents.

Status of Mining Industry in California.

[Written for the PRESS by JOHN HAYS HAMMOND.]

In answer to your letter I will say that other engagements and absence from the city have prevented my earlier compliance with your request.

During the year 1880 as special expert of the U. S. Geological Survey and Mineral Census, I made a thorough examination of the geological and mineralogical features of the ore deposits of California, the mining and metallurgy of the same, and all questions pertaining to the economy of vein and placer mining in this State.

In making this investigation, I visited nearly every mine from Kern to Sierra county, including the mines of the Bodie and other districts in the mineral belt along the eastern flank of the Sierra Nevada mountains.

My examinations were made under exceptionally favorable auspices, in having, as I did, access to the books containing the accounts of the different mining companies, being enabled thereby to obtain complete and reliable data upon which to base an opinion of the present status and the future prospects of our mining industry.

The causes to which are referable the many failures that have attended mining investments, the remedies to be adopted to prevent a recurrence of these disasters, and the means to be employed to obtain for California the just recognition of its transcendant merits as a field for mining enterprises, have been subjects of my constant consideration, and for the realization of the desiderata you may rely upon my earnest co-operation.

I believe that no other State or Territory in the Union can show

As Large a Bullion Production

In proportion to the capital invested in developing the mineral resources.

No other section of the Union offers, in my opinion, as great inducements as this State, for the prosecution of legitimate mining, in that it costs less to obtain possession of a property here than elsewhere, a smaller expenditure is required to prospect it, and, in the event of the preliminary exploration proving the property worthy of exploitation, it also costs less to mine and to reduce the ore.

The salubrity of the climate of this State, the accessibility of its mines, comparatively speaking, admits of the prosecution of mining work, unaffected by climatic inclemencies, the acquirement of skilled labor at reasonable wages, and the cheap transportation of mining supplies—conditions of much economical importance in the discussion of the relative advantages of mining districts.

The almost universal abundance of wood and water in this State is, too, a feature of incomparable advantage.

The indispensable condition of profitable mining is, of course, the presence of pay ore in sufficient quantities, and this condition is fulfilled, as the data collected during my investigations indisputably attest.

The Geology of Our Gold-bearing Formations

Is now well known, and no mining geologist of note will, in view of the proofs to the contrary, entertain any doubts as to what is known in mining technology as the permanency of our veins.

The theory that our veins are limited in depth has long since been admitted untenable, and it is surprising how a notion so much at variance with the facts of the case, could have obtained so generally.

That the pay-ore is not co-extensive with the ore-bearing formation is well known, and the term permanency, should, for the sake of greater perspicuity, refer to the continuity and persistency of the vein in its course and in its dip—irrespective of its gold tenor.

The size, in its three dimensions—width, depth and length—of the pay-shoot is one of the determining conditions in the appraisement of mining properties, and the laws pertaining to the zonal distribution of the pay-ore in our auriferous quartz veins, are (or ought to be!) so well understood by the mining men of today that the cost of prospecting or exploratory work should be reduced to a minimum.

I shall be pleased, at some future opportunity, to contribute an article upon this subject, in connection with the discussion of the geological and mineralogical features of the great Veta Madre or mother lode of California.

My theory as to the genesis and character of this great formation is essentially at variance with that generally entertained, and with due deference to other geologists who have written on the subject, I feel confident of being able to substantiate my iconoclastic theories.

Want of business foresight, precipitancy in the erection of costly mining and milling plants, the failure to open up pay-ore reserved for future requirements—in short, a most persistent disregard for the very fundamental principles requisite for success in commercial pursuits, have often entailed financial catastrophes upon mining enterprises that possessed intrinsic values.

There is, in my judgment,

A Bright Future

For the mining interests of this coast. The revival of active interest will be slow, but none the less sure.

Capitalists will gradually come to the conviction that where chances of failure are less, where the costs of their "specs" are also less, and the rewards of their successes are as great as elsewhere, is the best field for their mining investments.

In these respects, California, I am of the opinion, "fills the bill" better than any other mining country.

The old saying, that "distance lends enchantment to the view," finds its verification in the great attraction that the terra incognita of Arizona and the Mexicos seem to have for capitalists; but, as I have said, there is a growing change of opinion in this regard, and a steady progress is being made in the development of our inexhaustible resources.

Mining has received a temporary set back in the unfortunate controversy that has arisen between the agriculturists and the miners.

As regards the ultimate solution of this all-important problem, I have no serious apprehensions, and I believe, with others who have studied the question, that the issues threatening the two interests—as indissolubly connected and as interdependent as were the Siamese twins—will be adjusted without prejudice to the well-being of either.

To the engineering skill of the State Engineer's department we must look for the only equitable settlement of this question, and if "judgment has *not* fled to brutish beasts, have *not* lost their reason," the twin interests of agriculture and mining will co-operate and reconcile their differences upon a basis the most mutually advantageous.

Tunnel Work.

There is no part of the world where so much tunnel work is carried on as in California. There is, of course, more or less tunnel work in quartz mining, but in drift mining operations, very long tunnels are necessary in many cases, for "bottoming" the gravel channels. Long tunnels have often to be run in hydraulic mining work, also. As an instance of quick work in this line, may be cited the tunnel being run by the Ruby Gravel Co., in Cariboo ravine, one mile south of Rock creek, Sierra county. It is thus briefly described by the local paper, the *Mountain Messenger:*

Work was commenced last December, and since that time 2,050 ft. of tunnel have been made. In round numbers the tunnel, all but a few hundred feet of the outer end is 10 ft. square, nearly all through hard rock that required blasting, and that stands without timbers. For 1,950 ft., the tunnel follows an air line, the course being a little north of east. The last 100 ft. is turned to the south 17° from the former course. The grade of the tunnel is ½ inch to 12 ft. At the mouth of the tunnel the company have a substantial engine house, and a powerful engine which drives the air compressor and a Struve two-plunger ventilating pump. From the compressor the air passes to a large, upright reservoir of heavy boiler iron, about 10 ft. in hight and 4 ft. in dimeter. From this reservoir the air is taken, under a pressure of 50 lbs. to the square inch, in 4-inch wrought iron pipe, to the drills, running along the bottom of the tunnel.

The air from the ventilating pumps is taken in a 12-inch air pipe and boxes to near the face. The last 150 ft. of tunnel is in softer rock, a species of quartzite, so hard as to require blasting, but not hard enough to stand long without timbering and spiling. About 150 feet from the face a shaft has been started, and is now up about 40 ft. in blasting rock. It is designed to test the question as to whether or not there is gravel overhead. Mr. H. Jennings is now Superintendent of the works, Mr. H. Wallis acting in the capacity of consulting engineer. Mr. Edge is the engineer in charge of the machinery. For rapidity of construction and size of tunnel, there is probably nothing in California that exceeds this work. From its inception until within a few weeks H. Wallis has been Superintendent in charge, Hamilton Smith, Jr., being Superintendent in Chief.

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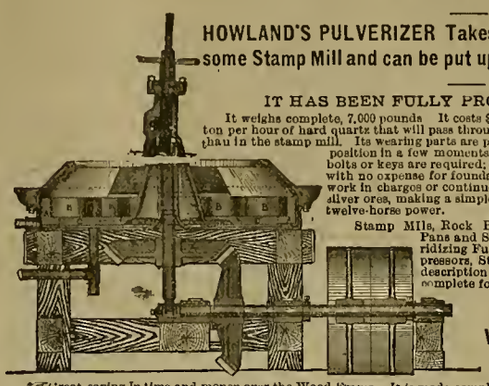

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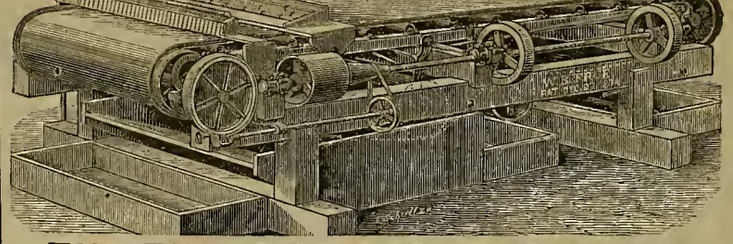

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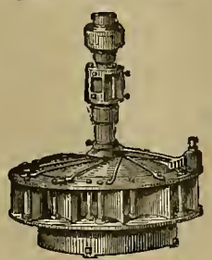
Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.
We challenge any other Concentrator in use for a fair and impartial competitive trial, side by side, for stakes of **$1,000** each, and we mean business.
☞A machine with all improvements can be seen in working order and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont street.

ADAMS & CARTER, Agents, Room 7 No. 109 California Street, S. F.

LEFFEL'S IMPROVED WATER WHEEL.



PRICES REDUCED!
PATENTS REISSUED 1868.
The "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.

Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address

JAMES LEFFEL & CO., Springfield, Ohio, and 110 Liberty St., N. Y. City.

PARKE & LACY, Sole Agents, 21 and 23 Fremont St., S. F.

Excelsior Blasting Powder,
—MANUFACTURED BY—
THE EXCELSIOR POWDER COMPANY.

This is no NEW PATENT NON-EXPLOSIVE SAFETY POWDER, but the GENUINE STANDARD ARTICLE, and as safe to use and handle as any Nitro-Glycerine Powder manufactured. The Fumes and Gases, common in other Nitro-Glycerine Powders, are almost destroyed, and do not leave the miner with headache or nausea. Among the numerous recent testimonials the following is but a fair sample, constantly received, attesting the superiority of EXCELSIOR POWDER:

AUBURN, Cal., May 26, 1881.—EXCELSIOR POWDER CO.: I send you, per Wells, Fargo & Co., a box containing samples of country rock through which I am running our tunnel on the Conrad Mine, and through which we have now run 425 feet, 225 feet of it having been done with EXCELSIOR POWDER. If any one can produce harder rock I would like to see it. I here say that I can do more execution with your No. 2 Powder in this rock than I can with any No. 1 Powder of any manufacture I have ever used, and I have used every kind now manufactured here, excepting "Tonite," and I have had 20 years' experience in blasting. Respectfully yours, E. W. ROBERTS, Superintendent.

Give this Powder a trial and you will use no other. For Strength and freedom from noxious fumes, it has no equal. Address all orders to EXCELSIOR POWDER CO., No. 330 Pine Street, Rooms 53 and 54, Academy Building, San Francisco, Cal.

SELBY SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.

Gold and Silver Refinery And Assay Office.

HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.

Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.

This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY. - - Superintendent

Mines and Mining Properties Solicited for Sale.

I have unexampled facilities for rapidly placing Mines and Mining Properties, and claims of
Ascertained Value
Upon the Market, through my Branch Offices in
NEW YORK, BOSTON, PHILADELPHIA, CHICAGO, ST. LOUIS, LONDON, ENGLAND.

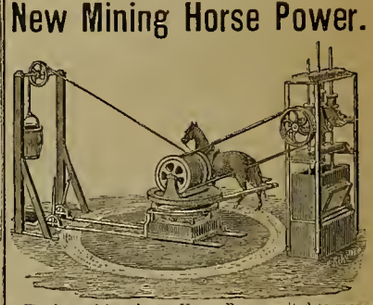
OWNERS OF
Meritorious Mines and Prospectors
WHO HAVE NOT THE MEANS TO PROPERLY DEVELOP THE SAME MAY FIND A PURCHASER THROUGH MY OFFICE.

If You Have a GOOD MINE, or a GOOD PROSPECT for sale, apply to me in person or by letter.

JAMES A. MARS,
45 to 49 Merchants' Exchange, California St
SAN FRANCISCO, CAL.

REFERENCES:
London and San Francisco Bank, S. F., Cal.
Anglo-Californian Bank, S. F., Cal.
John J. Valentine, Superintendent Wells, Fargo & Co.'s Express, S. F., Cal.
J. B. Haggin, Capitalist, S. F., Cal.
Louis A. Garnett, Capitalist, S. F., Cal.
Daniel Meyer, Capitalist, S. F.
Prof. Thos. Price, M. E., S. F., Cal.

New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.

C. H. BAKER,
Agent and Manufacturer of Mining Machinery
18 and 20 Fremont St., S. F.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientifi Press," U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING AUGUST 30, 1881.

246,362—DREDGER—H. B. Angell, S. F.

246,397—INSECT PROOF SAFE—C. H. Larrabee, Napa California.

246 392—ORE FEEDER—F. A. Huntington, S. F.

246,500—BROOMS—Geo. Hall, Santa Rosa, Cal.

246 555—CART—D. W. C. Putnam, Petaluma, Cal.

246,383—CAR COUPLING—S. J. Ford, Placerville, Cal.

246,420—TRACTION APPARATUS FOR CABLE R. R.—H. Root, San Francisco.

246,361—CABLE CURVE—A. L. Anderson, S. F.

246,372—HYDRAULIC GRAVEL ELEVATOR—G.] W. Crans ton and B. Willson, S. F.

246,386—HORSE COLLAR—Grabel & Stanfenbeil, Ventura county, Cal.

246,387—THERAPEUTICAL GALVANIC BELT—Ira Gray S. F.

246,523—WIRE ROPE RAILWAY—Joel B. Low, S. F.

246,424—SOLAR REFLECTOR FOR SURVEYING INSTRUMENTS—Wm. Schmolz, S. F.

246,606—AX—P. R. Smith, Portland, Oregon.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

CAR COUPLING.—S. J. Ford, Placerville, assignor to George E. Williams, same place. Dated August 30, 1881. No. 246,383. This invention relates to certain improvements in drawheads and couplers for railroad cars, by which the inventor is enabled to unite cars of different hights by the use of the ordinary link.

ORE FEEDER FOR CRUSHING MILLS.—Frank A. Huntington, S. F. Dated, Aug, 30, 1881. No. 246,392. This improvement in ore feeders consists in a novel combination of a double feed hopper having two oppositely projecting feeding spouts or troughs with crushing apparatus upon opposite sides of the feeder, each being provided with a means for actuating the spouts and causing them to discharge ore with the crushers as required.

SPRING ATTACHMENT FOR SAWS.—E. Milburg, Callahan's ranch, Siskiyou county. Dated August 23, 1881. No. 246,033. This invention attaches a stout spring to the end of a cross-cut saw, such as is used for sawing trees. On one side of the tree-trunk some staples are driven, and into these are inserted the end of the spring. The other end of the spring is connected by chain-hinge or link. The saw is partially made to recover itself by the power of the spring, which renders assistance in pulling it back. It holds the saw well against the wood, and thus relieves the sawyer from much of his exertion to press the implement to its work. Its advantage is best seen in cutting upright timber. In such sawing it is inconvenient to press the saw in sidewise; but with this spring attachment this is accomplished. One man can thus use a long and heavy saw, which would otherwise require a man at each end.

A USEFUL PAPER.—One of the best and most useful papers published in California is the MINING AND SCIENTIFIC PRESS, published by Dewey & Co., in San Francisco. The edition of September 3d contains 24 pages of matter of more than ordinary interest, and every page has more or less of interest to the progressive industrial reader. In this issue a great deal of space is given to a very complete description of the cable railroad system which had its birth in San Francisco and which has fully developed there. It also gives an idea by illustrations of the various attempts made at the street railway system before it was perfected. In every number of the MINING AND SCIENTIFIC PRESS is to be found a synopsis of mining news from over the State, besides a great amount of useful reading matter not usually found in other journals. It only costs four dollars a year, and is worth ten times that amount to anyone interested in the progressive arts and sciences so rapidly advancing at this great age of inventions and improvements.—*Mariposa Gazette.*

AMERICAN LEATHER.—It is a seemingly strange fact that the hides of American cattle shipped to England on the hoof are reimported, tanned into sole leather here, and again exported. The cheapness of hemlock bark in this country is gradually giving our tanners a monopoly of the business of tanning sole leather, though the finest uppers are made in Europe.

THE PAPER INDUSTRY.—The present total capacity of all the paper mills of this country is set down at 2,500 tons per day of all kinds of that material. The out-put for 1880 is estimated at 25 per cent. over that of 1879. So large is the surplus that a combination of 307 manufacturers in July last offered a very large amount of paper for export without limit as regards price.

MINING MACHINERY FOR MEXICO.—Large amounts of mining machinery are being sent forward from New York to Mexico, to develop new and work old mines. The introduction of railroads into that country will greatly encourage and develop its mining industry. California should look more carefully after her interests in that direction.

The Panama Canal.

(CONTINUED FROM PAGE 185.)

The daily averages are between 29° 4′ and 26° 2′ C.

These meteorological observations have been regularly made at Colon at the mouth of the Rio Janeiro (Pacific) and at Gamboa (the central point on the Chagres. Borings have been made along the line of the canal across the Calebra to determine the character of the ground. Six shafts have been sunk between kilometric points 51 and 56. The deepest, which is 50 meters deep at station 51, struck hard rock at 43 meters. The next one, at station 52, at 23 meters, struck a bench of very hard rock, of 2 meters and more in thickness. Then it ran into a conglomerate; and then a second bench of very hard rock was struck. Finally they passed through a very thick bench of very hard rock, which they struck at 31 meters.

The other shafts have only indicated an argillaceous conglomerate. Finally, to determine the character of the ground at Empserador, a large shaft having a sectional area of 10 meters, has been sunk. At a depth of eight meters, they came across angular pieces of dolorite imbedded in a mass of colored sand.

The shafts are timbered, and have two compartments. Six houses have been built at Emperador for the corps of miners. A large carpenter shop, blacksmith shop, etc., have been put up for convenience in the shaft work. The frame-work and machinery for the sinking to 100 meters have been received and housed in. At some of the shafts palm roofs only have been put up to protect the men from the rain and the rays of the sun.

The Richmond-Albion Findings.

It will be remembered that the Richmond-Albion mining suit, was tried in the District Court, at Eureka, and decided in July last. The attorneys have been worrying over the "findings," but have finally settled the matter and the "findings" have been filed with the clerk. There are 31 special findings of fact. Notwithstanding the positive injunction of the court that the instrument should be withheld from the newspapers, the *Sentinel* has managed to procure a synopsis of it, and proceeds to submit it to the public as follows:

The court finds that the Uncle Sam mining claim, belonging to the Albion, was located prior to both the St. George and Victoria claims, belonging to the Richmond company; that the necessary work had been performed on the Uncle Sam each year; that an application for a patent was made by the Richmond company for the St. George claim; that a protest was filed in time and suit begun by owners of the Uncle Sam; that the $5 docket fee was paid by the owners of the Uncle Sam within the meaning of the statute; that such suit was prosecuted with all due diligence under the circumstances; that pending this suit the Richmond company obtained a patent for the St. George ground; this patent is the clared absolutely void for the reason that it was obtained pending proceedings and suit in de- District Court; that the Victoria patent for this same ground was obtained by the Richmond company after the issuance of the St. George patent; that no protest was made by anyone against the issuance of the Victoria patent, and that it is therefore good and valid; that the mining premises embraced in the Victoria patent covers most of the ground included in the St. George patent; that the Tip Top westerly end line extended should be at the point contended for by the Richmond; that the Tip Top is the prior patent in that locality; that there is one great lode or mineralized zone on Ruby Hill, extending in width from quartzite to shale; that all of the locations offered in evidence in this suit are situated on this great lode; that the first patent is entitled to everything between these walls; that the Richmond company has a valid title to all the mining ground embraced in the Victoria patent; that the Uncle Sam is entitled to the rest; that judgment is given in favor of the Albion for this last mentioned portion of the Uncle Sam ground, together with costs of suit; and finally, that all facts not specifically passed upon are found for the Richmond.

The above constitutes the whole pith and essence of the findings. A few minor points were omitted as unimportant matter. The case now goes to the Supreme Court on this statement.

Meetings and Elections.

DUDLEY M. CO.—Sept. 15. Directors, A. J. Ralston, N. K. Masten, J. M. Quay, W. M. Stewart, R. N. Graves. President, A. J. Ralston; Vice-President, N. K. Masten; Secretary, C. Van Dyck Hubbard; Treasurer, Bank of California; Superintendent, W. P. Holmes.

NORTHERN BELLE M. CO.—Sept. 13. Directors, G. T. Lawton, H. H. Allen, W. E. Norwood, B. P. Murphy, S. Reinhart. President, G. T. Lawton; Vice-President, H. H. Allen; Secretary, Wm. Willis; Treasurer, Bank of California; Superintendent, R. J. Jones.

MAYSELLE CON. M. CO.—Sept 13. Trustees, Wm. M. Stuart, (President), Wm. F. Herrin (Vice-President), Wm. B. Carr, R. N. Graves, and A. J. Ralston. Wm. J. Taylor, Secretary, and B. R Taylor, Superintendent.

New Incorporation.

FIDELITY M. CO.—Sept. 13. Location, Calaveras county. Capital, $10,000,000. Directors, J. B. Curtis, E. P. Gray, Giles H. Gray, F. J. Allison and Frank Cummings.

News in Brief.

GRAPE distilling will begin October 1st in Los Angeles.

CARP ponds are being built in many portions of Placer county.

GENERAL BURNSIDE died suddenly at Providence on Tuesday.

THE stage between Bisbee and Charleston, A. T., was robbed of $2,500.

THERE is talk of founding a historical and antiquarian society in Los Angeles.

THE California pioneers in New York had a grand time at Coney Island on Admission Day.

THE White Mountain Apaches, who are on the war-path in Arizona, number 750 all told.

NEAR Corfu, N. Y., forest fires have attacked the clearings, compelling families to abandon their homes.

he liberally endowed.

TWO hundred people were killed and 30 houses destroyed by a landslide at Elme, Switzerland, Sunday night.

THE California Southern railroad is now regularly carrying freight by rail between National city and San Diego.

J. R. KEENE says that he did not lose $1,500,000 in Hannibal and St. Jos Railroad stock, as was reported lately.

SEVERAL persons have been taken into custody on suspicion of being connected with the Cape Horn Mills train-wrecking.

FEARS are expressed in diplomatic circles at Constantinople, that the situation in Egypt may lead to differences between France and England.

A WELL at Benicia bored for artesian water has struck gas, and it is proposed to light the arsenal and barracks. The well cost the government $51,000.

THE pressing need of this season in Mendocino has been more laborers in harvest and hop fields, on sheep and dairy ranches, in the coast timber belt and at the mills.

ONE of the guards at the Washington jail "took a shot" at the assassin Guiteau, and came near depriving that scoundrel of the privilege of a trial for his crime.

HANLAN offers to row Wallace Ross, or any man in the world, a three or four-mile race, for from $2,000 to $5,000 a side, on a course to be mutually agreed upon. This will be his last race.

THE rebellious Egyptian officers refuse to accept the conditions offered unless their previous demands are first conceded, and boast they have the support of 80,000 Bedouins.

THE conference to consider State division met Thursday in Los Angeles. Delegates were present from San Bernardino, Ventura and Santa Barbara. Little business was done. Another meeting will be held in February.

THE steamer *Proteus* has arrived at St. Johns, N. F., from Lady Franklin bay, having accomplished her work. There is much ice in Lady Franklin bay. No tidings of the missing *Jeannette.*

THE Ameer camped on the 10th instant eight miles southeast of Candahar. Firing was heard at noon on the 10th, and from morning until 4 o'clock on the afternoon of the 11th. Access to Candahar is closed.

THERE is great damage by fires in the neighborhood of Owen sound, Parry sound, Gravenhurst, Otterville, Stratford, Eden Mills, Burton and Zurich, all in Ontario, Canada West. A million dollars' worth of timber has been burned in the Parry sound district. Cattle are dying on all sides on account of the drouth.

FRAUDULENT "AMERICAN" COTTONS.—During a recent tour through Lower Egypt an American correspondent was astonished to find at Rosetta, Damanhour, Zagazig, and especially at the great fair at Tantah, a great quantity of cotton goods for sale purporting to be of American manufacture. These goods consisted of a wretched, flimsy fabric, filled up with "sizing." A large portion of them bore the word "Mexican" in large, English letters and underneath the word "American" in large Arabic letters. The traveler found, on consulting the official report of the Director of the Egyptian Statistical Bureau, M. Amici Bey, that no American cotton goods have been entered at the regular Egyptian custom house during the past five years. A small quantity of American cotton goods have entered Egypt by way of Smyrna, where the greater part of the duty was paid; but all such goods were found upon inquiry to have been of uniform, excellent quality. The presence of the fraudulent "American" goods is explainable only on the theory that the English manufacturers, who now monopolize the Egyptian market, have found a new way of "spoiling the Egyptian," by palming off upon him their "cheapened" goods as American, and thus momentarily avoiding the consequences of their cheating in the fabric, and at the same time doing untold harm to American manufacturers.

A LARGE force of Chinamen have commenced the work of filling up a tract of low land lying in the southern end of Portland, Or., belonging to the Oregon railroad and navigation company. This tract is over a mile long and one-quarter wide, and will have to be filled to a hight of 15 or 20 ft. The estimated cost of the work is $800,000. It is the purpose of the company to use the ground for machine shops, depot and warehouses.

The Mining and Scientific Press

Established May, 1860, this has long been the leading mining journal in America, and enjoys a large circulation among the more intelligent operators and workers in the gold fields of the world.

As a scientific and mechanical representative of the Pacific Coast, it is decidedly popular and a standard journal with the most thrifty industrial people of the Pacific States and Territories. Its authority is of the highest order, and its usefulness in its special sphere unrivaled.

Every public library, mining engineer, metallurgist, mining operator and intelligent mechanic and manufacturer will find profit by its reading.

Subscription, $4 a year in advance. Sample copies, 10 cts.

DEWEY & CO., PUBLISHERS,
No. 202 Sansome St., cor. of Pine, S. F.

Traveling Agents.

We want several canvassing agents who will make it their business to solicit subscriptions and advertising for our first-class progressive newspapers. Men of ability and experience can secure good pay and permanent employment. Send references and state your past occupation, etc., to the publishers of this paper.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—San Mateo and Santa Clara counties.
C. E. WETMORE—Alameda county.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct, or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We will send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

$40 RIFLE FOR ONLY $15.—The Evans 26-shot Sporting Rifle, advertised by E. G. Rideout & Co., 10 Barclay street, is a great bargain. We are positively assured that the retail price of these Rifles was $40 each; any one can get the same Rifle now by sending to the above named firm only $15. They offer to refund the money sent if the Rifle is not as represented. Read their large advertisement in this issue.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

ANNUAL STATISTICIAN of 1881.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 816 California st. Price, $4.

COFF'S "U. S. MINERAL LANDS, LAWS, FORMS, INSTRUCTIONS AND DECISIONS."—1881. 570 pp. In full law binding, $4.50; half law binding, $3, at this office.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending September 13, 1881.

HIGHEST AND LOWEST BAROMETER.

Sept. 7	Sept. 8	Sept. 9	Sept. 10	Sept. 11	Sept. 12	Sept. 13
29.989	29.949	29.969	30.003	30.014	30.060	30.143
29.900	29.874	29.839	29.916	29.958	29.971	30.032

MAXIMUM AND MINIMUM THERMOMETER.

61	60	66	60	59	62	69
51	51	51	51	52	54	54

MEAN DAILY HUMIDITY.

88	86.3	83.7	93	83.3	81.3	73

PREVAILING WIND.

SW	W	W	SW	W	W	SW

WIND—MILES TRAVELLED.

327	285	219	246	241	295	251

STATE OF WEATHER.

Fair.	Foggy.	Foggy.	Fair.	Foggy.	Fair.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1881. —— inches.

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, September 14, 3 P. M.

SILVER, ¼.

GOLD BARS, 890@910. SILVER BARS, 10@18 ₱ cent. discount.

EXCHANGE on New York, 5@10 premium; London, 49½@49¾; Paris, 5.20 francs ₱ dollar; Mexican dollars, 90@91.

NEW YORK (4 per cent), 116¾.

San Francisco Metal Market.

[WHOLESALE.

WEDNESDAY, September 14, 1881.

IRON.—			
American, Pig, soft, ton	—	@	30 00
Scotch, Pig, ton	—	@	25 00
American White Pig, ton	—	@	—
Oregon Pig, ton	—	@	26 00
Clipper Gap, White	—	@	26 00
Clipper Gap Car Wheel	—	@	35 00
Refined Bar	4½	@	8
Horse Shoes, keg	7 00	@	8 00
Nail Rod	—	@	9½
Norway, according to thickness	8½	@	9½
STEEL.—			
English Cast, lb	16	@	18
Black Diamond, ordinary sizes	13	@	15
Drill	15	@	18
Flat Bar	—	@	16
Plow Steel	15	@	16
COPPER.—			
Ingot	—	@	52
Sheet	—	@	20
Sheating, Tinned 14x18	—	@	42
Nails	—	@	—
Bolts	38	@	42
Old	—	@	18
Bar	—	@	22
Cement, 100 fine	—	@	15½
LEAD.—			
Pig	—	@	4½
Bar	—	@	6
Pipe	—	@	8
Sheet	—	@	9
Shot, discount 10% on 500 Bags			
Drop, per bag	—	@	2 10
Buck, "	—	@	2 30
Chilled "	—	@	2 50
TIN PLATES.—			
10x14 I C Charcoal	—	@	7 50
10x14 I C Coke	6 00	@	6 25
Banca Tin	—	@	25 00
Australian	—	@	23 00
I. C. Charcoal Roofing 14x20	—	@	7 25
" " " 20x28	20 00	@	21 00
ZINC.—			
By the Cask	—	@	9
Zinc, sheet 7x3 ft. 7 to 10 lb. less the cask	—	@	10
NAILS.—			
Assorted Sizes	3 50	@	3 75

Mining and Other Companies.

Persone interested in incorporated eharee will do well to recommend the publication of the official noticee of their companies in thie paper, as the cheapeet appropriate medium for the eame.

Consolidated Virginia Mining Company.

Location of principal place nf business, San Francisco, California. Location of works, Virginia Mining District, Storey County, State of Nevada.

Notice is hereby given that, at a meeting of the Board of Trustees, held on the twenty-second (22d) day of August, 1881, an assessment, (No. 16) of Thirty (30) Cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, 309 Montgomery street, Room 26 (Nevada Block), San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-fourth (24th) day of September, 1881, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on Saturday, the twenty-second (22d) day of October, 1881, at the hour of eleven (11) o'clock A. M., at the office of the Company, to pay the delinquent assessment, together with costs nf advertising and expenses of sale. By order of the Board of Trustees.

A. W. HAVENS, Sec'y.

OFFICE—Room 26, No. 309 Montgomery street (Nevada Block), San Francisco, Cal.

The Oxford Beta Tunnel and Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Aurora, Esmeralda County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the Twentieth (20) day of August, 1881, an assessment, No Twenty-nine (29), of Twenty (20) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Rooms of Dr. Knowles, 113 Dupont street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the Twenty-sixth (26) day of September, 1881, will be delinquent, and advertised for sale at pubbo auction, and unless payment is made before, will he sold on Monday, the Seventeenth day of October, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. H. PECK, Sec'y.

Office—Rooms of Dr Knowles, 113 Dupont street, San Francisco, Cal

Amusements.

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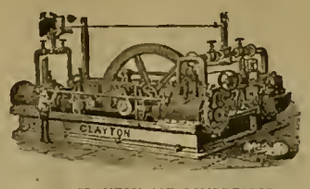

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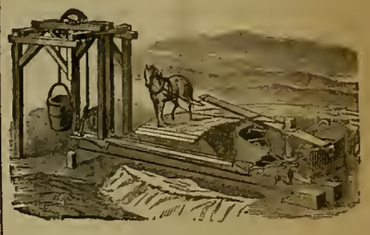

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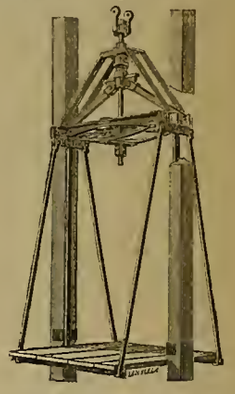

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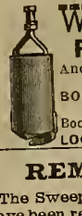

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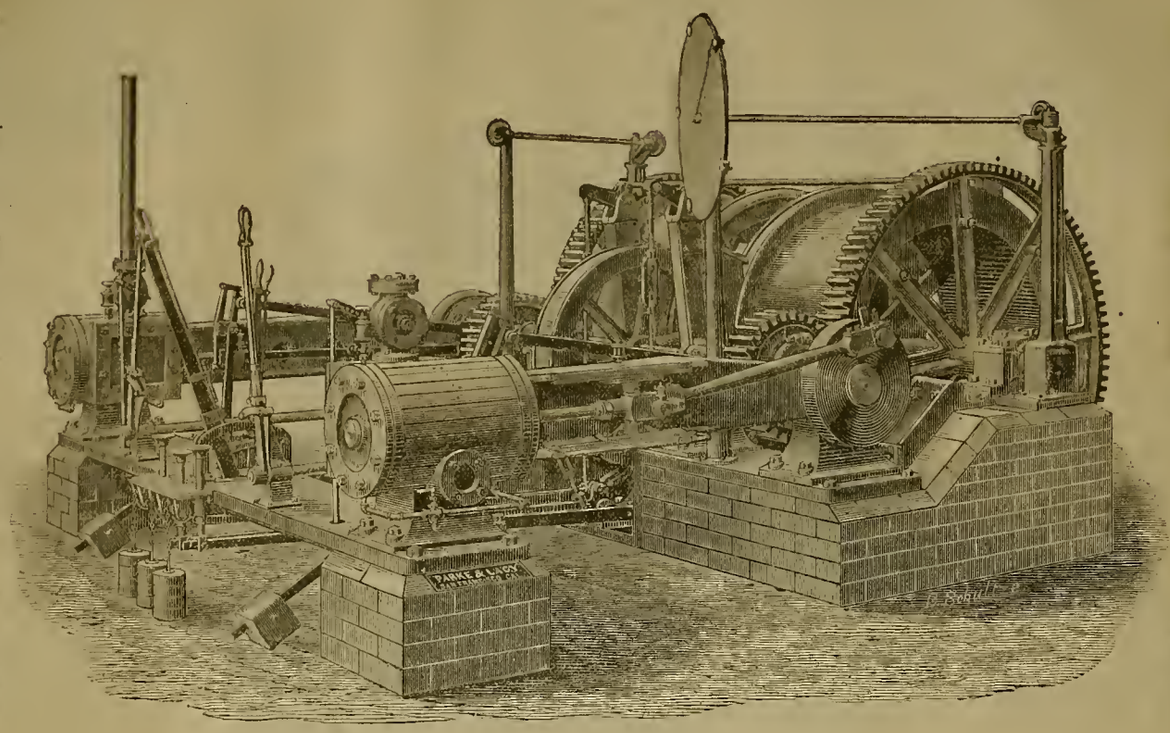

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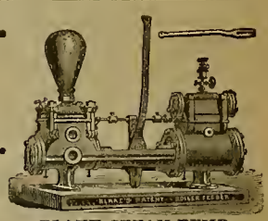

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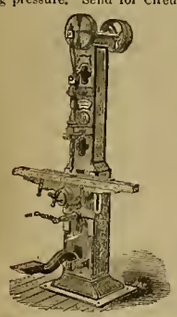

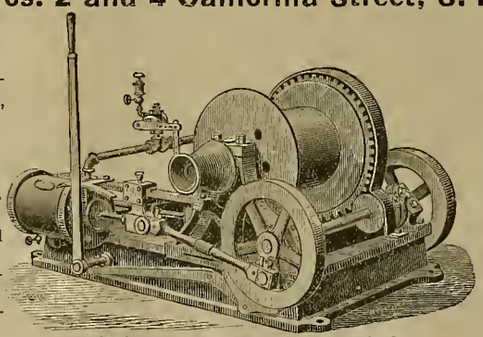

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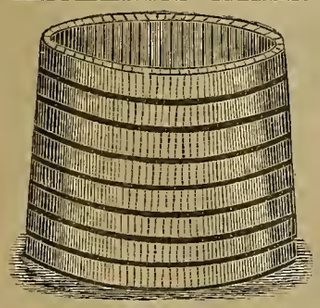

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Office:
759 Market St., San Francisco
From 11 A. M. to 3 P. M.

"THE $1,000 CHALLENGE"

Ore Feeder for Quartz Mills.

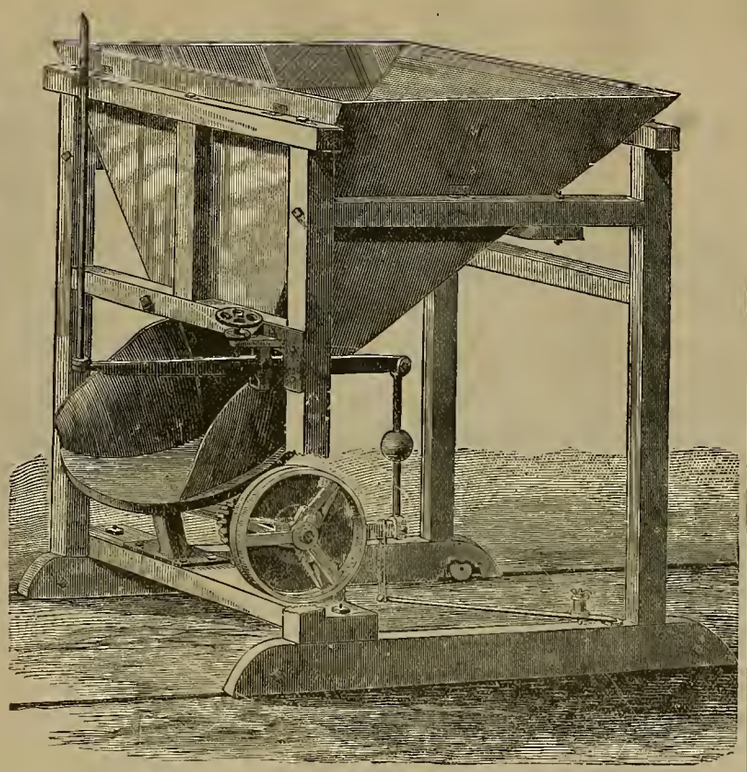
OVER 800 ARE NOW IN USE, GIVING ENTIRE SATISFACTION.

Awarded First Premium at the Tenth and Twelfth Industrial Fairs of the Mechanics' Institute.

Twenty Per Cent. More Ore Crushed with Fifteen Per Cent. Less Wear of Iron than by Hand Feeding.

The accompanying cut illustrates the recently introduced Grip, and also the Spring Attachment, which replaces the Weight berctofore used, and which are obvious improvements.

It is now fully demonstrated, after careful and long continued experimentation and practical use, that the plan upon which a perfect Ore Feeder must be constructed is that of a carrier, and not that of a shaking-table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Jerky or spasmodic contrivances will not answer the purpose for wet or sticky ores.



The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20 Stamp	Tuolumne county, Cal.	
Sheep-Ranch	20 "	Calaveras "	"
Mahoney	40 "	Amador "	"
Zelle	40 "	"	"
Placerville	40 "	El Dorado "	"
Gross	80 "	" "	"
Julian	20 "	Placer "	"
St. Patrick	15 "	" "	"
Providence	20 "	Nevada "	"
Omaha	10 "	" "	"
Green Mountain	60 "	Plumas "	"
Plumas Eureka	60 "	" "	"
Bulwer-Standard	30 "	Bodie Dis., Mono.	"
Standard	20 "	" "	"
Noonday	30 "	" "	"
Bodie	10 "	" "	"
Christy	5 "	Uintah Co., Utah.	
Ontario	40 "	Parley's Park, "	
Contention	20 "	Tombstone Dis, Arizona	
Grand Central	20 "	"	"
Harshaw	20 "	Patagonia,	"
Snusbiue	20 "	Idaho Springs, Col.	
Homestake	200 "	Black Hills, Dakota.	
Father De Smet	80 "	" "	
Hidden Treasure	40 "	" "	

Superiority of the "Challenge" Ore Feeder Demonstrated!

At the "Christy" Mill, Uintah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "Eclipse."

The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted.

The "Silver King," Mill of Arizona, also removed the "Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill, of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.

JOSHUA HENDY, Agent,

Machine Works, 49 and 51 Fremont Street, San Francisco.

Manufacturer of Quartz, Saw Mill and General Machinery. Also Agent for BAKER ROTARY PRESSURE BLOWERS, and WILBRAHAM ROTARY PISTON PUMPS. P. BLAISDELL & CO.'S Machinists' Tools. HOT POLISHED SHAFTING from the Akron Iron Company, of Akron, Ohio.

Dealer in New and Second Hand Engines, Boilers, and all Descriptions of Machinery.

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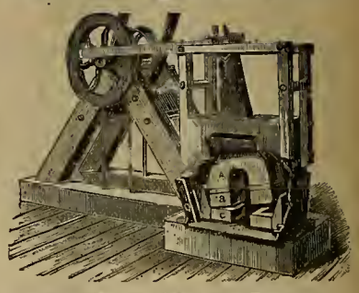
HUNTINGTON'S
Oscillating Stamp Mill



It has no Steme, Came, or Tappete, and Adjusts Itself to the Wear of the Shoes and Dies.

For Simplicity, Economy, Durability and Effective Working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power.

Awarded First Premium and Medal at Mechanics' Fair, San Francisco, 1880.

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Engine and Boiler for Sale.

Ten by Twenty inch Engine, Ryder Cut-off, Corliss bed, made by Ætna Iron Works, 30-horse power complete with Steam Feed Pump, **$1,250.**

Twelve-foot Cornish Return flue, 50 inch Boiler, 27 inch flue and 50, 2½-inch tubes, 8 feet long. All complete with 15 feet, 20-inch stack, **$800.**

They have been in use not over 4 months and will be sold complete with all connections for, **$2,000.**

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STROUDSBURG, MONROE COUNTY, PA.

Orders may be addressed to us at any of the following places at each of which we carry a stock.

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Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

HIGHEST PRICE PAID FOR SCRAP IRON.

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TONITE.

Miners! Attention!

With the approach of winter, the dangers which attend the handling and use of all Giant Powders (Nitro-Glycerine mixtures) are increased.

The lives annually sacrificed in thawing or using frozen cartridges, should be a warning to all to abandon Powders which freeze at 42° Fahrenheit. All Nitro-Glycerine Powders freeze at that temperature, and now for the first time Miners on this Coast have an opportunity to AVOID THESE DANGERS.

TONITE NEVER FREEZES!

NOR IS THERE ANY LIQUID SUBSTANCE IN IT TO LEAK OUT.

It is Always Ready for Use, as well in the Coldest Regions as the Tropics.

☞ Miners are cautioned to take no stock in the slanderous reports about TONITE circulated anonymously or otherwise by the Giant Powder Company. They are all untrue.

TONITE POWDER COMPANY,
218 California street, S. F.

WHEELOCK AUTOMATIC CUT-OFF ENGINE

INDORSED BY THE MOST EMINENT ENGINEERS OF THE COUNTRY AS THE MOST ECONOMICAL AND PERFECT WORKING ENGINE NOW MADE AND THE BEST PIECE OF STEAM MACHINERY THE MECHANICAL INGENUITY OF THE TIMES HAS YET PRODUCED. CAN BE SEEN IN OPERATION AT THE PACIFIC IRON WORKS, RANKIN, BRAYTON & CO., SAN FRANCISCO. SEND FOR CIRCULAR.

WIND MILL. One of the best made in this State for sale cheap on easy terms. Address, W. T., care of Dewey & Co., S. F.

BOOKS, Relating to Casting and Founding, Electricity, Electric Light, Engineering, Drawing, Manufacture of Gas, Heat, Indicator Diagram, Link Motion, Mechanics, Screw Cutting, Steam Boilers, Steam Engines, Steel Turning Wire Gauge, Worksbop Receipts. Descriptive Catalogue sent on application.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, SEPTEMBER 24, 1881.

VOLUME XLIII Number 13

Academy of Sciences.

The regular semi-monthly meeting of the Academy of Sciences was held on Monday evening, Vice-President J. P. Moore in the chair. Donations to the museum were as follows: Mr. Frank Miller, two specimens of the blind fish of the Mammoth cave, Ky., known as *Typhlicthys Subterraneus*; also two specimens of crustaceans from the same locality. From A. B. Stout, specimen of *Squiller maculatus*. From S. S. Montague, specimen of the *Mylolencus pulverulentus*. This is a fish found in the waters of certain warm springs in Nevada. A peculiarity is that these springs occasionally dry up. The fish has a speckled or "powdered" appearance. From John A. Palmer, of Carlin, Nevada, specimens of plants used by the Shoshone Indians for making ropes and nets; there are the *Asclepias erosa*, (Torr.) and the *Apocynum cannabinum*, (Linn.) Mr. Moore said in this connection that he had recently been investigating the fiber plants used by Indians in Arizona. He found some which might be used for making paper. An instrument was also presented, such as is used by the Shoshone Indians in dressing and tanning skins.

The donations to the mineralogical department were as follows: From H. M. Bennett, specimens of nitrate of soda from Oxford, Oneida county, Idaho; from Chas. Wolcott Brooks, clay found on railroad, Sonoma county, near Petaluma; from C. D. Gibbs, seven specimens of white rock, containing sulphurets of iron, from railroad cut near Sydney, Australia.

A new work was received from Mr. Gustav Eisen, of Fresno county, describing and delineating a curious earth worm found by him in the high Sierra. Dr. Eison has prepared a very elaborate work on the subject of "Earth Worms." This will be a quarto volume of some 300 pages, freely illustrated.

Dr. Hermann Behr read a paper on "Insecticides." In this paper he took the ground that bi-sulphide of carbon was injurious to plant life, and not necessarily fatal to insects. He maintained that the pulverized leaves of certain plants were more effective in killing insects; and that oily or fatty substances were preferable to any evaporating fluids.

Mr. J. P. Moore concurred in the views expressed by Dr. Behr. He had, while trying to kill gophers, noticed the effects on certain plants. He then applied the bi-sulphide in small quantities to certain plants. The first effects were to quicken the life of the plants, but the subsequent action was insidious, as Dr. Behr had stated. Before fall those plants that were not treated were vigorous, while those that were treated were dead. These same effects were found in experimenting on rose bushes.

Dr. Stout called attention to the danger attending the use of bi-sulphide, but thought it depended a good deal on how it was used. Was good in many instances.

Mr. J. P. Moore had, at the previous meeting, commenced a series of papers on certain diseases of the vine caused by fungi. The first paper was on the structure and growth of parasitic fungi. At the last meeting, Mr. Moore continued the subject, taking up some special forms and giving the proper method of exterminating them. Mr. Moore intends taking up other vine and fruit diseases in future papers.

Dr. Behr spoke of the reason why these fungus pests so suddenly increased. He said our tarweeds and other resinous plants had formerly protected us from them to a great extent. But now these tarweeds were destroyed to be got rid of, and they no longer protect us.

Mr. Rixford said vine cuttings were cut up and plowed in for fertilizers, usually in this country. It would be had to have to burn them. He thought also that tarweed was increasing and not decreasing, at least, in Sonoma county. If some one could find a way of utilizing tarweed they would be doing a good thing.

Mr. Moore said, as a general thing, fungoid growths do not attach themselves to plants having odors, and plants like tarweed are so strong that fungoid growths do not flourish on them.

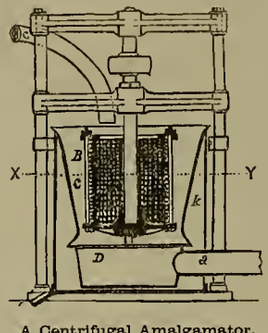
Mr. Chas. Wolcott Brooks reminded the Academy that he had read before it, a paper on the early discoveries on the Hawaiian Islands. Since that paper was published he had received confirmation of the views expressed. He described at length two carved stone images composed of lava, each about three ft. high, recently brought to this city by Mr. J. C. Pflugger, from the Hawaiian Islands, now on their way to the Imperial Museum at Berlin, Germany. Both were well carved with iron instruments, and are said to be two or three centuries older than the first visit of the great navigator, Capt. Cook, to those islands. They are thought to be highly corroborative of the early visits and discoveries of the Spanish navigators to the Hawaiian Islands in 1452, as shown by the old Spanish records. One image represents a Spanish cavalier, with Spanish features and dress, and has a large, fluted, old-style ruffle around the neck. Both are carved with iron tools, such as Capt. Cook found among the natives upon his first visit, and which fact clearly proves that some foreigners had been there before, for no mineral formation in any part of the group shows any traces of iron. It must have been imported.

Mr. Brooks announced that he had heard from Europe of the reception by Capt. Dallmann, of the Academy proceedings containing the inquiry regarding early discoveries of Wrangel Land. Capt. Dallmann, who was in command of a steamer on the coast of Norway, said he would explain his claim some time next year, after his return from a voyage to Siberia.

At this point of the proceedings a dispatch was handed to and read by the Chairman, announcing the death of the President of the United States, and the Academy immediately adjourned.

THE Tombstone *Epitaph* says: "The mining outlook for Sonora is particularly good at present. The short-sighted policy of the Mexican Government in placing such a heavy tariff on machinery, lumber, etc., amounts almost to an embargo on mining developments. Even the bullion cannot be exported without paying a heavy duty. This policy is driving away capitalists, and will work great injury to the speedy development of that country and prove a failure as a source of revenue."

CAPT. EADS is greatly encouraged over the prospects of his marine railway across the Isthmus of Tehauntepec. "My plans," he said,



A Centrifugal Amalgamator.

"have been indorsed by the most eminent engineers in Great Britain, and I have been offered all the capital I need, but I decline to accept the offer, as the scheme is distinctly American, and I want all the privileges and benefits to be derived to fall to my own country. The only consideration asked from thie government is to guarantee for 15 years at 6% dividends on $50,000,000 of stock."

THE OLD MISSION OF SAN LUIS OBISPO.

SEARCHING MINERS.—The miners employed in the Sierra Nevada and Union Consolidated mines, in the neighborhood of the reported ore strikes, are searched as they leave the mines, and have been for the past week. Whether it is being done simply as a "bull" movement, or from a real desire to keep a knowledge of the present condition of the mines from the public, it is hard to determine.

THERE is some inquiry in Utah for desirable mining property in districts close to Salt Lake.

San Luis Obispo Mission.

The early Catholic fathers who established the first civilized settlements in California, having plenty of time before them, with no railroads, telegraphs, expresses or mails, to hurry them up, took their time in selecting the sites upon which to build their missions. That they exercised care and judgment in the selection is manifest from the fact that to-day the remaining missions are centered in localities where climate is good, soil is excellent, and the surroundings are pleasant.

The early missions formed centers around which gathered the people of the country. Near by they cultivated small patches of ground or tended their flocks and herds. The missions were more numerous in the southern part of the State, and wherever the sites were, there would be formed inviting surroundings, and advantageous topographical features for such centers.

The padres were well aware of the advantages of the sea ports, and established missions at San Diego, Los Angeles, Santa Barbara, San Luis Obispo, Monterey and San Francisco. In some cases, as at Los Angeles and San Luis Obispo, the locations near the ocean not being agreeable, they wisely put their buildings back from the sea, but still near enough to reap the advantage from proximity to a sea port.

The style of all their buildings was the same; plain adobe structures, with red baked tile roofs, and a surrounding veranda, the church roof being higher than the other one-story buildings, and having a walled enclosure attached to it. The engraving shown herewith, representing the San Luis Obispo Mission, will give a good idea of the style of building. San Luis Obispo is nine miles from the harbor, and is connected by railroad. The place has much the appearance of the old Mexican towns, the old cathedral and many other adobe houses still standing. It is the center of a wool and wheat country and is now one of our thriving towns, being the only one of any size between Monterey and Santa Barbara. A great many native Californians still live in the vicinity of San Luis Obispo, and perhaps there is no better town in the State to study the types of the race.

A New Amalgamator.

Mr. P. B. Wilson, of Baltimore, Maryland, has adapted a centrifugal machine to the evaporation of the precious metals from pulp, which, briefly stated, consists in the interposition between the basket and center of the machine of an amalgamated plate, adapted to receive the contents of the revoluble basket as they are thrown off by centrifugal force.

The centrifugal machine consists of an outer casing, inside of which is the revoluble basket, which is driven in the usual way. *C* is the amalgamated plate preferably made in sections which is placed inside the casing and around the basket. The lower edge of the plate, *C*, extends below the basket, *B*, and is flared outwardly, as shown.

D, is a pan located at the bottom of the casing into which the refuse material falls, and it is furnished with an outlet pipe, *a*. The casing, *A*, is provided with a delivery pipe, *b*, for the amalgam.

The water, or the water, sand and pulp, are introduced into the revoluble basket by means of a trough or pipe, *c*, and projected from the basket by centrifugal force against the amalgamated plate, *C*, which retains the gold, the the refuse material falling to the pan, *D*. By flaring the lower edge of the plate, *C*, the amalgam is conducted past the edge of the pan, *D*, to the bottom of the casing.

THE Silver Reef *Miner*, a well conducted local paper, published at Silver Reef, Utah, has entered on its fourth volume, and donned a new dress. The *Miner* very sensibly pays close attention to local affairs and we are always sure of fresh items from it for our "Mining Summary."

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

The Mining Interest in New York.

[From Our Regular Correspondent.]

EDITORS PRESS:—The transactions at the mining boards of this city have been unusually large, with fluctuations of considerable extent. There seems to be nothing to cause the unwonted activity beyond the mere manipulations of the various cliques controlling the market. This in itself appears, to the outside speculators, sufficient reason for the sudden movements which have been made; and it is to be feared that these artificial causes for activity are beginning to be regarded as the mainstay of business rather than actual changes in the condition of the mines themselves.

Several of the wildcat stocks which have lately been placed upon the market seem to have been taken up to a large extent by the public; and their original holstering having been knocked from under them, the natural decline has occurred.

I notice that one of the newspapers making a business of puffing (for a consideration, of course) various worthless securities argues "it is getting to be a well-known fact that the men who make the most money in mining stocks are those who get in on the ground floor, in other words, buy the treasury stock at the company's office before the mine is fully developed or listed on any of the exchanges." And then follows the customary admonition: "People who are looking for such opportunities will do well to read the advertisement in this paper of the ——;" but it would be personal to mention names. This plan, however, is found by the unwary investor not to work quite so well in practice as in theory, for the insiders having sold out, there is nobody left with an interest in keeping the stock at fictitious figures. I wonder whether these innocent New Yorkers ever will learn that really good and valuable mining properties do not go begging, here or elsewhere, for want of buyers, any more than do meritorious enterprises of any other kind. There are always men with money on the watch for anything out of which more money can be made. It is only a confession of worthlessness when the dear public are invited to step up and share the good things.

Mining Items.

Articles of incorporation have been filed at Albany, of the Hamilton (Nevada) Mining Company, capital, $2,500,000; Silver Belt Company, $2,500,000; Bright Star Mining Company, capital, $2,000,000. The Eagle River Consolidated Mining Company has reduced its capital stock to $5,000,000.

The Carihou Company received, as the latest shipment, 4,055 ounces of bullion, valued at $4,700.

The Gold Stripe trustees will push further development on the mine.

The Ontario's product for 23 days of August was $151,182, assay value.

It is said that extensive reductiou works will at one be erected in the Burro mountains, New Mexico.

The Leadville *Democrat* is still loud in its praises of the Chrysolite, while the *Herald* insists that the mine is being gutted.

During the week ending August 27th, the sales at the American Mining Exchange aggregated 195,380 shares, and at the New York Mining Exchange, 517,325 shares, making a total of 712,705 shares for the two Boards in this city. Of this what proportion were wash sales and how much represented real transactions, I am unable to say. PAUL WARD.

New York, Sept. 8, 1881.

Public Lands and Mines.

EDITORS PRESS:—The importance of procuring Government title to lands, and the mode of doing so, has been one of considerable moment and some conflicting opinions. For a long time our opinion has been adverse to the law of Congress regulating the title to mines and mineral lands. Under the present laws all the public lands are being surveyed, under instructions, as we believe, that land containing minerals shall be so marked upon township plots. The law also permits homestead claims to be made to 160 acres, which has been and is being done all over the country, even where it is known to be mineral; and unless protest is made, they will no doubt be granted patents.

The law also authorizes the taking of surface mining claims by the acre in lots, and the locating of ledges of mineral-bearing rock to the amount of 1,500 ft. in length. After doing a certain amount of work—$500—be can procure a patent. Now it will be observed that there is no restriction as to number of claims each individual may take up or purchase. Hence, it will be seen that the moneyed men are busy acquiring titles to all the mines, and as soon as a patent is obtained, he may do no more work but lay them aside for future use, as interest may suggest.

This practice if continued will in 20 years as effectually lock up the mines from the poor prospector as is the case now in Georgia or any of the old States. It is even said now that the people on the line of the C. P. R. R. will not protest to the railroad company getting patents on the mineral lands in their grant, as they then will be able to compromise and get the said lands for less than they could under the mineral laws of Congress. Almost every acre of land in California, in the mineral belt, is truely mineral land, and should be held open to the free mining and prospecting.

The law of locating and owning should be so amended as to limit the number of claims or feet to any one man or company, and if not worked in some proper way within a certain time, to work a forfeiture to the Government.

AN AMERICAN MINER.

Reporting Mining Information.

When a man has but little, his general disposition is to make it appear that he is pretty well fixed. When he has much, he becomes indifferent as to appearances, or as to what others think of his circumstances. With miners this same characteristic is even stronger. When a miner finds a ledge he talks as though he was independent. When he gets a small hole in the ground, he considers his prospects first-rate and is glad to have the reporter visit him and write up his claim, but when he strikes the real stuff itself, and his mine is paying big, he suddenly becomes indifferent, and about all the reporter can then get out of him is: "Oh, yes, we are taking out a little gold, but expenses are very heavy;" or, "we are doing pretty well, but don't want anything said about it." Our experience is and has been that the man who has got but little of substantial interest to report is free with his information, while the man who could furnish an item of solid merit that would really help the district generally keeps clear of the reporter, and has but little to say when found and run down. Of course to this, as all other rules, there are exceptions, but the exceptions are not common. There are mines being worked in this part of the country now that if the truth were told of them would make a good showing, but the exact truth is difficulty to obtain. We may say "we hear" so and so, but that is not just exactly the kind of information that does the most good. Mine owners and mining superintendents could assist the publisher very materially in overcoming this difficulty if disposed to do so, and publishers would be pleased if they would. For our part we shall always be glad to know what they are doing. If their work, however, is "dead work," let them say so, and leave speculation as to what they expect out of the report. It is no discredit to a mine that a certain amount of "dead-work" has to be done on it. In all cases more or less is necessary. If they are taking out ore let them say so, and if they are crushing let them tell frankly whether it pays or whether it don't. Such mining information, reliably reported, will be read and carefully considered, and would do good. Generalities have but little weight.—*Placer Herald.*

Work Necessary to Hold a Claim.

The statute requires $100 worth of work on each claim located after May 10th, 1875, in each year, and in default thereof, authorizes the claim to be relocated by other parties, provided the first locator has not resumed work upon it. But if the first locator resumes at any time after the expiration of the year, and before any relocation is made, he thereby preserves his claim: the statute nowhere authorizes a trespass upon, or a relocation of a claim before located by another, however derelict in performing the required work the first locator may have been, provided he has returned and resumed work, and is actually engaged in developing his claim at the time the second locator enters and attempts to secure the claim.

Where one person or company owns several contiguous claims, capable of being advantageously worked together, one general system may be adopted to work such claims; and work done according to such system for the purpose of prospecting or working all such contiguous claims, although done on only one of such claims, even outside of all of them, is available to hold all such contiguous claims intended to be worked or prospected by such general system.

TIOGA DISTRICT.—This district is situated on the division line between Mono and Tuolumne counties, and its altitude is about 11,000 ft. It is on a rich mineral belt, which may be said to be in the heart of the Sierras. The scenery is grand, and at this season it is a delightful place, there being scattered about in the laps of the mountains a great number of little lakes, which are perfect amethystine gems. About Dana are some rich mines. The Great Sierra, on Tioga hill, shows a vein 6 ft. wide, on which a shaft is down 70 ft. It shows ore rich in silver. The Bevans, Sheepherder, and other mines owned and worked by Eastern capitalists are silver veins of a formation resembling the Comstock. The Bevans mine, to the north, and the Great Sierra are reached by mountain trails, which in places approach so near to the perpendicular that travelers are obliged to dismount and lead the horses and mules over them. Here found plenty of last year's—or perhaps everlasting—snow. This region has a population of about 100 persons at present.

THE Bonanza drift mine at Howland Flat, Sierra county, is paying $5,000 net per month.

Railway Progress.

There has been an unparalleled degree of activity manifested in railway construction in this country during the past decade, and at no period during that time has the increase been so great as in 1880. By decades the progress, since 1830, when there were but 23 miles in operation, is summed up as follows:

From 1830 to 1840	2,785	miles
" 1840 " 1850	6,213	"
" 1850 " 1860	21,614	"
" 1860 " 1870	22,279	"
" 1870 " 1880	40,757	"

The gross earnings per mile, which decreased continuously from 1871 down to 1878, made very little gain from the lowest point in 1879, but in 1880 leaped up at once, becoming the largest for six years. Expenses made a similar leap, yet not so far but that net earnings per mile were the largest since 1871. The average net earnings for 1880 was 5%, which is as good an average as is usually made by railroads passing through the densest populated portions of Europe.

That the impetus of railway progress for 1880 has not yet begun to decline may be inferred from the fact that 61 new railway companies have been organized in Indiana since January 1st, or more than three times the number incorporated the same time the previous year. This may be a somewhat large average for the whole country; but from information gathered from a large number of States, it is quite certain that the mileage of new track already completed and to be constructed during the year, promises to be much larger than even that of 1880.

Marking Locations.

A location of a mining claim must be distinctly marked on the ground so that its *boundaries* can be readily traced; but the law does not define, or prescribe, what kind of marks shall be made; or upon what part of the ground or claim they shall be placed. Any marking on the ground claimed, by stakes, mounds and written notices, whereby the *boundaries* be readily traced, is sufficient.

A subsequent locator has no right to object that the first location was not sufficiently marked on the ground at the time of the location, or before recording, provided that such first location was sufficiently marked on the ground before any valid subsequent location of the same claim.

After a location has been lawfully made, the right of the locator cannot be divested by the mere obliteration of the marks or the removal of the stakes without his fault, he having performed the other acts required by the statute.

MILL CREEK—LUNDY.—The population is about 400 souls, including 125 men employed at the May Lundy mine and mill. The town is delightfully situated, and is growing rapidly. New buildings are going up in all parts of the place. The town is a green valley between high mountains, and near it is a fine little lake. There is here a rich gold belt, and new discoveries are frequently made. The claims that are being worked are held at high figures, and quite a number are bonded to Eastern people. Several claims are being worked by "high privates." Not a few Eastern experts are now scouting about in this region. The following mines are being worked: May Lundy, Gorilla, Woodland, Nioma, Bryant, Kearsarge, Pike Tunnel, Curry and Homer. The following claims are being prospected: Prussia, Good Hope, Adelaide, Erie, Yellow Rose, Little Emma, Gold Bar, Gold Feather, Monitor and Northern Belle. Also several mines on Mount Scowden (which, from its shape, should be called Cathedral mountain), are being worked.

OTHER VEINS THAN THOSE DISCOVERED.—Where a valid location is made upon a vein or lode discovered, the locator is not only entitled to the vein discovered, but to every other vein or lode throughout its entire depth, the top or apex of which lies within the surface lines of the claim extending vertically downwards, to which no right had attached in favor of other parties at the time the location became valid, although such veins or lodes may so far part from a perpendicular as to extend outside of the vertical side lines.

BODIE MILLS.—At Bodie the following mills are at work: Minere' mill, working Bodie Tunnel ore; Bodie, working Bodie ore; old Standard mill, Standard ore; Bulwer-Standard, Standard ore, Noonday mill, Bechtel ore; Syndicate mill, Syndicate ore. All these mills represent about 125 stamps. The Silver Hill and Spaulding mills are not now running.

MINERS' RULES MUST BE IN FORCE.—To be of any validity, a rule or custom of miners must not only be established or enacted, but must be *in force* at the time and place of the location. It ceases to be operative whenever it falls into disuse, or is generally disregarded.

A MR. LYON has purchased of Messrs. Gross, Pierce and Buckingham their recent quartz discovery near Pleasant Valley, El Dorado county. The purchase price is said to have been $22,500; $5,900 down, and the balance in deferred payments.

THE farmers of Antelope valley are in the midst of a copper craze that promises to be of substantial benefit to that portion of Mono county.

Old Humboldt District.

A correspondent of the *Silver State* says: As there has been so many inquiries of late relative to the mining revival at this place, perhaps it may be interesting to your readers to receive information direct on the subject. Since last June everything has been very lively in the mines, and the prospects are good for Old Humboldt district to become as good a mining camp as any in the State. Judge Barbee, of Utah, is largely interested in the mines of the reorganized district. He has a large force of men at work on several claims, and thus far has been very successful in finding rich ore and developing fine-looking mines. Ore from the ledge in a tunnel 125 ft. long assays $1,500 in gold and silver to the ton, while ore from a shaft 25 ft. deep on the same ledge assays $1,800 per ton in silver. Assays from the croppings of other locations run as high as $2,000 and $3,000 per ton, and there is every indication of the permanency of the veins. In one of the mines now being developed there is plenty of ore in sight, and there is every reason for believing that the district will prove equal to any in the State. This fall Judge Barbee will erect reduction works, and reduce the ores now being extracted from his mines. He is confident of success, and says he has seen no better prospects anywhere. The Royal Con. M. Co., of New York, have bought property in the district, and intend to commence operations at once, and erect a mill shortly. This company, of which Judge G. T. Sewall, well-known to old residents of the county, is superintendent, are operating in Colorado and Arizona with marked success, and they propose engaging extensively in mining here. Assays from the croppings of several ledges belonging to this company range from $500 to $2,000 in silver to the ton. With the present prospects, I think it can be safely said that the outlook for this district is as bright as any in the country.

SWEETWATER.—The Bodie *Free Press* says: Considerable excitement was created in town Wednesday by the reported rich strike in one of the Sweetwater mines. Upon inquiry it was learned that Dr. Summers had on exhibition in Boone & Wright's store some good looking rock taken from his claim in Patterson district. The ore was taken out of a large ledge, and proves to be rich in silver. The ledge formation is said to be almost 20 ft. wide. The Doctor and his friends are confident that they have a mine. Martin Jones came in Wednesday evening from the district and is perfectly satisfied with the outlook. He is interested in a claim called the Great Western. So far it shows up well. All those operating in that section speak in glowing terms of the outlook. The formation is good and it bes every indication of being permanent. The discovery made by Dr. Summers is of great value to the district.

SEWING MACHINE NEEDLES.—The single town of Brockton, Mass., now manufactures more sewing machine needles than all of Europe combined. They are turned out by the million and shipped all over the world. The needle, of the best steel, passes through 30 different hands in the manufacture before leaving the factory; it is of various sizes and shapes, curved, straight, two-eyed (twin holes), and the cheapest costs three-quarters of a cent.

CLASSIFICATION OF CALIFORNIA INDUSTRIES.—A general classification of the population of the State of California as to industries is set down as follows:

Commercial towns	268,609
Agricultural towns	92,017
Mining towns	36,701
Mixed industries	45,214
Farm, mine and hamlet	427,415
Total	864,636

A FRENCH journal the other day published a table showing that the average wages in 51 distinct trades were only 60½ cts. a day, or $3 63 a week. These were the wages of men. For women the average in 11 trades is 31½ cts. a day, or $1.87½ a week. Decorative sculptors, a class of highly skilled and intelligent workmen, receive only 62½ cts. a day.

THE Nevada *Transcript* is 21 years old. We are always sure in picking up this exchange to find something of interest, as it pays close attention to local affairs, and its mining items show care and intelligence in their preparation. The paper has just attained its majority and we hope to be able to congratulate it at the end of another 21 years.

IT is reported that in the region of Rock creek, north of Auburn, there is being experienced quite a mining boom. Machinery is being hauled out that way, and arrangements are making for commencing operations on several ledges that for some time have remained comparatively idle.

THE Salt Lake *Tribune* says: Parties who have recently visited Pinon hill report the ore bodies in sight in the Climax and Rebellion as simply immense. If that hill was worked for all there is in it, employment would be given to hundreds of miners and the Park would rival Leadville.

FOR CHURCH BUILDING.—It is said by Lord Shaftsbury that not less than $180,000,000 have been spent in England for church building during the present century.

MECHANICAL PROGRESS.

Floor Building.

So few of the floors constructed in new houses are, says the *Building News*, equal to their work, that the attention of architects and builders might be profitably called to the subject. In going over some of the newly-erected houses in the suburbs of London, it is not infrequent that one finds dwelling house floors which have sunken so much in the center as to destroy the comfortable assurance that they are safe. These instances occur chiefly in houses erected by speculative builders, who seem to be under no regulation of any kind in respect of floor timbers. * * * Many practical builders have a conviction that if a timber as a joist has a larger cross section than another it must be stronger. Thus they fancy a piece of timber 8 inches by 3 inches, which equals 24 square inches in sectional area, cannot be so strong as a piece 5 inches by 6 inches which has 30 inches in area. The fact is, the smaller piece is the strongest of the two if both are placed upon edge, as every one knows who has studied the principles on which the strength of beams depends. It is easy to convince the most practical of this seemingly inexplicable fact. If two beams of like size are placed side by side, the two will resist twice the amount of one of the pieces. This is so self-evident that experiment is not needed to establish the fact; in the same way, three beams will resist three times as much as one, and so on of any number. In plain English, when lengths and depths are equal, a beam of six inches in breadth will bear three times as much as one of two inches in breadth. It may be shown by experiment quite as readily that the strength increases more rapidly with the depth. In point of fact, another law of proportion is observed—namely, that having two beams of the same breadth and length but of different depth, the strength increases more rapidly than the depth; thus it is found a beam nine inches deep bears more than three times as much as one only three inches deep. These are very simple statements derived from facts and experiments and no complex conception of the resistance of certain fibers on both sides of a neutral axis, or quotations in algebra, are required to establish them.

In dwellings the load on a floor is chiefly made up of furniture, though this is generally placed, at least the heavier articles, round the walls of rooms. The space occupied by tables and other objects in the center of a room reduces the available standing area, and thus, for all ordinary floors, 70 lbs. per superficial foot may be calculated for as the full load in extreme cases. Rules founded upon the resistance of beams to rupture are, however, of little use, as the floors may be seriously affected by deflection, and deflection is directly as the cube of the length. In regarding stiffness, the load per foot has been given by one authority as 90 lbs. per foot, including weight of materials. It makes all the difference to place joists an inch nearer, though builders like to give as much interval as they can, for economy's sake. Instead of joists being placed 12 inches apart, it is often-er to find them 13 inches or even 14 inches, and the consequence is a scantling which has been found to answer in a well-built house fails when it is introduced with a greater distance or interval. Then the modern speculative builder's floor is seldom properly stiffened by cross bridging. There is only one row instead of two or more. Of course no practical man will deny the advantage of bridging his floor joists. It helps wonderfully to prevent deflection under a concentrated load, for the joist immediately beneath the load is relieved of direct strain, and the joists on each side take a share of the weight. Generally it may be taken that a properly bridged floor is capable of sustaining, without mere deflection, twice as much load as the same floor without bridging, so that the cost of the introduction is amply repaid.

Discarded Experiments.

A very bright mechanic was telling, a few days ago, how he constructed an improvement that promises to be of some future use and profit hereafter, from castaway "contraptions" found in the "glory-hole" of the establishment in which he is employed. From his partial enumeration of the contrivances and their parts he found in the unused attic is evident that the proprietors have suffered some considerable loss from uncompleted experiments, in material and waste of time of hands. It is a little singular that in taking account of stock these wastes do not figure in the inventory. It is certain they represent time, and labor, and material—and dollars. And as such representatives they ought to be reckoned, for the benefit of proprietors and stockholders. Somebody must pay for this work and this thrownaway trash, as it all costs. How much of the cost comes direct upon the owners and stockholders perhaps nobody knows; and how much of the results might be utilized nobody seems to care. It would seem to be good policy to make an overhauling of "glory holes" once a year, and when the contents are condemned by proper authority, like a State or national commission, have them sold "to the highest bidder."

This, however, would be a rough and perhaps injudicious method of getting rid of what is not presently valuable, and by exposing the skeleton in the closet of the company. It might be better to have a private, occasional overhauling by judicious workmen and a selection of refuse that might be worked up into useful material or possible machines.

"Out of sight, out of mind" is an old saying, and some of the attempts that illustrated the hard struggles of inventors are forgotten because they have been put away out of sight. And yet there are forgotten contrivances in many old established shops that would suggest and aid present mechanics and future inventors, if they could have access to them. In some of these old establishments the writer has found the neglected embryo of improvements that have brought name and money to the enterprising re-inventor and perfector. Not long ago, in rummaging over an unused attic in an establishment of more than 30 years ago, was found a complete model of a contrivance now in successful and profitable operation, that has made money for its patentee, and yet he did not steal the idea; he merely re-invented it, without a knowledge of the work of his predecessor, who was too lax to use his discovery profitably, or was deterred from business attempt by discouraging counsel. It may pay to look after the future of discarded experiments.—*Boston Journal of Commerce.*

Mechanical Terms.

The technical terms which are in use do not seem to be generally comprehended by the majority of our mechanics and engineers, from the fact that a large number of terms are in use which mean one and the same thing.

The distinction particularly between the terms force, power and work, is not clearly understood.

Dynamics is the science of that branch of mechanics which treats of force in motion, power and work. It comprehends the action of all kinds of machines, manual and animal labor, in transformation of physical work.

Element is an essential principle which can not be resolved into two or more different principles. The simple physical elements of dynamics are force, velocity and time, and the functions of those elements are power, space and work.

Function is any compound result or product of two or more different elements.

A function is resolved by dividing it with one or more of its elements.

Force is any action which can be expressed simply by weight, and which can be realized only by an equal amount of reaction, and is the first element in dynamics.

All bodies in nature possess the incessant virtues of attracting and repelling one another, which action is recognized as force.

Velocity is speed or rate of motion, and is the second element in dynamics.

Time implies a continuous perception, recognized as duration, or that measured by a clock, and is the third element in dynamics.

Power is the product of force and velocity; that is to say, a force multiplied by the velocity with which it is acting is the power in operation. Power is the differential of work or any action which produces work, whether mental or physical. Power multiplied by the time of action is work—work divided by time is power.

Work is the product obtained by multiplying together the three simple elements force, velocity and time.—*American Machinist.*

COTTON DUCK FOR ROOFING PURPOSES.—The use of cotton duck for roofing purposes is exciting a good deal of interest among agents of cotton mills now building. The Lawrence Duck Company, Lawrence, have one-half of one of their mills roofed with duck, and though over a year since it was put on, it now appears as good as new. The Pacific Mills have also tested it with the most satisfactory results. These two roofs have been examined recently by experts, who found the material to have retained its bright appearance without any deterioration or apparent injury to the fiber. The Globe Yarn Mills, Fall River, have adopted it for their new mill, and it is also in use by some few other companies. It will be to the interest of cotton manufacturers to give this material a thorough trial, as the success of it would give new life to the cotton manufacturing business and open up, at home, a demand almost without a limit, and quiet the fears of those who are alarmed at the thought of over-prodoction and the necessity for more extended foreign markets for cotton goods.

GENERAL PATTERSON ON AMERICAN MACHINERY.—In a recent letter, General Patterson, of Philadelphia, recently deceased, said: The Americans make the best machinery to be found anywhere. I have sold all the English machinery in my several mills for what I could get, and have replaced it with the product of the Brideshurg (Pennsylvania) Manufacturing Company, and in consequence have saved as much from the increased production and improved quality of the same as the new machinery cost. I now have all my mills in perfect running order, but I pity the men who bought the English machinery. There is no State in this country more interested in the protection of American machinery and American industries of all kinds than Georgia; next to Georgia come Alabama and Tennessee with cotton, iron ore, and coal in the greatest abundance, a good climate, and water power sufficient to run any amount of machinery.

SCIENTIFIC PROGRESS.

Mechanics in Surgery.

Dr. W. G. A. Bonwill, of Philadelphia, has recently invented and put in actual practice, a mechanical appliance for superseding the use of hand tools in surgery. Although this is not the first instance of the introduction of the higher refinements of mechanics into the practice of surgery, it is nevertheless quite a step in advance, both in the comprehensiveness of the machinery and its varied applications, over anything which has preceded it.

The apparatus has been for some time in use in several of our principal Eastern cities, where it is received with much favor by leading surgeons. Quite recently it has been brought to the attention of English surgeons, at the session of a Medical Congress, where it has been described and commented upon as follows:

"Our American friends have always been foremost in devising mechanical appliances for superseding manual labor, and Dr. Bonwill's is the latest which has been brought under our notice. Besides saving labor, the present machine tends to redeem from something of barbarism certain surgical operations, particularly amputations. As well as being the latest addition to the list of labor-saving appliances, it is, perhaps, the most startling, inasmuch as the amputation of a limb may now be effected by the aid of machinery, just as conveniently as hair-brushing is.

"The surgical engine of Dr. Bonwill consists of an iron standard carrying an arrangement of multiplying wheel gear, which, by means of an endless cord passing over pulleys, transmits rapid rotary motion to either small drills or very fine circular saws, as the case may be. These instruments are attached to the end of a series of rods connected by universal joints, which permit the operator to move the cutting instrument in any direction he pleases while it is revolving at an incredibly high speed. It will, of course, be understood that these instruments are intended to deal only with bone. Thus with the drill it was shown that in cases where it is desired to hold the parts of a fractured bone together in a certain position, holes can be drilled and pins inserted, which, being held in a steel frame, keep the parts exactly in position. With the circular saw it was demonstrated that pieces of any required shape can easily be cut out of and removed from a bone, or a bone can be cut through in a few seconds.

"For amputations, a small, straight saw can be used. It is simply fitted into the holder, and as it is attached to a small eccentric worked from the main gearing, it has a very rapid reciprocating action imparted to it when the gearing is put in motion, which is done by means of a small hand-wheel. The comparatively slow movement of the hand of the operator is here replaced by the inconceivably rapid motion of the mechanical saw. By this means not only is the time occupied in the operation greatly shortened, but the operation itself is much more neatly performed, owing to the smallness of the cutting instrument and the high speed at which it is moved.

"Dr. Bonwill is certainly entitled to the thanks of the medical profession, and no less those of the suffering public, for having dedicated his invention to their free service. We may add that this is not the only adaptation of mechanical means to surgical ends devised by Dr. Bonwill. He has made several other applications of machinery in minor surgery.

THE PHYSICAL CONSTITUTION OF MATTER.—We clip the following paragraph from an article on "What is a Molecule?" in *Popular Science Monthly*, for September: "Modern science declares that every substance consists of an aggregation of extremely small particles, which are called molecules. Thus, if we conceive a drop of water magnified to the size of the earth, each molecule being magnified to the same extent, it would exhibit a structure about as coarse-grained as shot; and these particles represent real masses of matter, which, however, are incapable of further subdivision without decomposition. A lump of sugar, crushed to the finest powder, retains its qualities; dissolved in water, the mass is divided into its molecules, which are still particles of sugar, though they are far too small to be seen by the highest powers of the microscope. The physical subdivision of every body is limited by the dimensions of its molecules; but the chemist can carry the process further. He 'decomposes,' or breaks up, these molecules into 'atoms;' but the parts thus obtained have no longer the qualities of the original substance. Hence the molecule may be considered as the smallest part of a substance in which its qualities inhere; and every molecule, though physically invisible, can be broken up chemically into atoms, which are themselves the molecules of other and elementary bodies."

HEAT FROM EXPLOSIVES.—When, say MM. Sarrau and Vielle, an explosive is decomposed, the heat liberated is equal to the exact excess of the heat of formation of the products over the heat of formation of the explosive. If, then, the heat liberated by decomposition be known, and the composition of the products of the reaction be known, as well, the heat of formation may be ascertained.

THE ELECTRIC LIGHT.—At the last meeting of the French Academy of Sciences, M. Jamin communicated a "discovery" relating to the electric light. He has found that when the electric arc is produced in a closed globe (not exhausted) in which the air cannot of course be renewed, the carbon burns away until all the oxygen is consumed. So soon, however, as the chemical phenomena of combustion are complete the arc increases in size and becomes fixed, so that the oscillations of the light disappear completely. Moreover, the consumption of carbon is diminished to two millimeters per hour, so that a carbon "candle" of 30 centimeters will last 150 hours. This improvement obviates the necessity of renewing the carbons every day. The discovery, however, is by no means a new one, and Mr. Sawyer and other experimentalists deny its practicability.

POWERFUL EXPLOSIVE COMPOUND.—Berthollet's fulminating silver is a very dangerous substance which results from the action of ammonia on oxide of silver. A very good receipt for producing it, is as follows: Digest freshly precipitated oxide of silver in strong liquor of ammonia for 12 or 15 hours, then pour off the liquid, and cautiously dry the black crystalline powder which remains and which is the fulminate. Also the decanted ammonia contains some fulminate, and this will be deposited on cooling after gentle warming of the liquid or on spontaneous evaporation. Only a few grains of oxide of silver should be used in a single operation. This is an excedingly powerful and dangerous explosive, the properties of which are but little known though it was discovered in the last century. It is mentioned in but few of the books on chemistry.

DEMAGNETIZING WATCHES.—Since the introduction of dynamo-electric machines a good many valuable watches have been almost completely ruined by having their works magnetized. Mr. Maxim, the electrician, has, however, invented a machine, now at the Paris Exhibition, which in a few minutes completely demagnetizes a watch, leaving it as free in its movements as ever. By mechanical arrangements the watch to be demagnetized is given a compound rotary motion near a revolving electro-magnet, and is at the same time gradually withdrawn from the latter's influence. The theory is that the watch is subjected to rapid reversals of polarity in a gradually weakened magnetic field until the final reversals are practically *nil*. At all events, the machine restores to running order a watch so thoroughly magnetized as to be incapable of making a single stroke of the escapement lever.

THE ROOT OF THE COTTON PLANT.—Mr. W. C. Staehle, an American chemist, has discovered a curious new product in the bark of the root of the cotton plant (*Gossypium herbacium*). When the bark of this root is exhausted by alcohol of the specific gravity of 0.84, a dark reddish-brown liquid is obtained, which when distilled to recover the spirit, leaves a resinous matter which amounts to 8% of the original weight of the bark. The new product thus obtained appears black and shining, but when pulverized takes the color of cochineal. It dissolves in 14 parts of alcohol, 15 parts of chloroform, and 122 parts of benzol. It dissolves also in caustic alkalies, and is precipitated from these solutions by acids. Hydrate of potash colors green. Sulphuric acid dissolves it with a red-brown color. Its other properties have not yet been examined.

A NEW SOURCE FOR CITRIC ACID.—At present, lime juice, from which citric acid is made, has to be imported into the United States, but the New York *Commercial Advertiser* says it could easily be produced from the fruits growing in Florida, if only sufficient energy were put into the work. Efforts are now being made to induce the lime and lemon growers of the south to prepare the lime-juice, and if this should prove successful, there being no reason why it should not, the entire production and manufacture of citric acid will be kept in the country, saving hundreds of thousands of dollars annually, and developing another great industry.

CONDENSATION IN STEAM WARMING PIPES.—Ordinary steam pipes used for heating purposes in a room having and maintaining a temperature of 60°, will, with an uninterrupted circulation, condense .357 lb. of water per hour for each square foot of surface of pipe, while a coil, under like circumstances, will condense .29 lb of water per hour per square foot of surface.

AMBER.—Much of the amber, as it is found, is in small pieces. In order to give additional value to them, a large number of smaller pieces are ingeniously joined together so as to form one of larger size. This is accomplished by moisteuing two surfaces of amber with potash, warming them to the proper degree and pressing them together. Still smaller pieces are joined by exposing them, covered with sand in an iron pot, to the action of heat for 40 hours, or boiling it for 20 hours in rape oil, when the material will become transparent and the pieces will fuse together. As vessels and other objects of great size made of amber have come down to us from remote times, the fact suggests the probability that the art of molding and working amber in some such manner was known and practiced by the ancients.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Sept. 1.		Week Ending Sept. 8.		Week Ending Sept. 15		Week Ending Sept. 22	
Alpha	4	3.53	3⅜	....	4⅜	3.90	4½	3.95
Alta	4.05	3.90	4.80	4.40	6	4⅝	5⅝	5
Andes	1.20	1.05	1.50	1.05	2.30	1.70	2.30	1.70
Albion	2	1.70	2.20	1½	1.95	1.70	1.95	1½
Argenta	....	....	....	....	....	....	15c	....
Addenda	25c	20c	20c	15c	20c	15c	20c	15c
Belcher	3.05	2.80	3	2.60	3.30	2⅜	3.35	3
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	13⅜	11⅛	12½	11⅛	16	13	15½	12½
Bullion	1.20	1.10	1.15	80c	1.30	1	1¼	60c
Bechtel	1.30	1	1.05	80c	1	95c	90c	75c
Bel Isle	20c	....	15c	....	15c	....	....	....
Bodie	9⅛	9⅛	9⅛	....	9	8⅛	8⅛	8
Benton	95c	90c	95c	85c	1.05	95c	1.15	1
Bulwer	2½	2.40	....	....	2⅜	2⅛	2⅛	....
Boston	....	....	20c	10c	....	....	....	....
Black Hawk	25c	20c	15c	....	20c	15c	....	....
Belvidere	....	....	....	....	....	....	25c	10c
Booker	....	....	5c	....	....	....	5c	....
Caledonia	35c	30c	30c	25c	45c	30c	40c	20c
California	1.05	1	95c	90c	1.10	90c	1	95c
Challenge	80c	....	80c	....	95c	65c	90c	80c
Chollar	2⅜	2.30	2½	2.20	3.20	2.40	3	2⅛
Confidence	3.95	3⅜	3¾	....	15	3.80	4	3¾
Con Imperial	15c	10c	15c	10c	15c	10c	20c	10c
Con Virginia	2.05	1.90	1.95	1.85	2⅛	1.90	2.20	1.90
Crown Point	2.10	1.90	2.15	1.90	1.90	1.65	1.90	1.60
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1¼	....	....	....	1¼	....	1	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	60c	40c	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2.35	2⅛	2.30	2.15	2.15	2	2.80	2.05
E. Mt. Diablo	20c	15c	20c	15c	25c	20c	35c	30c
Eureka Con	28	26⅛	28	27	27⅞	27	27⅞	27
Exchequer	1.35	1.15	1¼	1.05	1.35	1	1.30	1
Endowment	....	....	....	....	....	....	....	....
Grand Prize	30c	5c	50c	....	35c	40c	....	40c
Golden Gate	2⅜	....	2⅜	....	....	....	....	....
Goodshaw	55c	35c	....	....	50c	45c	45c	....
Gould & Curry	7⅛	6⅝	7⅛	6⅜	9	7⅜	8⅝	7
Hale & Norcross	4.20	3.80	4.05	3⅜	4.80	4	4.60	3.80
Head Center	1	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	45c	40c	40c	35c	50c	40c	50c	30c
Justice	80c	75c	75c	70c	90c	70c	1.10	30c
Jackson	....	....	....	....	....	....	....	....
Jupiter	20c	10c	....	....	....	....	....	....
Kentuck	2.10	2	2	1.60	1.80	1.60	1⅞	1⅛
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	20c	15c	20c	15c	25c	15c
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2	....	1⅞	....	1⅞	....	....	....
Martin White	25c	....	50c	....	90c	60c	1¼	....
McClinton	10c	....	....	....	10c	5c	10c	....
Mono	3.80	3⅛	4	3.55	3.65	3.30	3	2⅛
Mexican	10⅞	9⅛	10⅛	9⅜	14⅜	11⅛	14	11
Mt. Diablo	6	....	6⅛	....	6⅛	6⅛	6⅛	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1	90c	90c	80c	85c	45c	65c	50c
New York	15c	10c	....	....	20c	15c	15c	10c
Northern Belle	16	15⅛	17⅞	16⅛	17⅛	16⅛	14⅞	11⅛
North Noonday	65c	....	50c	....	....	....	....	....
Navajo	40c	....	....	....	25c	....	35c	25c
Occidental	1.90	1⅛	1⅛	....	1.55	1⅛	1⅛	....
Ophir	6⅞	6⅜	6⅞	6⅜	9⅛	7	9⅛	7⅛
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.90	1⅛	2	1⅛	2.90	2	2.95	2.55
Oro	50c	45c	50c	40c	45c	40c	65c	55c
Paris	....	....	....	....	....	....	....	....
Potosi	3.20	2⅜	3.30	3	3.80	3.30	4.10	3.15
Queen Bee	5c	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	3.30	2.90	3.30	2⅜	3.80	3.05	3.60	2.80
Seg Belcher	6⅛	6	8	6⅛	9⅛	7	9⅛	9
Sierra Nevada	17	13⅛	16⅞	14⅛	28⅛	19⅛	28⅛	18
Silver Hill	15c	10c	10c	....	15c	10c	40c	30c
Silver King	20⅛	19⅛	19	15⅞	19	17	19⅛	18⅛
Succor	....	....	....	....	....	....	....	....
Summit	25c	....	25c	....	30c	25c	25c	....
Scorpion	1.70	1⅛	1.70	1.55	2.65	1.85	2.60	1.90
Solid Silver	....	....	....	....	....	....	35c	....
South Bodie	....	....	5c	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	45c	40c	45c	....	40c	....	45c	....
Tioga Con	40c	....	40c	25c	25c	....	50c	40c
Tiptop	6	5⅞	5⅞	5⅞	5⅞	5⅞	6	5⅞
Tuscarora	....	....	....	....	....	....	20c	....
Union Con	14⅜	10	13⅜	12⅜	19⅛	15⅞	19⅛	14⅜
Utah	9⅜	9⅛	10⅛	9⅛	14⅜	11	14⅜	11⅛
Ward	....	....	....	....	....	....	2⅜	....
Wales	75c	60c	90c	80c	....	....	80c	....
Yellow Jacket	6	5⅜	5⅞	4.80	6⅛	5⅛	6	4.80

Sales at S. F. Stock Exchange.

Thursday A.M., Sept. 22.

125 Alta.....57
580 Andes.....1⅞@1.70
80 B & Belcher.....12½@12¾
315 Belcher.....3@3.05
260 Bullion.....60c
145 Benton.....1.05@1.10
690 Con Virginia.....2.20@2.15
10 California.....85c
360 Chollar.....2.30@2⅛
1270 Con Imperial.....20c
400 Crown Point.....1.70@1.80
10 Confidence.....3⅜
200 Caledonia.....25@20c
50 Challenge.....80c
160 Exchequer.....1.05
150 Gould & Curry.....7⅛
410 Hale & Nor.....3.85
800 Justice.....1@95c
300 Lady Wash.....15c
150 Mexican.....11¼@11
50 New York.....15c
775 Ophir.....8@7⅞
610 Overman.....2.60
285 Potosi.....3.20@3.15
945 Sierra Nevada.....18¾@19
260 Savage.....2.80
200 Sutro.....15c
585 Scorpion.....1.95
260 Silver Hill.....35@30c
100 Solid Silver.....35c
10 Utah.....11⅜
225 Union.....33½@33⅝
210 Yellow Jacket.....4.90

AFTERNOON SESSION.

100 Albion.....1¼
615 Bechtel.....75c
230 Bulwer.....2⅛
500 Belcher.....3c
225 Day.....2@2.60
150 E Mt Diablo.....45c
10 Eureka Con.....27
20 Mono.....2⅛
300 Mt Diablo.....6
125 M White.....2
300 N Belle Is.....30c
575 Northern Belle.....12⅜
50 Noonday.....56c
450 Oro.....60@65c
380 Star.....20c
125 Silver King.....19⅛
200 Syndicate.....40c

New Incorporations.

The following companies have been incorporated and papers filed in the offics of ths Superior Court, Dspartment No. 10, San Francisco:

HASTINGS CON. M. Co.—Sept. 17th. Location, Arizona. Capital stock, $50,000,000. Directors, C. C. Hastings, D. T. Elmore, Chas. H. Mann, L. H. Newton, and Chas. J. Swift.

MONO LAKE HYDRAULIC M. Co.- Sept. 17th. Location, California. Capital stock, $1,000,000. Directors, John W. Wilson, Daniel E. Jones, John Elbert, George Duncan and John E. Curtis.

DETROIT COPPER M. Co.—Sept. 17th. Capital stock, $1,000,000. Directors, John Elbert, D. E. Jones, John E. Wilson, John E. Ourtis and Jeremiah Dwyer.

NEVADA COUNTY CON. M. Co.—Sept. 21st. Location, Union Hill district. Capital stock, $10,000. Directors, E. B. Clement, Ferdinand Vassault, Thaddeus S. Fitch, Joseph W. McClung, J. C. Angell.

SILVER FLAKE M. Co.—Sept. 21st. Location, Arizona. Capital stock, $1,000,000. Directors, Philip Gerold, J. M. Prather, Julius Fay, James P. Rountree, Jr., Abraham Halsey.

COMPROMISE G. M. Co.—Sept. 21st. Location, Mariposa Co., Cal. Capital stock, $5,000,000. Directors, C. H. Light, A. D. Allen, James H. Gates, David B. Hunt, Daniel Buck.

THE boundary of Coos and Douglas counties, Oregon, where the coast range is crossed by the Coos Bay wagon road, is involved in uncertainty, and a serious question has arisen between the two counties with regard to the collection of taxes.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes M Co	Nevada	17	50	Aug 8	Sept 14	Oct 3	B Burns	309 Montgomery st
Argenta M Co	Nevada	9	10	Sept 5	Oct 7	Oct 23	F M Hall	327 Pine st
Alta S M Co	Nevada	21	50	Aug 2	Sept 6	Sept 26	W H Watson	302 Montgomery st
Albion Con Co	Nevada	8	40	Aug 1	Sept 5	Sept 26	D B Chisholm	327 Pine st
Belle Isle M Co	Nevada	3	10	Sept 13	Oct 18	Nov 6	E M Hall	327 Pine st
Belmont M Co	Nevada	29	15	July 27	Aug 30	Sept 26	J W Pew	310 Pine st
Boston Con	California	2	20	Sept 15	Oct 21	Nov 12	F D Luty	330 Pine st
Bullion M Co	Nevada	21	1 00	Sept 21	Oct 26	Nov 15	J M Brazell	328 Montgomery st
Champion G & S M Co	California	9	25	Sept 19	Oct 25	Nov 15	B Burns	309 Montgomery st
Chollar M Co	Nevada	6	50	Aug 29	Sept 30	Oct 21	W E Dean	309 Montgomery st
Con Amador	California	2	1 00	Aug 3	Sept 6	Sept 24	F B Latham	328 Montgomery st
Con Imperial	Nevada	16	10	Aug 22	Sept 27	Oct 18	W E Deau	309 Montgomery st
Con Virginia M Co	Nevada	16	30	Aug 2	Sept 24	Oct 22	A W Havens	309 Montgomery st
Crown Point G & S M Co	Nevada	45	75	Sept 7	Oct 12	Nov 2	Jas S Newlands	327 Pine st
Grand Prize M Co	Nevada	6	25	July 30	Sept 3	Sept 29	E M Hall	327 Pine st
Independence M Co	Nevada	8	15	Aug 25	Sept 26	Oct 17	E M Hall	327 Pine st
Juniata Con M Co	Nevada	5	04	Aug 18	Sept 19	Oct 8	C V Hubbard	310 Pine st
Julia Con M Co	Nevada	16	30	Sept 16	Oct 21	Nov 11	H A Charles	419 California st
Justice M Co	Nevada	35	25	Sept 13	Oct 16	Nov 6	R E Kelly	419 California st
Kentuck M Co	Nevada	16	50	Aug 22	Sept 26	Oct 17	A C Stuart	234 Montgomery st
Maybelle Con M Co	California	9	20	Sept 20	Oct 28	Nov 18	W T Taylor	310 Pine st
Meadow Valley M Co	Nevada	16	30	Aug 13	Sept 10	Oct 4	H Delaguna	414 California st
Mono M Co	California	13	50	Aug 6	Sept 12	Oct 3	W H Lent	309 Montgomery st
Mt Potosi M Co	Nevada	7	15	Aug 12	Sept 17	Oct 10	J H Sayre	330 Pine st
Murchie G & S M Co	Nevada	7	15	Sept 7	Oct 11	Nov 10	Wm Letts Oliver	328 Montgomery st
Occidental Con Gravel M Co	California	8	06	Aug 22	Oct 3	Oct 26	W T Smith	414 California st
Potosi M Co	Nevada	6	50	Aug 29	Oct 4	Oct 25	W E Dean	309 Montgomery st
Seg Belcher M Co	Nevada	19	1 00	Aug 3	Sept 6	Sept 27	G D Edwards	414 California st
Tioga Con M Co	California	14	20	Aug 16	Sept 22	Oct 12	W H Lent	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M Co	California	3	15	Aug 22	Sept 22	Oct 10	J M Buffington	309 California st
Alpha Hydraulic M Co	California	3	25	Aug 20	Sept 27	Oct 18	J Ireland	216 Sansome st
Bengal M Co	Arizona	1	02	Aug 31	Oct 7	Oct 29	J H Sayre	330 Pine st
Defiance G M Co	California	6	05	Aug 26	Sept 30	Oct 20	W H Lent	309 Montgomery st
Delano M Co	California	2	03	Aug 13	Sept 16	Oct 7	J Morizo	328 Montgomery st
East Noonday M Co	California	2	05	Aug 2	Sept 8	Sept 24	C V Hubbard	310 Pine st
Harrington M Co	California	2	05	June 15	Sept 14	Oct 4	O C Muller	409 California st
Iowa M Co	Nevada	14	05	July 27	Sept 12	Oct 5	C S Leavitt	411½ California st
May Flower G M Co	California	12	10	July 19	Sept 7	Sept 28	J Morizo	328 Montgomery st
New Basel Con Gravel M Co	California	—	10	Aug 25	Oct 1	Oct 20	F X Simon	525 Commercial st
North Gould & Curry G & S M Co	Nevada	1	25	July 5	Sept 15	Oct 12	M C Sowhard	331 Montgomery st
North Sierra Nev Co	Nevada	3	10	Sept 19	Oct 27	Nov 17	C C Harvey	309 California st
Navajo M Co	Nevada	8	25	Aug 19	Sept 22	Oct 13	J W Pew	310 Montgomery st
Oro M Co	California	9	25	Aug 16	Sept 21	Oct 12	W Stuart	320 Sansome st
Peahody G M Co	California	1	04½	Aug 31	Oct 3	Oct 21	R D Hopkins	317 Montgomery st
Santa Anita M Co	California	1	13	Aug 20	Sept 25	Oct 10	J B Titus	24 Kearny st
South Eureka M Co	California	2	10	Sept 1	Oct 5	Oct 29	T A Berlin	515 California st
Spaulding G & S M Co	California	2	10	June 28	Sept 23	Oct 21	J W Pew	310 Pine st
University G M Co	California	9	10	Aug 15	Sept 20	Oct 12	Wm. L Oliver	328 Montgomery st
Western Home Con M Co	Idaho	2	05	Aug 16	Sept 26	Oct 26	A Halsey	328 Montgomery tt

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Aurora Tunnel	Nevada	C V Huhbard	310 Pine st	Annual	Oct 5
Alexander M Co	Nevada	A B Cooper	328 Montgomery st	Annual	Sept 30
Booker Con M Co	California	W H Lent	309 Montgomery st	Annual	Sept 26
Belle Isle M Co	Nevada	E M Hall	327 Pine st	Annual	Oct 2
Golden Gate Con	California	J T McGeoghean	318 Pine st	Annual	Oct 3
Hillside M & M Co	Nevada	F Frankenthal	330 Pine st	Annual	Oct 1
May Flower M Co	California	J Morizio	328 Montgomery st	Annual	Oct 3
Mint M Co	California	H H Haskell	528 California st	Annual	Sept 26
Mt Potosi	Nevada	J H Sayre	330 Pine st	Annual	Sept 28
Tellurium G & S M Co	———	J M Litchfield	419 Montgomery st	Annual	Sept 29

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Sept 27
Father De Smet M Co	Dakota	H Dean	New York	50	Sept 10
Northern Belle M & M Co	———	Cal Wm Willis	309 Montgomery st	50	Sept 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Sept 15
Silver King M Co	Arizona	J Nash	315 California st	25	Sept 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Sept 12
Tip Top M Co	Arizona	H Deas	309 Montgomery st	20	Aug 25
Western M Co	California	C S Curtiss	309 Montgomery st	75	Sept 10

The Mining Share Market.

There has been more movement in the stock market than usnal, notwithstanding the general gloom in business circles, caused hy the death of the President. Still, the market has not heen as active as last week. Our stock tahles show the fnctnations. Nothing is known yet of Sierra Nevada, whether there really is ore there or not. The *Enterprise* says: Althongh the exact condition of the hottom of the joint Sierra Nevada and Union Con. winzs is not at present made known, we have Senator Fair's word to the effect that sufficient ore made its appearance at that point to cause him to believe that what had heen found was a substantial hody of ore, and no mere feeder or stringer. Although reticent in regard to what has been done since that time—for reasons hest known to himself and the Directors of the company—we know that work for the development of the deposit is heing pushed as rapidly as possihle, and also know that some specimens of good ore have heen brought to the snrface.

As there is a strong flow of water, and as this must he raised hy donkey pumps a distance of about 250 ft., it is evident that the work of sinking cannot be very rapid, yet the management appear to he well satisfied with what is heing shown np.

While the ventilation is good to the northward of the Ophir incline, to the southward of that point it is not yet all that could he desired, hut will donhtless he improved when the suction fan goes into operation at the top of the Consolidated Virginia shaft.

The diamond drill has been put into the joint Consolidated Virginia and Best & Belcher east crosscut on the 2300 level. Drillings assaying as high as $8 per ton are heing ohtained. This is very encouraging for hoth the companies named.

The following diepatch from Eureka gives news of a rich strike there: There is considerable excitement here over a strike in the Eureka tunnel, an enterprise inaugurated fonr years ago hy Gen. P. E. Connor. The tnnnel penetrates Prospect mountain over a mile south of the Ruhy Hill mine. It has heen generally helieved that the Ruhy Hill ore channel extended through Prospect monntain, and this strike demonstrates that it does. The development was made about 800 ft. below the surface. The ore assays from $600 to $1,000 to the ton. The hody is strong and improving honrly. It is chiefly important as establishing the continnity of the Ruhy Hill ore channel along to the sonthward. The tnnnel is in the natnre of a private enterprise, and the stock is not listed on any Board.

Ventilating Bonanza Mines.

In our "Mining Summary" will he seen references to the improved ventilation expected at several of the Comstock mines, when the hig suction wheel gets into operation, the heat heing excessive at many points. The *Enterprise* of recent date, in speaking of the preparations for setting the wheel says: Preparations are heing made for setting np at the top of the old Con. Virginia shaft a wheel 30 ft. in diameter, which, hy heing rapidly revolved, will draw the air up the shaft, and thus increase the ventilation in the lower levels of the California and Con. Virginia mines. As the boilers are still standing in their house near the top of the shaft, all ready for use, it will cost hut little to set the snction wheel in motion. The wheel will be erected under the large platform now seen surrounding the curhing of the top of the shaft, which platform was formerly the first floor of the hoisting works.

There is now a very good circulation of air northward from the Ophir iucline, hut to the sonthward, through the California and Coo. Virginia gronnd, the draft is quite eluggish and the heat so great that oporations are well nigh suspended at most points.

We understand that a blower or hlowers will also he set up at the hottom of the shaft, pipes from which will he run up to a proper hight, and air hlown up the shaft. Thus a strong current of air will for a time he forced np through the shaft. Once such a current has been fully estahlished, it is expected that the wheel and hlowers can he stopped and taken out. The wheel, however, will he kept in readiness to he used at any future time should the circulation of air again become sluggish through connections made at points to the eastward in the lower levels.

Bullion Shipments.

We quote shipments since our last, and shall he pleased to receive fnrther reports:

Germania, 13th, $3,500; Hanauer, 13th, $2,160; Stormont, 13th, $3,485; Horn Silver, 13th, $5,000; Frisco, 13th, $10,020; Tintic, 13th, $21,010; Germania, 14th, $7,000; Horn Silver, 14th, $7,500; Frisco, 14th, $2.230; Mammoth, 14th, $2,700; Horn Silver, 15th, $5,000; Barhee & Walker, 16th, $1,528; Nevada, 17th, $1,350; Stormont, 17th, $3,475; Germania, 17th, $4,900.

BEING unahle to ohtain the right of way over placer claims south of Butte, Montana, the Utah & Northern will not hnild the road to that place.

MINING SUMMARY.

The following is mostly condensed from journals publisbed in tbe interior, in proximity to tbe mines mentioned.

CALIFORNIA.

AMADOR.

SLABTOWN GRAVEL CLAIM.—Amador *Ledger*, Sept. 17: This claim at Slabtown bas recently been fitted up with hydraulic power by Messrs. Hatfield, Miner, & Co., of San Francisco. Tbey obtain the water supply from the big canal, and have put tbe old Butte ditch in order to convey water from the canal to tbe claims. One giant bas been operating about two weeks, with from 150 to 200 inches of water. The gravel looks well, and it is thought by good judges that tbe claim will prove remunerative.

JACKMAN.—A sample crusbing of rock from this mine, comprising from 20 to 30 tons, has just been finished at tbe Monterichard mill. We have not heard how it turned out.

MISCELLANEOUS.—All the water has been taken from the Volunteer shaft. The calculation is to sink to a considerable depth before drifting. C. Peters has completed taking the water out of the sbaft of the Brown Co's. claim, near Jackson. He has retimbered the sbaft tboroughly, and done other necessary work.

CALAVERAS.

THE GWIN MINE.—Calaveras *Chronicle*, Sept. 17: Leaving Mokelumne Hill in the morning, after a ride of about 6 miles we reached the famous Gwin mine, one of the finest pieces of mining property in the State, and one wbich for many years past has been yielding up its wealth of precious metal. There are splendid hoisting works on the mine, 2 quartz mills, the upper mill having 32 stamps, and the lower one 24, sulphuret works, and in fact everything that is necessary for working ore. Through the kindness of Mr. Wm. M. Gwin, Jr., who is at present personally superintending the mine, we received the following information: The pumps are in excellent order and running and no trouble is experienced from the water. The work of retimbering the old shaft is now completed down to the 600 level, the tunnel repaired and everything is about ready to commence hoisting ore. There is a large reserve of good quality ore in the level which will supply 100 tons of rock a day for a year. Work is still being done in the 400 level, showing very rich rock in the upper stopes of the level. Some difficulty is experienced to get it owing to the heavy caves in the lower stopes. Work is being done in the 400 level in the north sbaft. A large body of ore was tapped in the Smith ground recently purchased by the company. A tunnel on the surface on the Smith ground was run about 50 ft on the ledge, which is from 6 to 8 ft in width and fair grade ore. The prospects of the mine are very favorable, and it will soon be on a handsome paying basis.

CAMPO SECO was once one of the liveliest mining camps in the State, but at present presenting little of its former business activity. There is a little placer mining carried on in the vicinity during the season when water in obtainable, but at this season of the year mining operations must necessarily be suspended for want of water. Quartz abounds in the vicinity, and we understand it is the intention of prospecting some of the ledges.

MILLS.—*Mountain Echo*, Sept. 13: The noisy stamps of both our mills are in motion, and the hauling of quartz through our streets is an enlivening feature. Moss & Stooe's mill is working ore from the Buck Horn, a mine whose reputation has been established some time ago. Next week the mill will run on Eddie Dewalt, quartz. This mine has been opened over two years, but no rock has ever been worked from it. It is situated near Murphy's, in one of the richest localities in this vicinity. The quartz is considered high-grade and good results may be expected. Work on the Oro Plata still continues, with excellent results. The company is so well satisfied with their prospects that they have recently purchased an adjoining mine from Page Cutting. This mine was formerly worked by the Blue Wing Co., 20 years ago. Ore of exceediug richness has been taken from it. Work on the Union Water Co's. reservoir is drawing towards completion. In the end of the present month this fine structure, it is expected, will have been finished. The dam is highly spoken of and reflects credit upon the arti-ans engaged on it. Its capacity has been largely increased, and in seasons like the present will be of incalculable advantage to mines in this vicinity.

THE Hite mine and mill are idle at present. Extensive improvements are being made. A 140 horse-power compressor with a 64-inch cylinder is being put in. The power is obtained from the sand-mill, about 4,000 ft below on the river. The dam is also being repaired. A new shaft is being sunk from the lower level, which produces better ore than has been taken from the mine for some time. With the additional facilities herein named and the excellent prospect of a fine body of ore before them, the Hite G. M. Co. is assured of success in the near future.

MODESTO SILVER M. Co.—The works of this mine have been of late somewhat retarded, but not wholly so, on account of some irregularity occurring in the business of the Co., which we understand is fixed up satisfactory, and the work of sinking the shaft and taking out ore is being continued. The shaft is at present about 210 ft. deep, with a vein of 16 inches, and has the appearance of increasing in width as the shaft goes down. The ore taken from the bottom of the shaft, which has been carefully examined by outside parties, is estimated at $400 a ton. The Co. has already upon the dump fully 100 tons of ore, which is estimated worth from $200 to $400 a ton. The present Supt., Mr. Scribner, stated to one of our business men of the town that with a proper mill he could soon pay all cost heretofore incurred, besides keeping up expenses of running the mill and extracting ore from the mine. The Co. has in contemplation the erection of a mill as soon as practicable.

ELDORADO.

MINING IMPROVEMENTS.—*Mountain Democrat*, Sept. 17: Dan Wickham has taken a contract to build a 10-stamp mill and hoisting works on Texas hill, this city, for which the Blair brothers have contracted to furnish 20,000 ft of lumber, a large portion of which is already delivered. Supt. Aldersly, of the Chapparal and Gopher-Bowlder mines, is preparing to put up 10 additional stamps in the new mill at the Bowlder mine. Sam. Sample, of San Francisco, and his associates, are preparing to put up substantial works on the "Old Judge" mine, which has a very promising 4½ foot ledge of high average ore.

DRIFTING.—Georgetown *Gazette*: The mining claim owned by Dams & Jacott on Slate creek, about a mile from town, is being worked by Jacott & Adney. They have kin side their hydraulic and started a drift which is now in about 40 ft on the channel, with every indication of a hill channel. It is well defined, and they think if they strike hard bed rock heavy wash gold will be met with. The bed rock is now soft and pays about $2 per day.

INYO.

PANAMINT.—Inyo *Independent*, Sept. 17: A short time ago some conscienceless liar from Panamint reported to some New York party here that the big mill at Panamint, now the property of the Inyo Con. M. & M. Co. of New York, has been running on waste rock. Now, the situation of Panamint, having at present no mail facilities or regular communication with the county seat, renders it difficult to obtain mining reports from there—we have only been enabled to mention the frequent bullion shipments to Darwin, and approximate its value by the weight. We have obtained, however, some data going to show where the "waste" came from, out of which the dividend —or dividends—were declared. During the two runs the mill worked ore from the Hemlock and Wyomiog mines aggregating $12 000; 10 tons from the Mariposa, worth $146.50 per ton; from the Erie, 3 tons; Magnet, 12; Ophir, 9, besides lots from mines belonging to Bastian, Smith, Carberry and others. The ores last mentioned averaged $150 per ton. Most mine and mill owners would be thankful for a considerable quantity of such "waste."

The whole yield, up to our latest information, was 25 bars of bullion, 900 fine, weighing 80 lbs each. There is rich ore in all the mines and on all the dumps, and the old camp has taken a very decided jump ahead.

MODOCK.—Frank Fitzgerald, lessee of the Modock mines and furnaces at Lookout, has taken out 70 tons of ore so far, and continues extracting it at the rate of 5 carloads daily, or about 4 tons. Deering & Welch have about 45 tons of lead ore, average car samples 111 ounces silver per ton; 47% lead. Barrow & Co. commenced work on the 24 instant on a seam of ore 2 inches wide. It has since opened out to a ledge 2 ft 9 inches wide, and getting larger every shift. Average car samples of this ore is 205 ounces of silver per ton. It is the most important strike that has been made in the mine for the last 2 years. Will commence to get in coal in 2 weeks and will start furnace about the 20th of October, on Modock and Minnietta ore. Will have about 90 tons of the latter.

MARIPOSA.

WASHINGTON.—Mariposa *Gazette*, Sept. 17: The Washington mine is putting in new and costly improvements, which is evidence of a good mine and permanency. The new improvements consist of a 55-inch tubular boiler, a new skip, a large compressor, and are using the Ingersoll drill, which gives good satisfaction. They are now sinking 200 ft below the 1400-ft level, which gives 200 ft stope to an 8-ft vein, which appears at the 1400-ft. The mill will be in readiness for a fresh start in 8 or 10 days, with a prospect more favorable than ever before

THE NUMBER NINE, more recently called the Yosemite mill and mine, is now running 55 stamps, and crush 40 tons per day. Since the completion of the pipe they have plenty of water for all purposes. Under the new management, with Frank Thorn as Supt.; Alex Mason, a first-class engineer, and Henry Gerkrts, a No. 1 amalgamator, the mine is fast proving itself a success. The first clean-up of the mill under the new administration the rock averaged between $6 and $7 per ton, and the second, which occurred recently, the rock paid $9 a ton. Mr. Thorn, Supt., is running the mill with five less men than formerly under Mr. Boise, and is making it by amalgamating in the batteries, using fine screens and limiting each stamp to a ton and a half of ore every 24 hours, instead of 3 tons as formerly. The No. 9 promises to be a success, notwithstanding the cloud thrown upon it by a former administration.

MONO.

MAY LUNDY.—Homer *Index*, Sept. 17: The additional 5 stamps placed in the mill have been running all the week, and working admirably. The self-feeder has not yet been attached to the new battery, but will in a short time. The mill building has been greatly enlarged, in order to house numerous improvements now under way. Two large pans and a settler are to be put in, one of the pans being now in the building. Three lines of blanket sluices are to be extended to the end of the new east wing of the building, from which point they will return to the southeastern corner of the old building and pour the tailings into a V flume, fed by water from the tail race, which will conduct them into a lower amalgamator placed at the eastern base of the present tailings dump. The foundation for the new amalgamator has been completed, and the machinery is now on the road. It requires nothing but water to operate it.

NEVADA.

A TERRIBLE SLIDE.—North San Juan *Times*, Sept. 17: A terrific slide occurred at the Blue Point mine at Moore's Flat last week, which completely covered up the works of the company, and caused the stoppage of all work at the mine. From 50 to 75 men were thrown out of employment by the operation. The whole top ground, acres in extent, slid in. Happily, the workmen saw the slide coming, and prepared for it. They moved the tools, the monitors and the loose mining apparatus, including hose, pipes, etc. It will require from a month to 6 weeks steady washing with a thousand inches of water to place the mine in the condition it was before the slide occurred. Mr. Brigham, the manager of the mine, will set men to work in a day or so to construct a drift tunnel into the mine for the purpose of working it by the drifting process, until hydraulicing can be resumed.

MILL.—*Transcript*, Sept. 10: The Mt. Auburn Mining Co. has positively concluded to put up a mill on its property, to crush the immense quantity of ore that has been opened up. The plans for the construction of it are about ready. Mining locations are on the increase, and it shows that prospectors are still at work. We believe that in the course of a year or so our quartz mines will be doubled in numbers and many grand developments will be made.

NEW YORK AND BROOKLYN MINE.—*Transcript*, Sept. 18: We are assured that the prospecting operations being carried on at the "Wilson Ranch" in Willow valley, this district, by the New York and Brooklyn Q. M. Co. are leading to very satisfactory results. The ledges have been tapped in 5 or 6 different places by tunnels, shafts and pits, and considerable promising looking ore is ready for milling. Some of the N. Y. gentlemen interested in the claim are now on their way here, and will arrive in a few days. They, will, according to present intentions, make arrangements as soon as they come for systematically developing the ground on an extensive scale, among other things having the erection of the hoisting works begun.

PLACER.

RICH ROCK.—Placer *Herald*, Sept. 17: T. J. Hunter had some very rich rock with him in town last Saturday which he had just taken from his mine in Duncan Hill. This same ledge turned out some exceptionally rich rock about a year ago, and from the appearance of the specimens lately taken out, its richness is by no means exhausted.

RICH COPPER ORE.—J. M. Bryan, who is prospecting for gold near the Good Friday, has come upon an uncommonly rich lead of copper ore. We were shown some specimens last Monday by Samuel Kaiser, which were almost pure copper. Kaiser informs us that the copper deposit is very extensive. What a strike this would have been 10 or 17 years ago, during the copper excitement. There will yet come a day when these rich copper mines will pay.

PLUMAS.

RICH IRON ORE.—Greenville *Bulletin*, Sept. 14: Mr. Meylert brought over some specimens of iron ore from the great mine near Quincy, which look almost like cast iron. Mr. Henry Kellogg, now living at Spanish Ranch forged a horse shoe direct from this ore some years ago.

SAN DIEGO.

THE ORIFLAMME MINE.—Cor. San Diego *Union*, Sept. 12: The first crushing commenced a few days ago at the Oriflamme mine under its new management. The 10-stamp mill is in excellent running order, and is now crushing some pretty fair ore. The mine is looking well, and a force is engaged in running tunnels and sinking a shaft on the 125 level. At this depth the vein is 4 ft wide, and as the excavations progress the showing of gold becomes more encouraging. At the 100 level the miners are doing some extensive stoping. Here the quartz is of a good character and runs very even. The ore is shipped from the mine to the mill in small cars, down a steep tramway, about 450 ft, and is dumped into the mill back of the stamps, where it is received by a man who breaks it into small pieces. This ore is then fed into the battery where it is reduced by the stamps so as to pass through a fine sieve. In a pulpy state it passes over the copper plates that are thoroughly coated with quicksilver, which attracts the gold. This mixture is then washed in concentrators, which separates the sulphurets from the pulp.

SISKIYOU.

AUTUMN WORK IN THE RIVER MINES.—Yreka *Journal*, Sept. 17: The Centennial Co., just below Virginia Bar, on the Klamath river, have found very good prospects at present working, and will undoubtedly strike big pay when they near the bedrock. The Yreka Creek M. Co. are unable to obtain sufficient water for running the elevator and giants more than one-third of the time, and are now busy when waiting between times for water, in removing the huge boulders found in the bed of the creek. A correspondent writes us that Virginia Bar is a lively mining camp, and in another year will show still greater improvement and prosperity, as all the mines in the vicinity are looking well, some extraordinarily so. The Kanaka claim looks as good as ever, and the men are taking out great quantities of gold all the time. The Centennial Co. are also doing well at present. They took out one boulder the other day, from which $10 was realized, the gold sticking to the rock and cement. The boys were rather excited over the prospect at the time, some exhibiting smiling faces, and one in particular feeling so good, that he tried to stand on his head on the boulder containing the gold. The Fort Jones Co. are now putting on night shifts, which indicates good prospects, as they have undoubtedly a good paying claim. The Mott claim is paying well, and the Portuguese Co. and China Co., as well as all the other companies seem to be doing well. Messrs. Fletcher & Wright, of Oro Fino, are busy preparing for the winter, in sawing out blocks for sluices and otherwise fixing up to commence piping with their hydraulic when water comes. Other hydraulic miners in the same locality, are also making similar preparations, all anticipating a profitable season during the winter and following spring. The Chinese Co., at the mouth of Scott river are hoisting out gravel, and are believed to be realizing good prospects. Martin, Andrews & Co., working just below the mouth of Scott river, in the old channels of both Scott and Klamath rivers, are about ready to pump out, and will soon commence making a cut inside of their wing-dam, some 80 or 90 ft long by 50 ft wide, with the intention of going down 30 ft before trying to get any pay. Their wing-dam is 400 ft long, and they have two line derricks, which being operated day and night, will get away with the channel gravel quite lively. If the heavy rains hold off until December or the end of November, this Co. will no doubt take out a big pile of gold.

SIERRA.

RUNNING.—*Mountain Messenger*, Sept. 17: The Gold Bluff mill is running day and night, and the rock is paying well.

PIPE.—Heavy 20-inch pipe for the Good Hope mine arrived last Wednesday.

WORK ON the Extension's arrangements for pumping water are about completed.

NEVADA.

WASHOE DISTRICT.

CALIFORNIA.—*Enterprise*, Sept. 20: No sinking has been done in the winzes below the 2500 level, as the mine has been too hot to allow of work being advantageously done. A large fan is being erected at the old Con. Virginia shaft (by the several companies that will benefited thereby), which will render the mines cool and pleasant.

CON. VIRGINIA.—No work has been done in the mine the past week, except in the retimbering of the various drifts which were closed during the time the old stopes were on fire. We have drifted east 85 ft from the east end of the joint crosscut of the Best & Belcher on the 2300 level. The rock passed through by the drill is hard, with seams of quartz. The best assay obtained was $8.

OPHIR.—On the 2700 level the south drift has been run the past week 21 ft. The material passed through has been quartz, clay and porphyry. The ground is dry. On the 29 level the east drift from the joint Mexican winze has been extended 18 ft, passing through quartz, clay and porphyry, giving low assays. Are reopening the old Simonton tunnel, which runs under the little ore vein opened by Rowe on the croppings of this mine in 1859-60.

UNION CON.—On the 2700 level the west drift from the joint Sierra Nevada winze has been discontinued for fear of water. The joint Sierra Nevada east drift from the shaft has been extended 26 ft, and winze sunk and timbered 10 ft.

MEXICAN.—On the 2900 level the east drift from the joint Ophir winze has been extended 18 ft, and has passed into a mixture of quartz, clay and porphyry, giving low assays

SIERRA NEVADA —On the 2500 level east crosscut No. 1 has been extended 17 ft; No. 2 advanced 31 ft, and No. 4 30 ft. The main north lateral drift has been extended 22 ft. On the 2700 level the joint Union Con. east drift from the shaft has been extended 20 ft, and winze sunk and timbered 16 ft.

YELLOW JACKET.—The north lateral drift on the 3000 level has been run 35 ft during the past week, making the present length 212 ft. The ground continues hard and dry. The quantity of water pumped continues the same. The Belcher & Crown Point pumps are not running.

NEW WELLS-FARGO.—The south lateral drift on the 500 level has been thoroughly timbered, and the drift extended 10 ft, following the east clay of the vein. The formation still continues to look well.

ALTA.—The 2150 pumps were started up last night, and all the machinery is working well, although the contemplated change in the pumping engine has not yet been made.

BRISTOL DISTRICT.

RESUMED.—Pioche *Record*, Sept. 10: The late mining boom has enthused new life into many, prospectors particularly so, as work is to be resumed upon several promising mining claims next week, and several have been stimulated to a renewed search for the rich "float" ledge near the Bristol tunnel and Loro Vale ground.

THE Mayflower is a veritable honanza and shows a larger body of ore in sight than any other mine in southeastern Nevada, one winze having been put through $100 rock for 50 ft, with no walls. Where has it an equal in this section of the State?

THE furnace of the Day S. M. Co. has been thoroughly overhauled and every thing is now in readiness for starting up next week. More teams have been put on, and from 20 to 30 tons of ore are coming down daily.

THE Bristol Co.'s mill will probably start up the latter part of next week. The base bullion piled up at the Day furnace looks very pretty.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, Sept. 17: The development in the 11th level is furnished with a good grade of ore. The 10th level is looking very well, showing a good body of ore. There is no material change in levels above, except between the 5th and 6th, where the ore has widened and looks quite promising. The development above the 4th shows no change of consequence. There are being extracted and sent to the mills about 85 tons of ore daily. Both mills are running steadily and doing good work. Bullion shipments for week ending September 14th, $27,-984.78. Shipments on September account to September 14th, $42,487.21.

MOUNT DIABLO.—The face of the west drift on the 2d level shows a small streak of ore, and has advanced 13 ft. A stope has been started about 25 ft above the west drift on the 2d level, and shows a ledge of ore from 2 to 2½ ft in width. The ore assays from $80 to $90 per ton. On the 1st level a winze has been started in the east drift, about 30 ft east, and shows a good streak of ore assaying $100. The drift in the foot wall, on this level, and west of the shaft, looks very well.

CHERRY CREEK DISTRICT.

NO MEN WANTED.—Cor. Eureka *Sentinel*: In a late issue it is stated there are no idle men here who are willing to work. I do not know who your informant was, but this much I do know, that he is an infernal liar; for I am sure I am willing to work. Yet I have been idle for the past three months in spite of my best endeavors to prevent it. I even offered to go and cut wood for $1 25 a cord among the Italians; yet, so help me God, I was refused that. I daily see idle men all around me complain of the lack of employment. I am sure the large majority of them are willing to work if they can get it. In conclusion, let me assure you that I know of no place where miners, millmen, or workingmen of any kind are more likely to be in a state of enforced idleness than in Cherry Creek at the present time.

GARFIELD DISTRICT.

SINKING FOR WATER.—Candelaria *True Fissure*, Sept. 17: Realizing the necessity of its uses, both present and future, and the labor attending the packing of water into their camp at Garfield district, Messrs. Johl and McDonald have commenced digging a well. They are already down 143 ft, at which point work has been temporarily suspended. The swaying of the bucket against the sides of the shaft tends to loosen the dirt, which falls upon those at work below, inconveniencing their operations. Wooden guides will be put in at once, and it is thought water will be struck at a depth of 300 ft; if not, the work will be pushed to a level of 500 ft.

SAFFORD DISTRICT.

EXCITEMENT INCREASING.—*Silver State*, Sept. 17: The railroad boys say the excitement over the mines of Safford district is increasing rather than diminishing. A dozen or more persons go there daily, but visitors as well as mine owners, have to go to Palisade every night, as there are no accommodations at the mines. D. H. Haskell, town site agent, returned yesterday from the mines. He says a side track is to be built immediately, so that trains can pass each other there, and freight can be unloaded. Dow Huntsman has selected a site for a hotel, and he will have accommodations for the public in a few days, so that the men will not be obliged to go to Palisade every night. The mines improve in appearance daily as they are being opened. A remarkably fine body of free milling ore has been exposed on the Contention claim, which experts say is proving to be the best mine yet discovered, not excepting the Onondaga. L. L. Rickard intends to put on a stage line next week between the side track at the new town of Mohawk and the mines.

STAR DISTRICT.

AN IMPORTANT STRIKE.—*Silver State*, Sept. 16: District Attorney McMillan, who has been on a visit to Unionville, says he was informed by Peter Woolcock, Superintendent of the De Soto mine in Star, that they have the finest body of ore in sight ever seen in the mine. The De Soto was located as an extension of the Shoba, in early days, and both yielded considerable rich ore and the stock sold at a high price. For years past Peter Woolcock has been at work with a small force of men on the De Soto. Occasionally he would find a bunch of good ore, which he extracted and shipped to San Francisco, to pay expenses. Now, he has a large ledge of rich ore, which has every indication of being permanent. This will probably stimulate the Shoba Co, and others owning mines on the Shoba belt to resume operations.

ARIZONA.

SILVER DISTRICT.—*Arizona Sentinel*, Sept. 17; Mr. S. S. Draper, general manager of the Red Cloud O. and S. M. Co., having resigned, Mr. Knapp, of New York, has been appointed in his stead, and the entire management changed on the Silent mine. We trust this is but the initiative step toward a thorough development, and the practical, earnest mining proper on this truly remarkable and exceedingly valuable property. The pick strike was made in cut No. 2. There is 6 ft of a friable quartz that pulverizes from a blow of the pick, and is of all the variegated hues of the rainbow, the yellow oxides of lead and a deep green color predominating. The ore seam, which runs with the trend of the ledge, is from 4 inches to 2 ft in width, of gray carbonate and black sulphuret ore, and several lateral seams of the same character coming in, in descent, with occasional kidneys or nuggets, of pure black sulphurets encountered in the intervening spaces, so soft that it may be whittled like soap.

OUR southern Arizona mining camps excel this county in the pleasant surroundings of "babbling brook and verdant vale;" but over all hangs the baleful curse of their Indian troubles, and already does it reckound to the benefit of Silver district. Inquiries are coming from capitalists as to the general standing of this district, and the opportunities for investment, etc. To all such we would say: No danger from Indians need be apprehended in this flourishing district, and the opportunities for acquiring valuable mines where the facilities for working, contiguous to the Colorado river and steamer landings, rail and telegraphic communication, but 45 miles distant, prove it is excelled by no other mining camp in the Territory.

WORK RESUMED.—Globe *Chronicle*, Sept. 15: We are glad to state that work has been resumed on all the principal properties in the district, and it is to be hoped that there will be no further suspension of work on account of the Indians. The machinery for the Globe City mill having arrived last week, was soon put in place, and the stamps have been making a continual clatter ever since.

MAM MORRIS MILL.—Has received a portion of its supplies so long detained by the floods, and has started up again. The property is still strongly guarded against the Indians. The main shaft has reached a point 420 ft from the surface, and a drift is being run to connect with the two winzes now nearing the 400 level. These two winzes both in ore all the way down, showing larger bodies than ever before encountered in the mine. Ore from the winze in the main vein, 70 ft below the 3d level, assayed $1,493. The mill and mine are in a condition to pay dividends before Christmas.

SOUTH PIONEER.—A new double compartment and well timbered shaft has been started in the South Pioneer, which is down 15 ft. The shaft is intended for the main working shaft of the mine, and it will probably strike the vein at a depth of 125 ft.

CENTENNIAD – We are advised by letter from the New York that the Centennial company would soon resume operations at their excellent property, and it is probable that a mill will be erected within a few months.

OLD DOMINION.—The smelting and hoisting works of the Old Dominion copper company have reached San Carlos, and in all probability will arrive at the mines within the next week.

NOTES.—We have learned through a reliable source that a rich strike was made one day last week on the east extension of the Rescue, and ore assaying as high as $9,-000 was taken from the ledge. This rich streak is quite narrow, being near the surface, but it is stated that the indications for widening are very favorable.

COLORADO.

MONTEZUMA.—*Courier*, Sept. 15: The Oem City M. Co., Montezuma, owns about a dozen claims in that vicinity, among which are the Monarch, Sunburst and Wyoming. The Wyoming is in litigation with the owners of the Harrison lode, but it is thought that the fight will not be a long one.

A STRIKE of a 2-ft vein of solid galena has been made in the Hunkadora lode, on Independence mountain, owned by Henry, Kehoe, Murphy & Co.

THE LITTLE JACK PROPERTY.—The crosscut tunnel which is being driven for the Little Jack lode, the western extension of the Colorado Central, on Independence mountain, is now in 90 ft, and progressing at the rate of 60 to 70 ft per month, three 8-hour shifts being employed at driving it. When the lode is reached it will be 500 ft long and over 250 ft below the surface. The shaft on the lode is about 30 ft deep, showing improvement as it goes down. The ore vein has been continuous from the surface, there being from 2 to 5 inches of ore and quartz that mills from 200 to 300 ozs of silver to the ton. Last week another regular vein, about 18 inches from the one they have followed from the surface, made its appearance, it being about 5 inches thick, and assays from 400 to 800 ozs.

WILLIAMS FORK STRIKE.—Georgetown *Courier*, Sept. 15: We have mentioned the strike of a large body of galena ore on Williams fork by Thos. Webb and others of this place. On Saturday two of the boys came over to town and brought with them a chunk of ore that weighed about 40 lbs, and assays over 200 ozs of silver to the ton. The vein was struck in an adit that had been run through slide a distance of 65 ft. The lode is called the Bobtail, and is owned by Thos. Webb, John Sanders, Cyrus Berriman & John Olds. They received an offer of $15,000 for one-fourth interest, which was refused.

BUFFALO RANGE.—Dr. R. B. Weiser returned on Saturday from the Buffalo range, and brought with him a number of specimens of ore from the lodes that he is interested in, which show the size and character of the ore veins, and prove that he has struck a honanza. The lodes are situated on Red peak.

DAKOTA.

DIES FOR THE HOMESTAKE MILLS.—Black Hills *Miner*, Sept. 12: The Homestake company has been in the habit of manufacturing here at home the iron work needed at their mills, when it was possible to do so. The stamp dies which fall upon the rock, and the bottom sinks or shoes which sustain the blows wear out very fast from almost incessant use, and have to be frequently replaced The company has been successful in casting the shoes strong enough to stand the heavy weights falling upon them; but in spite of all that has been done, cannot manufacture dies that will stand the jar—they break off at the neck. What the secret of their manufacture may be has not been discovered here, but they have to be imported at a heavy expense. Some 300 are now here awaiting transportation to the mill.

A PRIVATE HYDRAULIC ENTERPRISE.—Judge Clagget and A. J. Simmins, who have been laboring industriously for some time past in getting water on their extensive gravel claims in the vicinity of the Whitewood falls, have at last successfully accomplished their labors. Enough prospecting has been done and sufficient developments made to insure the success of their enterprise. The gravel prospects are very rich. Next spring, the very moment the weather permits, water will be turned in and work commenced at once. We have no doubt ample fortunes will reward these gentlemen for their enterprise.

MONTANA.

MOULTON.—Butte *Miner*, Sept. 13: The ore vein is large, and considerable rich ore is hoisted daily, and is accumulating for the new 40-stamp mill, which is nearing completion very rapidly. The mill will be running in a very short time.

MORNING STAR.—At this mine, to the east of Montana street, the work of sinking the main shaft to a depth of 200 ft is being vigorously pushed ahead. The new boilers afford an abundance of steam power to run the hoisting machinery and two pumps.

MOOSE.—This mine, which lies a short distance from the east end of the Magna Charter mine, has been bonded for the sum of $75,000, the bond running for the space of 90 days. The owners of the Moose—Messrs. Farrer, Johnson & Co.—have bonded the mine to S. Longmaid & Co., who, it is supposed, are operating for Eastern capitalists.

ANSELMO.—This mine, which has been so successfully opened and operated by Mr. Joe Loncaff for over one year, is looking first-rate. Loncaff's lease of the Anselmo runs about 8 months yet, and it is currently reported that he has sold the remaining time for working the mine, which expires next March, for the sum of $20,000.

ORIGINAL.—Nine men are employed. Ten tons of ore are coming out daily. First-class ore samples over 100 ozs, and second-class 40 ozs in silver to the ton.

NOTES.—The Belle of Butte is still yielding a large amount of ore daily, of good grade. The ore goes to the Silver Bow mill for treatment. Sinking the main shaft of the Star West mine progresses steadily. The shaft has been dropped over 180 ft. The Gagnon mine, famous for its steady production of high-grade ore for years past, is producing a large amount of good grade ore. Col. Thornton, who is now superintending the Gagnon, has the mine in such shape that an immense amount of ore can be readily extracted. Work at the main shaft of the Orey Rock mine is carried on without stopping. When the mine is tapped 300 ft deep, veins of as good ore as are to be found in the Butte district will be opened.

GLOSTER.—Cor. Helena *Independent:* Perhaps a few words from this lively camp would be of interest to readers. It may not generally be known that in a short time we will have 80 stamps running on the ores from the Gloster mine, more than can be found in Vestal, Mt. Pleasant, Belmont and Marysville combined, and, if I am not mistaken, it will be the largest quartz mill (60 stamps) under one roof in Montana Territory. The new 60-stamp mill now in course of construction is located at a point one-half mile below the mine. Ten more stamps will be immediately added to the present 10-stamp mill now running so successfully at the mine, which will make a total of 80 stamps. The tramway, half a mile long, to convey the ores from the mine to the new mill, to supply the 60 stamps, is now nearing completion. The credit of planning and superintending the building of this splendid mill is due to Mr. T. W. Fisher. Mr. Everett, an experienced engineer and machinist from Chicago, has arrived, and will set up and run the new engine. Mr. Skinner has charge of the construction of the tramway. Mr. Alex. Swan has control and management of the mine, mill and hoisting works. About 100 men are now employed by the company; also have a saw mill constantly running in the gulch.

NEW MEXICO.

STEEPLE ROCK.—Las Vegas *Mining World:* Everything is prosperous about the Steeple Rock district. The roads are bad at present, but it is proposed to build a good wagon road at a cost of $1,000 from the district to Lordsburg, on the Southern Pacific, the nearest railroad point. The Carlisle Co. has bonded all its properties to Western capitalists. The contract for sinking the 100-ft shaft on the Scorpion has been let and is now down 25 ft. This shows ore running 45% copper and 80 to 95 ounces silver per ton.

VERA CRUZ.—The Vera Cruz vein is located in the Tucson mountains, about 12 miles south of White Oaks, and runs in a northeasterly and southwesterly direction. The surface croppings have an inclination with the mountain side of about 45 degrees, and show for a about 800 ft in length, with an average width of from 60 to 70 ft. The croppings nearly everywhere on the surface prospect free gold in the pan. Two tunnels have been cut across the vein, one cutting it at a depth of about 60 ft, and the lower one at 120 ft. These tunnels show the formation to be true, and that it has never been disturbed by volcanic or orupttive matter. The gold is fine, bright, and perfectly free in the rock; mill run tests have been made from all parts of the vein, which prove it to average from $8 to $10 in value from wall to wall. The net profit of milling this rock with a mill at the mine will not be less than from $4 to $6 per ton, if managed with ordinary economy. Prospect wells have been dug which demonstrate plenty of water for all purposes. A company has been organized with ample capital to put in machinery especially to work the ore from this mine.

THE business men of Las Cruces have offered sufficient inducements to secure the location of the smelter which the Philadelphia Co., represented by Mr. Hoopes, contemplate erecting to reduce the ores of the Organ mountain mines, at this place.

TAOS NOTES.—*News and Press*, Sept. 12: Mining in and around Taos is beginning to assume some proportions. Several parties from the East have taken hold of mines on the Arroyo Hondo and are going to shove thing lively. On the Staples claim two shafts are being sent down 100 ft each. On the Dolo Knowell there is a 3-ft vein of mineral that will run from 200 to 300 ounces; they are getting it out and sacking ready for shipment as fast as possible. The Santa Fe Tunnel Co. are driving things lively with a fine prospect in sight; they are employing all the help they can possibly work. Many other claims are being developed rapidly and show fine mineral. On the Picuris mining has come to a system more than any other camp. Shade and Reily are putting up an improved arastra to work ore that runs $80 in gold, and 8 to 10 ounces in silver. On Rio Houdo mining and prospecting is steadily going on and I learn the mines are showing up well and all the miners there have confidence in the future of that camp.

UTAH.

DELAYS AT THE MILL.—Silver Reef *Miner*, Sept. 15: The light bullion shipment for the week, was occasioned by accident and stoppage at all the mills. The Barbee was idle from the 1st to the 8th inclusive, receiving a new cylinder head to the engine, and other repairs to the machinery. The Christy and Stormont each met with detentions on account of injury to machinery, all of which has been repaired, and are now running smoothly. The bullion product for the month will be materially lessened in consequence of this cause alone.

PARTIES up from Orand gulch report everything progressing satisfactory at that place. There is no trouble experienced by the present management in working the copper ores of that district.

Game Laws of the State of California.

We give herewith the complete game laws of the Stste of California, with all the amendments to 1881 inclusive:

These laws form part of the Penal Code of California, and come under Title XV "Miscellaneous Crimes." Chapter I of this title relates to violation of the laws for the preservation of game and fish. We give the law by sections and number as printed in the statute books, and "sub-head" the paragraphs, so that the subjcct matter is easily found. As these laws ought to he where they may he constantly referred to, hy residents of the country where fish and game ahound, we suggest that they he cut out of the PRESS and preserved.

Killing Quail, Duck, Etc.

Section 626. Every person who in any of the counties of this State, hetween the 15th day of March and the 15th day of Septsmher in each year, hunts, pursues, takes, kills or destroys quail, partridges or grouse, or any kind of duck, or rail, or marsh hens, is guilty of a misdemeanor.

Dovae.

Every person who in the State of California, hetween the 1st day of January and the 1st day of July in each year, hunts, pursues, takes, kills, or destroys doves is guilty of a misdemeanor.

Eggs of Wild Duck.

Every person who at any time takes, gathers, or destroys the eggs of any mallard, wood, or summer duck. red-head, teal, gadwell, or gray duck, or any other species of wild duck is guilty of a misdemeanor.

Having Game in Poseassion.

Every person who shall have any of the aforesaid game, or any male deer or buck, or any female deer or doe, or any antelops, elk or mountain sheep in his possession at a time when it is unlawful to kill the same, as provided by this section or hy section 628 of this Code, is guilty of a misdemeanor, and proof of the possession of any of the aforesaid game at a time when it is nnlawful to kill the same within the county wherein the same is found shall be prima facie evidence, in any prosecution for a violation of any of the provisions of this section that the person or persons in whose possession the same is found, took, killed or destroyed the same in the county wherein the same is found, during the period when it was unlawful to take, kill, or destroy the same.

627. Rspealed hy section 626.

Bucks.

628. Every person who betwcen the 1st day of Novemher in each year and the 1st day of July of the following year, hunts, pursues, takes, kills or destroys any male deer or buck is guilty of a misdemeanor.

Doe, Antalope, Elk and Mountain Sheep.

Every person who shall for the period of four years from and after the passage of this act, pursue, hunt, take, kill or destroy any antelope, elk, or mountain sheep, or female deer or doe, shall be guilty of a misdemeanor.

Spotted Fawn.

Every psrson who, after the passage of this act, shall kill any spotted fawn, shall he guilty of a misdemeanor.

Killing for Skine Alone.

Every person who, after the passage of this act, shall take, kill or destroy any of the animals mentioned in this section, at any time, unless the carcass of such animal is used or preserved hy the person slaying it, or is sold for food, is guilty of a misdemeanor.

Buying, Salling or Having in Poseession.

629. Every person who huys, sells, or has in his possession any of the game enumerated in the two preceding sections, within the time the taking or killing thereof is prohihited, except such as are tamed or kept for show or curiosity, is guilty of a misdemeanor.

Uaa of Phoephorous.

630. Every person who, in the counties of Santa Clara, Contra Costa, San Joaquin, Santa Cruz, or San Mateo, uses or distrihutes phosphorous upon any land or ground, hetween the first day of March and the first day of Novemher, in any year, is guilty of a misdemeanor.

Trapping Quail, etc.

631. Any person or persons who shall at any time net, pound, weir, cage, or trap any quail, partridge, or grouse, and any person or persons who shall sell or give away, or have in his or their possession any qnail, partridge, or grouse, that have been snared, captured, or taken, in or hy means of any net, pound, weir, cage, or trap, is guilty of a misdemeanor.

Catching Trout.

632. Every person who, in the counties of Santa Clara, Alpine, Santa Cruz, Lake, San Marin, Placer, Nevada, Plumas, Sierra, San Mateo, Monterey, Sonoma, Tuolumne, Alameda, Luis Ohispo, Solsno, Mariposa, Mendocino, or Napa, at any time, takes or catches any tront, except with hook and line, is guilty of a misdemeanor.

Close Saason for Trout.

633. Every person who takes, catches or kills any speckled trout, hrook or salmon trout, or any variety of trout, hetween the 1st day of November and the 1st day of April in the following year, is guilty of a misdemeanor.

Close Seaeon for Salmon.

634. Every person who, between the 31st day of July and the 1st day of Septemher of each year, takes or cstches, huys, sells, or has in his possession, any fresh salmon, is guilty of a misdemeanor.

Natting Salmon Saturdays and Sundaya.

Every person who shall set or draw, or assist in setting or drawing any net or seine, for the purpose of taking or catching salmon in any of the waters of this State at any time, hstween sunrise of each Saturday and 12 o'clock noon of the following Sunday, is guilty of a misdemeanor.

Cloea Season for Shad.

Every person who, hetween the 1st day of April and the 31st day of December in each year, takes or catches, huys or sells, or has in his possession, any fresh shad, is guilty of a misdemeanor.

Tide-Watar Fishing.

Nothing in this section shall he so construed as to prohibit any person from catching fish, with hook and line, at any time in the tide waters of this State.

Daleteriona Suhstancea in Watar.

635. Every person who places, or allows to pass into any of the waters of this State, any lime, gas tar, cocolns indicus, or any other suhstance deleterious to fish, is guilty of a misdemeanor; provided that sawdust shall not he deemed a deleterious suhstance.

Privata Fieh Praservas.

Any person who shall catch, take, or carry away any trout or other fish from any stream, pond or reservoir helonging to any person or corporation without the consent of the owner thereof, which strcam, pond or reservoir has heen stocked with fish hy hatching therein eggs or spawn, or hy placing the same therein, is guilty of a misdemeanor.

Standing Nats and Traps for Fish.

636. Every person who shall set, use or continue, or who shall assist in setting, using or continuing any pound, wsir, set net, trap, or other fixed or permanent contrivance for catching fish in the waters of this State, is guilty of a misdemeanor.

Saines and Nets.

Every person who shall cast, extend or set any seine or net of any kind for the catching of fish in any river, stream or slough of this State which shall extend more than one-third across the width of said river, stream or slough at the time and place of such fishing, is guilty of a misdemeanor.

Fieh too Small for Markat.

Every psrson who, by seine or any othsr means, shall catch the young fish of any species, which at the time of capture are too small to he marketed, and who shall not return the same to the water immediately and alive, or who shall sell or offer for sale any such fish, fresh or dried, is guilty of a misdemeanor.

Penaltiee.

Every person convicted of a violation of any of the provisions of this chapter shall he punished hy fine of not less than $50 and not more than $300, or imprisonment in the county jail of the county where the offense was committed for not less than 30 daya nor more than six months, or hy hoth such fine and imprisonment.

Who Recaiva tha Finaa.

One-half of all moneys collected for fines for violations of the provisions of this chapter shall he paid to informers, and one-half thereof to the District Attorney of the county in which the action is prosecuted; all other costs shall he charged against the county in which the action is proscouted.

Fish Commissioners.

Nothing in this chapter shall he construed to prohibit the United States Fish Commissioners, or tho Fish Commissioners of the State of California, from taking such fish as they shall deem necessary for the purpose of artificial hatching, nor at any time.

Forfeitura of Boats, Nats, etc.

All nets, seines, fishing tackle, hoats, or other implements used in catching or taking fish in violation of the provisions of this chapter shall he forfeited, and may he seized by the peace officer of the county, or assistant, or person acting under the Fish Commissioners, and may he hy them destroyed, or may he sold at puhlic auction hy the party making such seizure, upon notice posted in such county for five days.

Proceads of Forfeiturae.

The psrson making such seizure and sale shall he entitled to retain one-half of the proceeds of such sale, and the halance shall he paid into the school fund of the county, in case the seizure and sale is made hy a peace officer thereof, or to the Fish Commissioners, if made hy a person appointed hy them; provided, that all nets having meshes of less than one and half inches in size, when seized under the provisions of this section, must he destroyed.

California State Sportsman's Association.

EDITORS PRESS:—Your letter of inquiry as to the aims and the necessity of organization, we would briefly answer thusly: Throughout our Golden State dwell many true sportsmen who take a rnn with rod and gun for the enjoyment of the sport as *sport* and *recreation*; and with alarm at the rapid decrease of sundry kinds of game in regions where it should naturally increase, and with disgust at the selfishness of those who will not give any kind of game a chance for its life, have these same sportsmen returned home time after time. Giant powder, nets of wee, small-sized meshes, snares and spring nets, traps, and such like paraphernalia have, in some localities, well nigh made a clean sweep of fish and game, add to which a total disregard for the existence of open or close season. And what chance have we of finding in a very short time, a fish or a bird, or game of any kind in California? And, too, in a State long and justly termed the "Sportsman's Paradise." By only a limited observance of the game and fish laws as now in force, there will be enough and abundance to spare for all time. This and a natural feeling of goodfellowship, such as always exists among those of similar tastes, drew together at Stockton, as a central point, on Monday, June 27th, in Eureka Engine Co.'s hall, delegates representing ten clubs—Pajaro Valley Club, Watsonville; Folsom Club, of Folsom; Butte County Club, of Chico; Ukiah Club, of Mendocine; California Wing Shooting Club, and the Cosmopolitan Club, of San Francisco; Yolo Club, of Woodland; Stockton Gun Club; O'Neil Club, of San Joaquin, and Woodbridge Club; and a more harmonious meeting throughout cannot be imagined. A full and complete canvass of the situation was had; Constitution, By-laws and two sets of shooting rules adopted, and the intention was to have every portion of the ground so fully covered there should no question arise, bnt our by-laws and rules would cover it (we will forward you copy soon as printed). After electing as officers for the year,

Park Henshaw, Butte County Sportsman's Club, Chico, President; Dr. F. C. Durant, of Folsom Sportsmsn's Club, Folsom, Vice President; Sidney Newell, Esq., Stockton Gun Club, Treasurer; J. Pitcher Spooner, O'Neil Gun Club, of San Joaquin, Stockton, as Secretary. Directors, Crittenden Rohinson, of California Wing Shooting Club, San Francisco; J. H. Burnett, of Ukiah Sportsman's Club, Ukiah; C. H. Wyckoff, of Yolo County Sportsman's Clnh, Woodland; C. B. Smith, of Stockton Gun Club, Stockton; J. N. Besse, of Pajaro Valley Sportsman's Club, Watsonville, adjourned to meet second Monday in May, 1882, at parlors of Palace hotel, San Francisco. We have already heard from several noted clubs, among them Grass Valley Club, signifying their intention to join the association. Under our rules, none hut members of the association will be allowed to participate with us in association tournaments. Our strength at starting was most gratifying to all, and there seems no reason why the California State Sportsman's Association should not he one of mutual henefit to its members, as well as all sportsmen in our State.—J. P. SPOONER, Secretary California Stste Sportsman's Association.

Hunting Upon Enclosed Lands.

On the 3rd of March, 1876, the Legislature of California passed an act to prevent persons passing through enclosures and leaving them open, by tearing down fences or otherwise, and to prevent hunting upon enclosed lands in the State of California. We append the sections of this law, and as it is an important one to hunters they may as well cut it ont of the columns of tha SCIENTIFIC PRESS and paste it up where it can be readily found for reference:

Gata, Bars and Fancae.

Section 1. Every person who shall open any gate, hars, or fence of another, for the purpose of passing through, and shall wilfully leave the same open, without the permission of the owner, is guilty of a misdemeanor.

Fancae on Inclosed Lande.

Sec. 2. Every person who wilfully opens, tears down or destroys any fence on the inclosed land of another, is guilty of a misdemeanor.

Giving Permiaelon to Hunt.

Sec. 3. Every person who wilfully enters upon tho inclosed land of another for the purpose of hunting, or who discharges fire-arms, or lights camp fires thereon, without first having ohtained permission of the owner or occupant of said land, is guilty of a misdemeanor.

Killing or Wounding Horeas, Cows, Etc.

Sec. 4. Every person who wilfully, carelessly or negligently, while hunting or camping upon the inclosed lands of another, kills, maims, or wonnds an animal, the property of another, is guilty of a misdemeanor.

Camp Firee.

Sec. 5. Every person who, upon departing from camp, wilfnlly leaves the fire or fires hurning or unextinguished, is guilty of a misdemeanor.

Penaltiae.

Sec. 6. Every person found guilty of any of the misdemeanors herein mentioned, shall he fined not less than $20 nor more than $50, and shall he imprisoned in the county jail until such fine be satisfied, not exceeding one day for every $2 thereof.

Sec. 7. All acts and parts of acts in conflict herewith are repealed; *provided*, however, nothing herein contained shall be constructed as repesling section 594 of the Penal Code.

Recording Mining Claims.

The law of Congress requires no record of a mining claim except in ohedience to valid local rules or customs of miners; hut when such local rules or customs require a record, it must contain the names of the locators, the date of the location, and such a description of the claim by reference to some natural object or permanent monument as will identify the claim; hut such natural objects or permanent monuments are not reqnired to he on the ground located, although they may be; and the natural object may consist of any fixed natnral object; and such permanent monnment may consist of a prominent post or stake firmly planted in the ground, or of a shaft snuk in the ground. If, hy reference to any such natural object or permanent monument the claim can he identified with reasonable certainty, the record will he sufficient in this particular; otherwise, not.

The object of recording mining claims is to give notice to others desiring to locate in the vicinity. The language of the Act of Congress authorizing miners to make regulations "governing the location and manner of recording," implies that the act of location is distinct from that of recording, except where the regulations of miners mske recording necessary to constitute a location; so that a location may he complete, and vest the exclusive right of possession hefore any record thereof is made, nnless recording is made an act of location, or one of the acts necessary to constitute a location, hy miners' rnles or regnlations.

The right to a mining claim will not be forfeited hy a failure to record the same, in the absence of miners' rule or regulation providing for a forfeiture on that ground.

In the absence of any miners' rule or regulation making recording a necessary act or condition of a complete location, or providing for a forfeiture hy failure to record, a prior location of a mining claim, without recording the same, gives the locator thereof the exclusive right to possess and enjoy the same as against all persons having actual notice of such location and extent thereof.

EL DORADO.—The ditches of the Cal. W. & M. Co. are heing well snpplied with water from Loon lake. Ready sale is found for it all. Mr. Sydney De Kay, of New York city, in hehalf of himself and other stockholders, who has just spent several days in examining their property here, declares himself highly pleased with the property and the permanent improvements which are heing msde upon it under the management of Mr. Findley. We understand that the company propose to continne the work of extending their large granite dams at Loon lake until the close of another season, when it is estimated a storage four times the present capacity will have been secured. Once this is accomplished, the main ditches will he enlarged, the rates of water reduced, and a new incentive given the indnstrial welfare of this divide. Those massive structures of granite will he eternal as the hills. All who visit the works are surprised at their huge dimensions, and are enthusiastic in their praise of them. All we have said concerning this fino property is snhstantiated by all who have come from the East to inspect it, and the numher has not heen few. We have a few croakers and growlers in this vicinity, who entertain a hobhy that this property should he conductsd as it was under the old management, hut their numbers are hecoming insignificant as time unfolds to our people a hetter realization of the deep and commendable plans of improvements engaged in hy the managing director, Mr. Thos. Findley. A great enterprise like this, which is intendsd to huild up this side of El Dorado, cannot he matured in a single season.—*Georgetown Gazette.*

A MINING STAMPEDE.—A correspondent of the Nez Perce (Idaho) *News*, writing from Narrows, says: Within a few days considerable excitement has sprung up here, in consequence of reported discoveries of rich mining gravel on Big creek. However, nothing definite is known. In June last a man came here from Walla Walla, on his way thither, hut the streams were then high, and he went to Boise. He told stories of a hrother and others having wintered and washed on lower Big creek, and of $800 in dust having heen taken from there and sold in Walla Walla. Little credence was placed in his tales. Last Friday, however, a party of 33 men from Boise passed through Floyd's place, known as "Tailholt," 25 miles north of here, going to Big creek. They followed Col. Bernard's trail from the lower end of Long valley across to the head of the south fork of Salmon, then down that stream to the mouth of Secesh, then across the mountain to the head of Big creek. They were well equipped with arms, hlacksmith tools, whip-saws, etc., and apparently meant business. A party from here will leave for the same place in a few days, taking a northerly range.

DEFINITION OF VEIN OR LODE.—A vein or lode authorized to he located is a seam or fissure in the earth's crnst filled with quartz, or some other kind of rock in place carrying gold, silver or other valuable mineral deposits named in the statute. It may he very thin, or many feet thick, or irregular in thickness, and it may he rich or poor, provided it contains any of the metals named in the statute. Bnt it must be more than detached pieces of quartz or mere bunches of quartz not in place.

Soap-Making Without Boiling.

At the recent woolen exhibition at the Crystal Palace, in London, a novel process of soap-making was also shown, in which that article was produced in the presence of the visitors, without any fire or heating process whatever. Many of our readers, and especially wool growers, will doubtless read with interest the following description of the process as given in the *British Trade Journal*:— It appears that the Greenback Alkali Company, of St. Helens, have put up a small soap-making establishment, and are actually making on the spot with pure caustic potash all the soap required by the wool-scouring machines in full operation. The process is simply a mixing one. Pure caustic potash, or double-refined powdered caustic soda (dissolved in water so as to make a strong lye), is stirred in proper proportions into oil or melted tallow, producing a wool-scouring soap or a hard soda soap, according to whether caustic potash or 98% caustic soda is used for saponification. The whole establishment occupies only a few square feet, and yet the operator in charge tells us that, with only a small pan for melting the tallow, and a few vessels for holding the dissolved alkali, he could, if required, make one or two tons of soap in a day with the simple appliances before him. The soap made for the wool-washing machines is a simple tallow soap, made with pure caustic potash. The condition of the wool as coming from the machines after washing seems most excellent in color and handle, and yet without any signs of severe scouring.

This process appears worth the attention of many of our readers. Tallow at a sheep farm is certainly cheap and easily obtained; this seems to be four-fifths of the cost of this soap. It would appear, therefore, that to make this potash soap on the spot, and scour the wool immediately after shearing, would be a profitable transaction to the wool grower. Not only would the value be enhanced, but the saving in carriage and freight home on the grease (consisting of some 30% of the entire weight of the wool) would be very considerable.

Dividends vs. Assessments.

The statistician of the *Bulletin*, says the San Francisco *Stock Exchange*, furnishes some interesting figures concerning Comstock assessments during the four years ending May 1st of this year. According to this authority, in the period named there were 314 assessments levied on Comstock mines, aggregating the rather considerable sum of $27,712,910; but as an offset to this, there were $6,000,000 in dividends in excess of the aggregate of assessments, which were as follows:

Dividends, California mine	$17,360,000
Dividends, Con. Virginia mine	15,930,000
Dividends, Ophir mine	201,600
Dividends, four years	$33,491,600
Assessments, 27 mines, four years	27,712,910
Excess of dividends	$ 5,778,690

There is food for reflection in this. As the *Bulletin* remarks, had these 27 mines been worked in the interest of one men for ths past four years, fortune's wheel would still have shown a handsome surplus to risk in futnre developments. In other words, on an investment of $27,712,219 an individual would have made $5,778,690 clear profit during the four years. But it is impossible to make our Eastern friends see the force of this. They cling to the idea that it does not, or ought not, to cost anything to either search for ore bodies or reduce them into gold and silver when found. Most of them have a vague idea that a mine should be a kind of a Monte Cristo cave, where all that is needed is to shovel the wealth into sacks and pay it ont in dividends. Let them look at it in any way they choose, the Comstock balance sheet is still in favor of the stockholder.

Woman, the Queen of Home.

There is probably not an unperverted man or woman living, who does not feel that the sweetest consolations and the best rewards of life are found in the loves and delights of home. There are very few who do not feel themselves indebted to the influences that clustered around their cradles for whatever good there may be in their characters and condition. Home, based upon Christian marriage, is so evident an institution of God, that a man must become profane before he can deny it. Wherever it is pure and true to the Christian idea, there lives an institution conservative of all the noblest instincts of society.

Of this realm woman is the queen. It takes the cue and hue from her. If she is in the best sense womanly—if she is true and tender, loving and heroic, patient and self-devoted—she consciously and unconsciously organizes and puts in operation a set of influences that do more to mould the destiny of the nation than any man uncrowned by power of eloquence, can possibly effect.

The men of the nation are what mothers make them, as a rule; and the voice that those men speak in the expression of power, is the voice of the woman who bore and bred them. There can be no substitute for this. There is no other possible way in which the women of the nation can organize their influence and power that will tell so beneficially upon society and State.—*Scribner.*

Useful Information.

Interesting Statistics.

The production of agricultural implements in this country gave employment in 1850 to 5,361 hands; in 1860, to 12,867; and in 1870, to 23,251. Now the number of hands engaged in this industry is 40,680. Maine now has 282; New Hampshire, 245; Vermont, 495; Massachusetts, 646; Rhode Island, 108; Connecticut, 790; New York, 7,237; Pennsylvania, 3,097; Delaware, 71; Ohio, 10,218; Michigan, 1,978; Indiana, 2,526; Illinois, 7,870; Wisconsin, 2,700; Minnesota, 330; Iowa, 1,104; Missouri, 1,074; Kansas, 261; Nebraska, 81. Ohio has made notable advancement in this industry. In 1860 she had 165 persons employed in it and to-day has 10,248.

Alabama is as large as England, and yet has only 1,000,000 of people to England's 21,000,000. California, with less than 1,000,000 of people, is very little smaller than France with 36,000,000. We do not think Massachusetts overcrowded with 1,500,000, nor Ohio with less than 3,000,000, nor New York with 4,500,000; and yet, if Texas were settled as thickly as New York, its 1,000,000 would grow to 22,000,000; if like Ohio, it would have 21,000,000; if like Massachusetts, it would hold 52,000,000, or more than the whole present population of the Union. There are only 15 States out of the 38 which have each more than 1,000,000 of people, while there are 11 States which have a larger area than England with her 21,000,000. Settled like England, these States would have more than 300,000,000. The States toward which emigration is now mainly setting are Minnesota, Nebraska, Kansas, Texas and Colorado. These about equal Missouri in population, while their area is ten times hers. So, to be evenly populated like Missouri, sparsely populated as that State is, these five should have 29,000,000; and to be settled like Massachusetts, being ninety times as large, they must have 135,000,000, or three times our country's present population. If the whole territory of the Union was settled like New York, it would contain 270,000,000; if like Massachusetts, 560,000,000; and if it reached England's ratio of inhabitants to the square mile, its population would almost equal the present population of the globe.—*Exchange.*

Discovery and Uses of Water-Glass.

Von Helmont, in 1640, found that when, in making glass from sand and alkali, an excess of alkali was used, the glass would dissolve in boiling water. In 1827, Von Fuchs utilized water-glass, soluble glass or silicate of soda, in stereochromy or solid color-painting, in monumental and mural decoration, and in the preparation of cements and artificial stones. London *Engineer* suggests that, although used for a large number of purposes in the arts, it is capable of more extended application when it becomes better known. A compact, marble-like stone is formed when it is mixed with chalk and is dried. Similar stones are formed by mixing water glass with bone-ash, zinc-white and magnesia. Ransome's artificial stone is prepared by mixing sand with water-glass solution, to form a plastic mass which is then pressed into the required shapes and placed in a solution of calcium chloride: the silicate of calcium thus formed cements the grains together, and the chloride of sodium formed at the same time is removed by washing with water. With clay, lime, sand, cement, etc., soluble glass enters largely into the composition of many of the patented artificial stones, plastic tiles, slates, etc., and also of our common soaps, the detergent qualities of the glass making it an excellent scouring material. In cold water this glass is nearly insoluble, or dissolves very slowly, but in boiling water it dissolves with facility; and remains in solution after the water has cooled. If the water contains 30% of the glass in solution, we have a substance of a sirupy consistence, which may be used as a transparent varnish on many substances; on drying, it forms a glassy coating that fairly resists moisture and change of temperature. *Engineer* remarks that, although the *Scientific American* says it has been used extensively as a vehicle for certain pigments to form paints known as silica paints, oil and the other common ingredients are used as the vehicle in the paints known and largely used by that name in England.

Leatherette—Its Manufacture and Uses.

One of the many articles made of paper material, which is gradually coming into general use, says the *Paper World*, and for which something else gets the popular credit, is leatherette, which is manufactured by the Shawmut Manufacturing Company of Boston, at Turner Falls, Mass.

It is being brought into use in so many ways, and is at once so susceptible of beauty and economy in various mechanical and ornamental appliances, that we may well give something more than a passing notice of it. It is so perfect an imitation of leather that its use is time and again had, without its users being aware that they are handling something other than leather itself, and its serviceable nature renders the detection still more difficult. For all uses to which it has yet been applied it is nearly, if not quite, equally serviceable with leather, and gives excellent satisfaction to those who have occasion to use it or to deal in it.

It is only in this country that leatherette, the real, genuine article, is made. The Japanese are the only people who manufacture an article to be at all compared to our American leatherette, and although they make an excellent imitation, the price of their material is high and they copy but few grains and colors, while our leatherettes can be made to imitate any grain of leather, and in any conceivable color, so much so that it has rapidly grown into popular use in a great diversity of purposes, among which are book and pamphlet binding, silver, jewelry and all kinds of leather cases; fancy boxes for papeteries, pocket-books, trunk linings, boot facings, table and desk coverings, wall paper, letter-files, chess-boards, etc., and its durability has been proved by its use for covering whip handles.

As its name implies, it is a close representation of leather, so close that good judges are often deceived, and requires a thorough examination to detect its true nature, and when used in the different trades it answers the purpose to which it is put equally well with the real article. Being made of paper, it enters only into competition with leather when it can be fastened to some more solid substance than itself, as, for instance, cloth for belts, wood for boxes, leather for inner sole linings, or pasteboard for book binding, although for flexible covers it answers without any support. Its surface wear is remarkably durable, as it is made on the same principle as oil-cloth. Numerous imitations have been on the market for several years, but no exact imitation of leather has ever before been accomplished. The genuine leatherette, though unknown, even in name, only a few years ago, has now become an established article of trade, and taken a notable place among our American industries.

Coffee Syrup.—Take half a pound of the best ground coffee, put it into a saucepan containing three pints of water, and boil it down to one pint; boil the liquor, put it into another saucepan, well scoured, and boil it again. As it boils add white sugar enough to give it the consistency of syrup; take it from the fire, and when it is cool, put into a bottle and seal. When traveling, if you wish for a cup of good coffee, put two teaspoons of the syrup in an ordinary cup and pour boiling water upon it, and it is ready for use.—*Caterer.*

Stain for Brown Oak.—Mix together two ounces of pearlash and two ounces of American potash in a quart of warm water, and apply to the parts to be stained; a very little red sanders in your polish improves this stain. Some polishers use bichromate of potash, weak, for this stain, but I prefer the former. Always stain before oiling your work, and the stain strikes deeper into the wood.

Good Health.

Laws for Hair.

The general law for the care of the heir is cleanliness. But this essential condition is not always to be brought about by the same methods. In some cases the scalp and the hair itself require washing as often as once every month; in other instances, once in three months is sufficient. When the hair is in a healthful condition the glands at the roots are strong and vigorous and supply a natural oil. These glands often become obstructed or weak in their action, and finally dead. So long as they are inactive through obstruction or weakness, the hair may be restored, but when they are actually dead, and the scalp assumes a shining appearance, nothing will remedy it. Baldness may be prevented; it cannot be cured.

The obstructions are to be removed first by thoroughly washing or shampooing the head. This is to be done by using water and castile soap as warm as it can comfortably be applied. It must then be thoroughly rinsed. Three or four rinsings with tepid water are not too much. After this cleaning the hair for a day or two is apt to be harsh and dry. Special attention should then be given to rubbing and brushing the scalp. One of the most effectual methods to keep the glands in good working order and to bring out the oil, is to rub the head gently (either night or morning, when you have the most time to devote to its care) with the balls of the fingers. In this way the hair is not only separated, and the air allowed to pass through it, thus drying it from an unpleasant moisture, but the pressure upon the secretions of oil causes activity and brings it to the surface.

The hair should be thoroughly brushed every night or morning with a brush of good stiff English bristles. Wire brushes irritate the scalp and are very detrimental. For the same reason fine-tooth combs should not be used. It should always be remembered that while friction is necessary, irritation is to be avoided. Excessive irritation will itself produce dandruff, the most common of the scalp diseases, and often the forerunner of those of more serious nature. In cases where the dandruff is excessive, and of a dry, scaly nature, the scalp should often be washed, and always carefully. But even in such instances the hair itself requires occasional washings to cleanse it from dust. In such instances it is necessary to apply some safe and reliable wash, which should be free from oil. After the dandruff is removed, proper care and attention will promote luxuriant growth, and where there is not actual baldness, will restore natural vigor.

In order to keep the hair healthy it is essential that it should be trimmed about once a month. Merely chopping off the ends does not answer this purpose. The hair should be examined under a microscope and every end that is split—all hair splits after a time—should be trimmed off. These split ends are dead hair, and no matter how scanty the hair is the sooner one is rid of this much of it the better. The first time it is trimmed in this way, from a quarter to half an inch should be removed: after that only the extreme ends need be cut.

In regard to dressing the hair, the crown of the head should be kept free. The practice of parting it at the sides, just above the ears, and pulling it toward the top, is very injurious, making the crown soft and tender and the hair diseased. Crimping the hair may be done without much injury if great care is used. Instead of braiding in 10 or 12 small, tight braids, there should be but two. The buttons at the back of children's dresses, or sprons, often ruins the hair by snarling and breaking it, and luxuriant curls or flowing tresses have sometimes to be shorn close just for this reason. The prevailing notion is that children's hair should always be cut. But, if the child is perfectly healthful and the hair good, it is only necessary that the ends should be carefully trimmed every month. For delicate children, the hair should be kept cut close till they are 12 or 14 years of age. The most sensible and healthful style for girls for school and ordinary wear is to braid it firmly and leave it hanging down the back.—*Food and Health.*

Why We Commence Dinner with Soup.—The rationale of the initial soup has often been discussed. Some regard it as calculated to diminish digestive power on the theory that so much fluid taken at first dilutes the gastric juices. But there appears to be no foundation for this belief. A clear soup disappears almost immediately after entering the stomach, and in no way interferes with the gastric juice, which is stored in its appropriate cells ready for action. The habit of commencing dinner with soup has, without doubt, its origin in the fact that aliment in this fluid form—in fact, ready digested—soon enters the blood and rapidly refreshes the hungry man, who, after a considerable fast and much activity, sits down with a sense of exhaustion to commence his principal meal. In two or three minutes after he has taken a plate of good warm soup the feeling of exhaustion disappears, and irritability gives way to the gradual rising sense of good fellowship with the circle. Some persons have the custom of allaying exhaustion with a glass of sherry before food—a gastronomic no less than a physiological blunder, injuring the stomach and depraving the palate. The soup introduces at once into the system a small installment of ready digested food, and saves the short period of time which must be spent by the stomach in deriving some nutriment from solid aliment, as well as indirectly strengthening the organ of digestion itself for its forthcoming duties.

Know Thyself.—Horace Mann justly remarked—"A spendthrift of health is one of the most reprehensible of spendthrifts. I am certain I could have performed twice the labor, both better and with greater ease to myself, had I known as much of the laws of health at 20 as I do now. In college I was taught all about the motions of the planets as carefully as if they would have been in danger of getting off the track if I had not known how to trace their orbits; but about my own organization, and the conditions indispensable to the healthful functions of my own body, I was left in profoundest ignorance. Nothing could be more preposterous. I ought to have begun at home, and taken the stars when it should come their turn. The consequence was, I just broke down at the commencement of my second college year, and have never had a well day since. Whatever labor I have been able to do has been done only on credit, not on capital—a most ruinous way, either in regard to health or money. For the last 25 years I have been put from day to day on my good behavior, and during the whole of this period, as an Hibernian would say: 'If I had lived as other people do for a month, I should have died in a fortnight.'"

In spite of the magnificence of the domestic arrangements of the ancient and refined care bestowed upon all that could make life agreeable, they were without many of the most ordinary conveniencies. For instance a clock to regulate time, to us an indispensable piece of furniture, which a man of the most moderate means can command, and even the poorest does not like to be without, was for nearly 500 years unknown in Rome, and even in latter times only in a very imperfect state. According to Pliny there was no sun-dial in Rome until 11 years before the war with Pyrrhus, although in Greece they were in use somewhat earlier, about 500 B. C. Water clocks came into fashion later on; but there was no idea of accurate time keeping, and in order to know the hour, without giving themselves any trouble, the patricians kept slaves for the express purpose of watching the dials and reporting each time the hour expired.

Last Monday, says the *Foothill Tidings*, the builders completed a new quartz mill at Timbuctoo, in Yuba county. The mill will be used for the reduction of ore from the Marc Antony mine. The mill and mine are owned by Mr. M. T. Brewer, of Sacramento, and Mr. R. G. Hart, of Grass Valley.

London.—The population of London nearly equals New York, Philadelphia, St. Louis, Chicago, and Boston combined.

MINING AND SCIENTIFIC PRESS

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SAN FRANCISCO:
Saturday Morning, Sept. 24, 1881.

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Passing Events.

As we write, Thursday, the first indications of the approach of winter are at hand. The wind is south and the rain falling. This first rain of the season is much earlier than usual, and it will be somewhat strange should we have more before the middle of October.

The death of the President is naturally the all-absorbing topic of the week. On Tuesday, the banks and exchanges were closed, and they will close on Monday, the day fixed for the obsequies, in accordance with the recommendation of the Governor in his proclamation, which we print in another column. Thus business is interrupted and the minds of all turn to the sad themes of the assassination, the lingering illness and the death. Sorrow is widespread and genuine. Rancor, partisanship, sectional feeling, in short, all narrow thoughts have been laid aside, and for the last two months the popular atmosphere has been purer and clearer than usual. The nation has apparently been living a higher life, and the suffering of the President, though grievous to be borne, has not wholly been in vain. It is to be hoped that the influence of the event will linger long in the hearts of the people.

The new President is in his office. Chester A. Arthur, chosen Vice-President, took the presidential oath at the hands of the Supreme Court judges in New York city, early on Tuesday morning, and entered at once upon the discharge of his duties.

Our "Mining Summary" will give all the news there is from the mining regions. Means are being taken to relieve the heat in several of the Comstock mines. Up at Enreka a strike in the tunnel encourages them all, and we hear of new placere being found in Montana.

Complex Auriferous Ores.

A new process, the invention of Messrs. Molloy and Warren, for treating complex (or rebellions) auriferous ores, is attracting some attention in England, and considerable space is devoted to consideration of it in some of the technical journals. As far as we can understand it without an opportunity of reading the specifications the object of the process is the extraction of gold and silver from ores which are of a refractory character, such as tellurides, pyrites, arsenical pyrites, etc., and which can be only partially treated by the ordinary methods. By ordinary analysis by the wet process (*i. e.*, dissolving out with nitro-hydrochloric acid) it is known that all the gold and silver can be extracted from any refractory ore. If, therefore, such ores could be treated in quantity by the same means, then it is evident that all the gold and silver would be got out. It is this the process is intended to accomplish, and the possibility of doing so is said to have been demonstrated at the works in Liverpool. As to cost, it is claimed that the expensive solvent—nitric acid—can be used over and over again with only a fractional loss, the inventore claiming to have discovered a method by which this can be done.

The process is thus described: It consists in first crushing the ore, which is done by the aid of the Beaumont direct-actuag steam stamp, which is similar in principle to the steam hammer. It is double acting, with a six-inch cylinder and an 18-inch stroke. It has a steam driven valve, by means of which the blow is accommodated to the thickness of the layer of ore under the stamp-head. The ore is then concentrated and roasted in a small reverberatory furnace. When roasted the ore is placed in a stone-ware tank, heated by steam, and there subjected to the nitrohydrochloric solvent and treated. All the gold and silver is then dissolved out, and the solution, when charged, drained off into a second tank and allowed to settle. The clear solution is then tapped into the precipitating tank, in which by means of sulphurous acid the gold is precipitated as a fine powder, which has then only to be put into an ordinary crucible and melted into gold bar. The silver, if any, is obtained by washing the residual ore, precipitating the results, and treating it in the same way as the gold, and is obtained in a bar with equal facility.

San Bernardino Mines, Etc.

Mr. Ed. Lawson, of San Bernardino, formerly a printer in this office, recently called in, and on inquiry gave us the pleasing information that business prospects in his town continue very promising. The agricultural outlook is remarkably good. Several mining districts, relying upon the town as a base of supplies, are assuming greater importance. The new mines on the Mohave desert are developing wonderfully. R. M. Waterman's mine is supposed to have been one of the wonderful discoveries reported by the "old man Lee" on the desert. A few tons of the ore shipped to San Francisco are said to have produced sufficient bullion to place a mill on the ledge. Mr. Waterman promptly refused an offer from leading San Francisco capitalists of $550,000 for his principal mine. Mr. Waterman considers there are "millions in it." We personally know Mr. Porter, who is associated with Mr. Waterman, to be an experienced mill man, and are much gratified to learn of his and Mr. Watsrman's success. The "King mine," in the same neighborhood as Waterman's (70 miles from San Bernardino), has recently been bonded by Sheriff King for $300,000. The rock is said to assay from $400 to $2,000 per ton. The Hartman, and other mines, are also accounted extraordinarily good.

Mr. Lawson's firm (Lawson Bros.), it is a pleasure for us to state, are doing well in the news, stationery and variety business, and hold a good standing in the community in which they have long been favorably known — facts the writer learned with gratification during a brief visit in San Bernardino.

Gov. TABOR, of Colorado, says the New Mexican *Mining News* of Sept. 14th, has struck it rich again. Last Friday, a mine which he was having developed under bond opened into a true fissure—a vein 40 ft. wide, with 6 ft. of pay streak, the latter running 600 ounces to the ton, the second and third grades running 300 and 100 ounces respectively. The Governor bought his bargain of a couple of Maine Yankees who sold him a mine for $100,000 worth many millions.

THE Washington *Herald* says: Gold and silver mining stock companies are becoming an institution peculiar to the enterprising capitalists and business men of Washington. Several companies for the development of the rich gold and silver mines of Arizona and New Mexico Territories have been organized in Washington within the present year.

The Nation's Loss.

The President is dead. For 80 days the country watched with longing eyes for every indication that his precious life would triumph over the wretched stroke of the assassin and has balanced hope and fear with almost affectionate anxiety. Meantime with heroic fortitude he has borne indescribable pain, and with brave heart awaited the result, longing to live and yet not afraid to die. And now he has gone hence, leaving to the country a rich legacy in the memory of a noble life and the example of high and disinterested patriotism. To-day the people mourn. The emblems of mourning are fixed upon a nation's homes and marts, along the country roads and beside the city streets. Everywhere hearts are heavy with the sense of the nation's bereavement.

James Abram Garfield was born on November 19, 1831, in the district known as the Western Reserve, about 15 miles from Cleveland, Ohio. His father, Abram Garfield, was a hard-working farmer, but the rough pioneer labor exhausted him before his prime. The mother was a woman of large frame and strong common sense. Of four children James was the only one who betrayed uncommon capacity. The elder brother is now a farmer in Michigan and the two sisters

THE LATE JAMES A. GARFIELD.

farmers' wives. In James, to the father's passion for work was added the mother's desire for knowledge. He worked early and late, but all his efforts were put forth to get an education. Labor on the farm through the summer, work at the carpenter's bench during the winter filled up his time, but, unlike his companions, he was never satisfied with this life. He had a strong desire to go to sea, and he walked 40 miles to Cleveland to ship on one of the lake craft. The captain swore at him and he retired discomfited, but compromised his nautical longings by hiring out as a canal boy. He drove the horses, and after a season of this apprenticeship was allowed to take charge of the helm of the boat. In the winter he turned his hand to any rough farm work. But even this active life could not satisfy him. He felt the stirrings of ambition—he had a consuming desire for knowledge. With a small amount of money which he got from his mother he set out for the nearest school. Here he studied hard, supporting himself by work at the carpenter's bench at morning and evening, and teaching school during the winter months. At 23 he concluded that he had gained everything possible from the academy. He had saved up money enough to carry him through one year at college. So, with that energy which always characterized him, he insured his life, made over the policy to a business man for a loan of ready money, and thus equipped, started for Williams College. In 1856, Garfield was graduated from college, receiving one of the best honors. On his return home he accepted the position of professor at the College of the Disciples, in Hiram, Portage county, Ohio. After two years of this work he was elected President of Hiram college. While a professor, he married Miss Lucretia Randolph, the daughter of a farmer in the vicinity, whose acquaintance he had made while preparing for college. They married because they loved each other. Neither had money, but the young girl sympathized with Garfield's tastes and aspirations; she encouraged his ambition and stimulated him to study and reading by her own scholarly tastes. In subsequent years he has acknowledged that no small share of his success in life has been due to her unwavering faith in him, and the encouragement which came from her intelligent companionship and womanly devotion.

The young college President was elected in 1859 to the State Senate of Ohio from the counties of Portage and Summit. The summer of 1861 saw him a Colonel, in command of the Forty-second Ohio Infantry — a regiment largely composed of his friends and of the students of the college. His army record is full of honors for honorable service, and he rose to the rank of Major-General. While in the field, Garfield was nominated for Congress and elected by a large majority, in December, 1863. He showed at once that, though unpracticed in parliamentary tactics, he was no mean antagonist in debate. Before the first session was over he had won an assured place in the regard of his associates, and had made his mark as a ready debater. He showed in his first session a great fondness for the study of financial questions, and when appointed later on the Ways and Means Committee, he did good service in enforcing his idea of specie payment. He never wavered in his convictions, nor faltered in defense of what he regarded as the only safe financial policy of the government. In January, 1880, he was elected to the seat in the Senate which was then occupied by Allan G. Thurman, whose term expired March 4, 1881. After Garfield's nomination for President by the Chicago Convention on June 8th of last year, he resigned his seat in the Senate to which he had been called, but which he never occupied. He was elected President by a decided majority, and inaugurated March 4, 1881.

The events of the last summer are too fresh in the minds of the people to need rehearsal. None can forget the darkness of that Saturday, July 2d, when the news was spread abroad that the President had fallen at the hand of a miscreant; none can forget the long days of suspense from that time until the patient sufferer was released.

Tributes to the worth of the dead President will occupy the tongues and pens of orator, poet and historian for a long time to come. Just at the moment, it is difficult to frame fitting praise, but the following from the New York *Tribune* is excellent:

At the very moment when he was stricken to the earth he was considered among the most acceptable of all the rulers of the nation. His ability, his statesmanship, and his personal purity of character, were recognized by all. He was esteemed as an example to all who claimed a share in the honor that such a ruler bestowed upon his country, and would also share in the brilliant prospects of his administration. He stood confessed as one of the foremost men of the age. The great chieftain, and what is more, the Executive of a great people, has been stricken down in the moment of his fame. Long will he be lamented. Long will the atrocity of his fate be cited in future times. Generations yet to follow will forever link the name of Garfield among the brightest and most glorious of the rulers of the American people. By the side of the name of Abraham Lincoln the American people have now reverently inscribed James Abram Garfield. These two great names will live forever in history. As they mourned Lincoln, they will mourn Garfield, with a feeling of reverential tenderness, with gratitude for the example of his lofty, pure life, and with pity for his cruel, untimely death.

It is fitting as we mourn for the dead, that we should express sympathy with those whose personal loss is greater than ours can be—the honored mother, heroic wife and beloved children. The President loved his family with a love which is a shining example for a nation of sons, husbands and fathers. As a contemporary writer says: He died as a pure, upright Christian would prefer to die, with an unblemished record, wholly unmindful of personal pain and the abrupt termination of his highest political hopes, and grieving only for his cherished wife and children, whose love and affection made his home an earthly heaven. Around his bedside the American people have for weeks gathered in sympathy and prayer. To-day the same people will mingle their tears with those of his venerable mother, his wife and children, as members of one common family, mourning one common father and friend.

Holding of Placer Mines.

The United States laws relative to the location and possession of quartz mines or mineral-bearing veins of any kind are definite. The claimant must define his claim on the ground, post and have recorded a notice of location, stating what is claimed and for what purpose and to remain in possession prior to obtaining title by United States patent, must do yearly $100 worth of work on the claim.

In the case of the placer mines, the laws of location require equal definiteness in defining the claim on the ground and in posting and recording a notice of location. There is, however, absence of any direct specific law requiring work to be done on placer claims to hold possession. As a consequence, large areas of valuable placer mining ground are held by speculators on paper titles. Only a notice of location; no work, or very little, being done. Most, if not all of these claims are held by men who have, nor ever will, expend a single dollar on their exploration or development, nor will they permit others to do so. If one of these claims is relocated with the intention of working the same, the first claimant with his paper title, steps in and threatens litigation. This state of affairs unquestionably operates to the disadvantage of legitimate placer mining. The laws regulating quartz mining work well, and Congress should enact laws placing mining on as near as possible the same footing.

A SALT LAKE man has signified his intention of putting up six sawmills in Montana next spring. He thinks the demand for lumber will justify it.

Lead Bath for Ores.

The following paragraph, which originally appeared in the letter of the New York correspondent of the San Francisco *Bulletin*, is now going the rounds of the press:

"It may be interesting to your readers to know that a company has just been organized for the working of a new ore extracting process, by which it is claimed that ore worth $5 a ton can be profitably treated. The company is now at work putting up works in New York here, and expect to begin operations very soon upon some tailings from the Comstock mines. The process is as yet a secret. I understand, however, that melted lead has something to do with it, and that it is wonderfully cheap and effective compared to all known methods of ore-extracting. The properties of molted lead in its action toward gold and silver are extremely curious. Not every one knows, for instance, that if a bar of solid gold as big as a man's finger is plunged into a bath of melted lead it will melt instantly—so quickly that it cannot be withdrawn. Yet the melting point of lead is about 600° and that of gold 2,518°. Another curious fact is that if into a bath containing a ton of melted lead a $20 gold piece, or any other bit of gold is thrown, and the whole mass is congealed as fast as it can be done, the gold will be found equally distributed. A sample cut from the outside of the mass will assay the same as one cut from the heart of it. It was the knowledge of these facts that led miners to pulverize ore and plunge it into melted lead. But the pulverizing is a long job, and profitable only when the ore is rich. The new process is said to be perfect, and the talk about it excites no little interest among investors of mines."

There is much bosh in the paragraph given, but its worst effect is in inducing people to believe that a new process for profitably working low-grade ores by means of melted lead, has been devised. In the first place, processes for working ores by means of melted lead are as old as the hills. In the second place, dozens of them have been tried, and failed in point of economy and convenience. Quicksilver is way ahead of lead, requiring no fire to keep it fluid, more easily kept clean, and handier in every respect.

Every now and then, however, some genius comes to the front, who is going to revolutionize things by using molten lead, and every time he does it he fails. It has been tried here a dozen times. Only last summer some thousands of dollars were sunk in a metallurgical experiment of this kind in this city, and the people who invested in the thing thought the whole idea was new. The writer warned them at the time of the inoperativeness of the system, but they thought the lead would absorb gold and silver from the ore and the sulphurets, and save concentration and chlorination. It also absorbed several $20 pieces of the investors, and, as the correspondent above asserts, these "twenties" were well distributed. So well that they never got them back. The appliances are now here and may doubtless be procured cheap.

To prove that this is not at all a new idea, it is only necessary to look back a little. As long ago as 1829, John Henry Vivian, R. S., published in the "Record of Mining," a paper on "The Smelting of Silver Ores" as then practiced on the continent of Europe, and in that he described in great detail the various means of smelting auriferous silver ores for matte and extraction of the precious metal by a bath of melted lead, and at that time they had been in vogue several years. John Arthur Phillips, in his "Mining and Metallurgy of Gold and Silver," published in 1867, describes the system also, and in the chapter on the concentration of the precious metals in metallic lead, a great deal is said.

Of course we understand that in the various processes which have been adopted for the extraction of the precious metals from their ores by smelting, advantage is taken of the affinity which lead possesses for them when in a molten state, and consequently it performs when in that condition a similar service to that rendered by the mercury at lower temperatures. From the great facility with which the sulphides of silver are converted into an impalpable powder, which, by floating off on water becomes commercially lost. The mechanical concentration of silver ores is a very wasteful operation; and hence the solubility of sulphides of silver or the fused metallic sulphides are made use of as a means of concentration. The gold present in the ore is also concentrated in these metallic sulphides.

But when you come to pulverize ore and pass it unconcentrated ton after ton *continuously* through a bath of molten lead, there are many practical difficulties to overcome. It seems to us that if this New York Company is going to work Comstock tailings by this process it will have a job on its hands to make any money. It will take all they get out of each ton to keep up the fire under the lead.

From our remembrance in having looked this subject up and in the patent office reports, we call to mind a few instances which will show what has been done in the United States:

In 1866, a man named Tripp, patented a method by which the ore was delivered in a tube, and a heavy metal screw carried it under lead in a cylinder.

In the same year, the same inventor patented an upright cylinder, with revolving shaft, having spiral blades on the lower end for distributing ore at the bottom of a lead bath.

He also patented another arrangement by which the ore was conducted to and disseminated at the bottom of a lead bath by means of revolving tube, with cylindrical bottom and openings for escaping ore.

Then, in 1868, Tripp got another patent on a tube going into the bottom of the lead bath. The ore came out of the orifice into the bath. The central stationary cylinder was jacketed in an outer revolving one.

Fuller, in 1868, got up a similar arrangement and patented it.

In the same year, an inventor named Brown patented a device. He had a vessel with hollow rotary shaft with apertures at the lower end enclosing a stationary tube leading from the hopper above. Teeth were attached to the outer shaft between corresponding teeth on the inner side of the same. He had both a revolving and stationery shaft for forcing quartz into molten lead.

In 1866, Hamilton improved the Fuller patent before referred to by arranging a conical tube into a funnel-shaped hopper with a peculiarly constructed deflector at the bottom to prevent those adhering to the sides of the tube.

In 1867 a man patented a hulh-shaped vessel containing a lead bath and supported in a furnace. A tubular conductor led the ore down, and a shaft on the tube had grinding plates on the lower end.

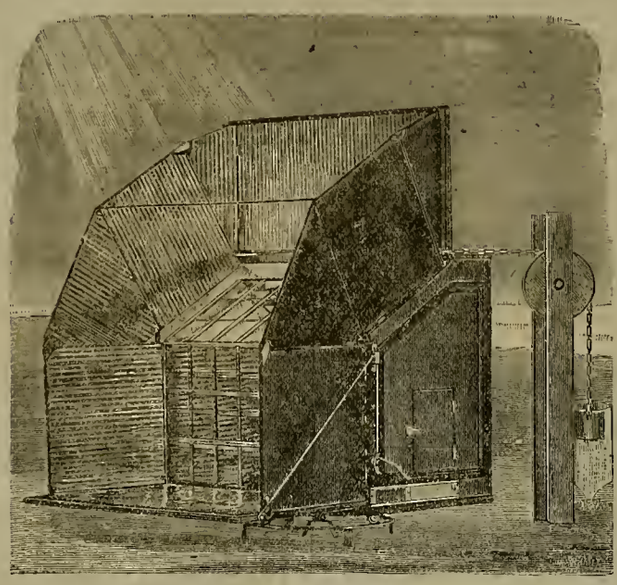
This for example will show that the idea of using lead for catching gold and silver is not new, and that it has been very fully experimented with long ago. Had any one of these processes been at all successful, it would have been in use to day. As none of these, or others, are in use where unconcentrated ore is passed through a lead bath, it is natural to presume that the process was not a practical one from an economical point of view.

Solar Heat Fruit Drier.

The engraving on this page shows a new and interesting arrangement for fruit and vegetable drying by solar heat. The principle is to concentrate the sun heat by means of reflectors upon the fruit which is spread upon trays in a chamber with a glass front. The manner in which this is done is quite apparent from the engraving. The fruit is introduced upon the trays through the back of the cabinet. The door shown on the side in the picture is to permit the operator to enter in case the glass should need polishing on the inside, or something of that kind.

The machine is mounted upon a center pivot, about which it rotates so as to face the sun, and thus obtain the full benefit of the sun's heat. The device for rotating is quite simple and inexpensive. A barrel is filled with sand or fine dirt. A cord coming from one corner of the machine passes over a pulley, and a weight on its opposite end rests upon the sand or dirt in the barrel. A spigot allows the sand or dirt to run out of the barrel slowly, and as fast as the level of the sand lowers, the weight descends and turns the machine. This is so simple it can be understood by anybody. It is to be used when the machine is filled with fruit and left to operate itself. In ordinary use, when someone is at work near at hand, all that is necessary to do is to move it a little toward the sun with the hand. As it rests upon a pivot and turns on friction wheels, it moves with very little force. The philosophy of the drier is set forth by the inventor as follows: Sun heat is powerful and costs nothing and is ready for use in this climate during the whole fruit season. Fuel for fire drying is expensive, and the labor of keeping up the fire considerable. Sun heat generates no smoke or gases, and cannot impart any disagreeable flavor to the fruit as is sometimes done by fire drying. The fruit is wholly inclosed in the drier and therefore cannot be attacked by egg-depositing insects and cannot breed worms. As it costs nothing to secure heat the drier can be started on any amount of fruit, however small, while with the larger driers it does not pay to fire up, unless the machine can be kept well filled with fruit. For these reasons the drier is adapted to use on either a small or large scale. It is also noted that the solar drier requires no building and can be set out in the orchard anywhere the sun strikes. At night the reflectors fold back over the face of the cabinet and thus maintain warmth and aid to keep the fruit from any influence of damp night air.

The solar drier is the invention of E. F. Ely, but the whole rights for this country have been purchased by G. B. Davis, 1619 Webster street, S. F. The machine is a brand new invention, and is just being introduced.



ELY'S PATENT SOLAR HEAT FRUIT DRIER.

A New and Favorable Field for Hydraulic Mining.

As is generally well known, most hydraulic operations throughout the more central mining counties of the State, have for some months past been stopped, and still remain suspended, by reason of restraining injunctions issued against these companies at the instance of the farmers. These proceedings have had a tendency, no doubt, to inconvenience and work serious injury to others than the parties defendant.

Besides the detriment to the mine owners themselves, and to the business community at large, there are other considerations that render the closing down of these mines just at this time, peculiarly unfortunate.

Owing to the many failures that had attended their mining ventures elsewhere, the attention of Eastern capitalists had begun to be strongly attracted towards properties of this kind, which, but for this set-back, promised soon to grow into favor with that class of investors with whom moderate profits, coupled with long and well-sustained production, are controlling elements. Deterred by this controversy between these two leading interests, but little capital has been embarked in our hydraulic mines for a year or more past.

While it may be conceded that this abstinence accords with the dictate of prudence in so far as the central mining counties are concerned, it should at the same time be remembered that a large section of country covering much of the best hydraulic deposits in California, enjoys an entire immunity from these disturbing questions that have so set the farmers and miners at variance and put an end to present operations in the older hydraulic districts of the State. This country lies along the Klamath river and its tributaries, extending, also, to some of the other streams in the group of counties that occupies the northwesterly angle of the State.

The deposits of auriferous gravel throughout that region are not only rich and extensive, but they exist under conditions so supremely good, that in no event could they have much longer escaped the notice of parties desirous of engaging in this branch of mining. And now that there is so little prospect of further sales of hydraulic grounds being effected just at present in the districts to the south or of any new enterprises being inaugurated there, until these differences between the farmers and the miners are adjusted, we take occasion to say that no better opportunities were ever presented for obtaining eligible properties and engaging in hydraulic mining than can at this time be found along the Klamath river, beginning at the mouth of Scott's river and extending thence 50 or 60 miles down stream.

It is not necessary to speak here of individual claims or particular localities, this object of this writing being to simply notify this investing public of the existence of this, but partially occupied and little appreciated field lying off in that remote corner of the State. It may be added, however, that among the favorable conditions alluded to are to be enumerated, ample fall or outlet for insuring effectual riddance of tailings, and that without the latter causing any damage to farming lands or any other interest or industry whatever; also, an abundance of water, with unexampled facilities for conveying the same in large volume and under any desired pressure to points where required for use, these ends being accomplished through a length of ditch averaging hardly more than eight or ten miles. The season of active operations in that region is apt to be long. The ditches, as a general thing, run full of water all summer, the supplying streams having their sources in the tall mountains near by, on some portions of which the snow lies all summer.

The gold-bearing gravel deposits, besides being extensive and of good grade, are entirely free from overlying volcanic or other barren matter, as well also as from imbedded pipe clay and the presence of hard cement. So little trouble has been given by unwieldy bowlders that it has not as yet been found necessary to erect a single derrick for handling them. While there occur many buried channels up there, the side rims of these "dead rivers" have in all instances proved to be so low that outlet and drainage have been effected by means of open cuts alone, no deep bed-rock tunnel having ever yet been driven in Siskiyou county, where the most of these comparatively virgin mines are situated.

As the question of damage to the farming lands, impediments to navigation or the filling up of harbors has never arisen, so is it likely to never come up there, for the good reason that there are no farming lands along the Klamath, the only outletting stream for that region, exposed to be damaged by the mining debris. As the Klamath itself is not a navigable river, discharging directly into the ocean, this waste matter from the mines, however much there may be of it, cannot interfere with the interests of commerce or shoal the waters accessible by any sailing craft whatever. From all these troublesome questions, now causing so much ill-feeling and costing so much money further south, these Klamath mines will enjoy entire and perpetual immunity.

As the owners of these properties, where they have been worked at all, have been content to outfit and operate them in a small way, they do not, as a general thing, set any very high prices upon them; good water franchises can also be secured at moderate figures: and as lumber, together with most other needed material is inexpensive, the entire cost of opening up and equipping a first-class hydraulic mine is, in that part of the State, comparatively small. In conclusion, it may be remarked that the climate along this portion of the Klamath is extremely favorable for hydraulic operations. Though so far north, the winters there are mild, the locality being not very far inland, and but little elevated above sea level.

A Hand Rock Drill.

Wm. P. Stevenson, of Vallecito, Calaveras county, has invented and patented, through the Mining and Scientific Press Patent Agency, certain improvements in hand rock drills which consist in means for rapidly and forcibly striking the drill and at the same time turning it by appropriate mechanism. This is accomplished by means of arms which are drawn back by cams and forced forward by springs, these arms coming in contact forcibly with a movable head to which the drill is attached. The operating mechanism, through a cam, moves a lever in such a way as to operate a pawl which engages with a ratchet wheel upon the head which receives the drill, thereby turning it.

This device being a hand rock drill, it is adapted to be easily carried and held in proper position when at work. It is intended to be hung from the shoulders by any suitable harness or strap which will hold the end against the breast of the workman, and when being worked in convenient positions, a strap may pass from the neck to the forward end of the frame. The end being held against the breast, the drill is pressed against the rock and the cranks turned. There is one crank on each side. Came force the heater arms back against the springs in the tubes, and the springs impel them forward when relieved from the cams, so that their ends strike on the head of the rod which receives the drill, and thus drives said drill forward. At the same time, the cam wheel operates a pawl and revolves the drill. By screwing in certain screws the springs may be compressed to exert more power.

Ex-Gov. Blasdel has bought the Antelope mill situated in Dol Monte canyon about one and a half miles from Aurora. It is the intention to overhaul all the machinery and work ores from Esmeralda and Bodie districts.

It is conceded by all the miners of Park City, that Pinyon Hill, if the present suit was settled, would be the liveliest spot in Utah. They say it is full of ore from base to summit.

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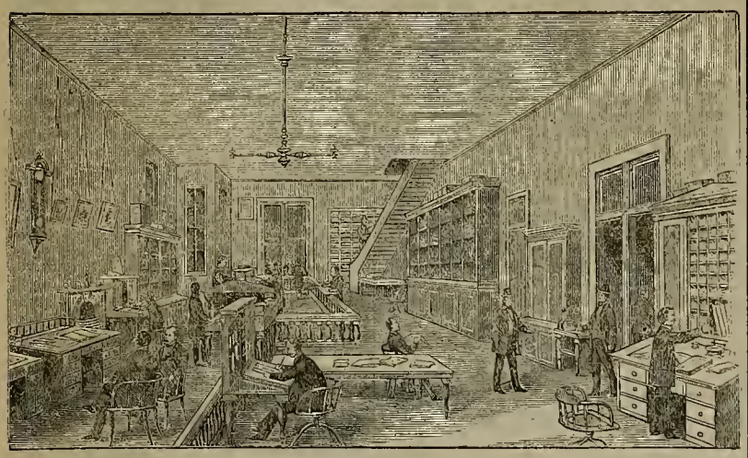

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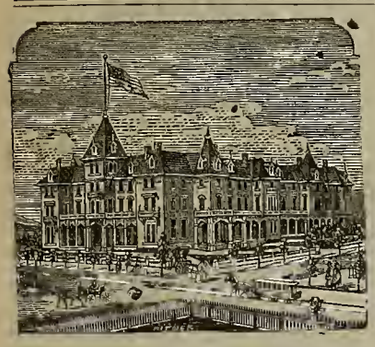

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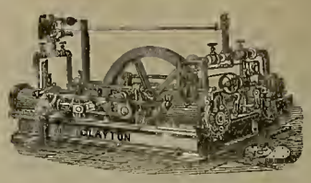

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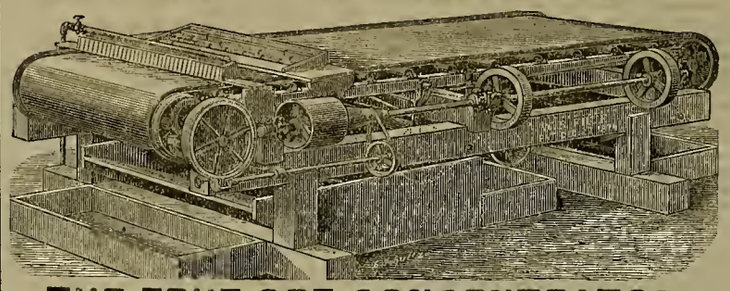

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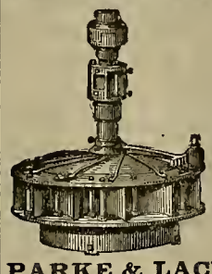

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.

FOR THE WEEK ENDING SEPTEMBER 6, 1881.

246,747.—MACHINE FOR REFRIGERATING—C. W. Oellett, Oakland, Cal.

246,674.—OVERALLS—H. Heynemann, S. F.

246,614.—COMPOUND HYDROCARBON FUEL—J. P. Jones, Gold Hill, Nev.

246,786.—GRATE FOR STOVES AND FURNACES—Thomas Kearns, S. F.

246,682.—TRICYCLE—R. Lorenzo, Summit, Cal

9,863.—OVERALLS—D. Newstadter, S. F. (Reissue)

246,825.—COFFEE POT—Geo. A. A. Oiffait, Portland, Or.

246,826.—GASOLINE STOVES—Geo. A. A. Giffait, Portland, Oregon.

246,695.—KITCHEN TABLE—C. H. Townsend, Oakland, Cal.

246,840.—WOOD BORING MACHINE—J. M. Trackwell, Skookumchuck, W. T.

246,845.—APPARATUS FOR ILLUMINATING BUILDINGS—J. B. Whitcomb, Berkeley, Cal.

FOR THE WEEK ENDING SEPTEMBER 13, 1881.

246,925.—ORE CRUSHING STAMP MILL—C. H. Baker, S. F.

246,862.—SAFETY ATTACHMENT FOR ELEVATOR—E. B. Bisbop, S. F.

247,018.—MIDLINGS PURIFIER—Wm. Crye, Walla Walla, W. T.

247,020.—COMBINED WATER COOLER AND REFRIGERATOR—Geo. W. Deitzler, S. F.

247,021.—COOLING APPARATUS FOR AIR OR LIQUIDS—Geo. W. Deitzler, S. F.

247,022.—REFRIGERATING APPARATUS—Geo. W. Deitzler, S. F.

246,872.—AERONAUTIC APPARATUS AND REGULATOR—F. DeJough, Salem, Oregon.

247,031.—DRIER FOR PAINTS—A. H. Everett, S. F.

246,948.—SEAM AND WELT FOR UNITING LEATHER—C. F. Glanville, S. F.

247,072.—MAKING PAPER PULP FROM WOOD—R. B. Lane, Stockton, Cal.

247,080.—BOILER FURNACE—John Mailer, S. F.

246,917.—DEVICE FOR SHARPENING PLOW SHARES—D. F. Spangler, Dayton, W. T.

246,918.—TOE-CALK VISE—D. F. Spangler, Dayton, W. T.

246,919.—APPARATUS FOR PULLING TIRES FROM WHEELS—D. F. Spangler, Dayton, W. W.

246,983.—HAND ROCK DRILL—W. P. Stevenson, Vallecito, Cal.

246,990.—STEAM GENERATOR—J. S. Woolsey, Gilroy, Cal.

246,934.—TOOTH BRUSH AND CASE—Arment & Scott, Dayton, W. T.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

MAKING PAPER PULP FROM WOOD.—Rufus B. Lane, Stockton. No. 247,072. Dated Sept. 13, 1881. This invention relates to certain improvements for pulping the fiber of wood to be employed as in paper stock, or for other purposes; and it is an improvement on an apparatus previously patented by the same inventor. The present invention consists of a mechanism by which the blocks of wood to be pulped are moved backward and forward across the cutting pins, and at, or nearly at, right angles with the line of action of the cutters.

STEAM GENERATOR.—John S. Woolsey, Gilroy. Dated Sept. 13th, 1881. No. 246,990. This is an improvement in steam generators, consisting in the combination of a central pipe generator with a furnace having a contracted central grate space. By the peculiar construction, but little fuel is used, on account of the perfect combustion, and by concentrating it directly over the strong draft, the inventor obtains an intense heat upon a series of small radiating water tubes set very close together.

DRIER FOR PAINTS.—Alexander H. Everett, S. F. No. 247,031. Dated Sept. 13. This invention relates to an improved drier, to be used for paints and oils. The substance used is claimed to be far superior to other driers heretofore in use.

ORE MILL.—Charles H. Baker, S. F. No. 246,938. Dated Sept. 13, 1881. This relates to certain improvements in stamp mills by which the mill is condensed in size. This will be more fully described in another issue.

HAND ROCK DRILLS.—Wm. P. Stevenson, Vallecito. No. 246,983. Dated Sept. 13 1881. This invention is described in detail in another column of this issue of the PRESS.

A FLOURISHING mining camp will some day be located in the vicinity of the Limitar or Ladrone mountains, New Mexico. Both of these ranges, which are situated a little north of Socorro, are known to contain great quantities of low grade ore; but prospectors and miners have done but little there because ore of a higher grade could be had elsewhere. However, when locations of this kind become scarce throughout the Territory, more attention will be paid to low grade districts, which are numerous, and will eventually be found to be as valuable as those which show higher assays. Low grade ore, in abundance, is sufficient to make any camp, and of this these two ranges are known to contain a practically inexhaustible supply.

The Burial of the President.

Proclamation by the Governor.

STATE OF CALIFORNIA—EXECUTIVE DEPARTMENT: The Nation is in great sorrow. For weeks it has watched by the bedside of its dying Chief Magistrate with a unanimity and tenderness unexampled in the history of the world. But its sympathies, devotion and prayers have been unavailing. It has pleased Almighty God to remove James A. Garfield, the President of the Nation, a great and good man. One of the noblest representatives of Republican institutions has fallen. But in a Republic, the Nation survives when great men fall. The Government continues when the President dies. Our dependence is not on any one person, however great or good, but on the intelligent virtue and patriotism of the people and the blessings of God.

I, therefore, George C. Perkins, Governor of the State of California, recognizing the common sentiment of dependence on the Supreme Ruler of the universe, which has characterized the country during all this long agony of watching and waiting, do hereby appoint the day that shall be designated for the obsequies to be a day of humiliation and prayer, and I recommend all citizens of the State to suspend their usual business on that day and assemble in their respective places of worship, that they may humble themselves before Almighty God and supplicate His blessings upon the nation that this visitation may not be the beginning of a series of national calamities; that it may be overruled for good to the country; that in this hour of our great sorrow we may not forget the anguish of the bereaved wife, stricken children, and aged mother; that the new President and all the associate officers may be prepared to meet the exigencies in the changed conditions, and that the whole people, by a fresh consecration of themselves to the hands of righteousness and patriotism, may so live that the nation will have honor. God reigns, and with His blessing a true republic can never die.

In testimony whereof I have hereunto set my hand and caused the great seal of the State to be affixed at the City of Sacramento, this 20th day of September, 1880.

GEO. C. PERKINS, Governor.

Attest: D. M. BURNS, Secretary of State.

SKILLFUL SURVEYING WORK.—The contract for sinking the Maryland three compartment incline shaft on the eastern extension of the Idaho quartz mine, Grass Valley, was let to Edward William Parr, and was commenced on the 12th day of June last. In less than 10 weeks from that time they had completed their work in a very true, substantial and workmanlike manner. The incline is 125 ft., and the angle is 68°. This shaft strikes the drift at the distance of nearly 1,000 ft. from the tunnel entrance. The tunnel was run from near the foot of the mountains, a distance of 700 ft., and struck the Idaho ore vein, and then a drift easterly for 300 ft. along its course. At this point an upraise was started, but subsequently abandoned on account of water flow and the slippery and treacherous character of the ground. Mr. Bethell then made the necessary surveys to locate and start the shaft from the surface. The tunnel and drift were found to be tortuous and crooked, there not being less than 20 angles along its course, yet with such precision were these angles taken and measurements made, and with such care and accuracy were they carried for nearly 1,000 ft. over an abrupt, brush-covered mountain, that together with the exact elevations and calculations made, the slope of the foot wall was struck at a depth of 70 ft. precisely; and the shaft terminated at the end of the drift below without an inch of difference. Such very correct surveying is seldom performed, or indeed heard of. It is the intention of the directors to continue the sinking of the shaft, and very high expectations are being had as to the ultimate value of the mine.—*Grass Valley Union.*

AT REST.—Elijah Dewey Waters, Sr., died at Stockton on the 4th inst., of Bright's disease of the kidneys. Mr. Waters came to California from Bennington, Vt., in 1853, and his was one of those families well-known in moral and religious circles in those early times. While in the East he was engaged in commercial business, and was at one time here, for several years, connected with the *Mercantile Gazetteer.* His sons, Dewey and Frederick, learned the printing trade, at which the latter is still employed. Mr. Waters always devoted his efforts to the best interests of society in his newspaper connections. His liking for agriculture lasted him through life, and he enjoyed greatly a few of his latest years on the ranch of his son, near Stockton. We believe he was at one time the most elderly member and attendant of the Stockton Grange. His life was kindly, unobtrusive and useful.

News in Brief.

RAIN storms prevail at Portland, Or.

FROSTS prevail in the vicinity of St. Louis.

THE coal miners at Nanaimo, B. C., have struck.

ANOTHER brick block is going up in Gridley.

A NEW $20,000 sawmill is to be built at Seattle, W. T.

THE losses by the fire at Austin, Nevada, foot up about $50,000.

THE Petaluma Woolen Mills are turning out 700 yards of cloth daily.

RUSSIAN river, at Guerneville, has been stocked with black bass.

THE new Welland canal is open, and vessels are being towed through.

THE pay roll of the Virginia & Truckee railroad for August amounts to $35,000.

THE fire on Mt. Tamalpais, Marin county, is still raging, but with diminished force.

THE passenger time between St. Louis and New York is to be reduced to 28 hours.

A SPECIAL Court-martial is to be ordered to try Mason, who attempted to kill Gnittean.

LABOR is unattainable at Victoria, B. C., and there is an increasing demand for real estate.

THE fastest four-year-old stallion time on record was made at Oakland by Romero—2:22¼.

IT is expected that the Mexican Central railroad will reach Chihuahua in six months.

LAST week 7,340 immigrants arrived in New York.

HORACE HAWES, of San Francisco, ran 220 yards, Thursday, in 21 3-5 seconds—the fastest time on record.

ALBERT HART, Private Secretary of Gov. Perkins, was painfully injured by a fall at San Jose, Thursday.

THE estimated cost of the narrow gauge railroad which is now being talked of in Los Angeles, is from $5,000 to $6,000 per mile.

FOR the last two or three days extensive brush fires have been burning over the mountains some 30 or 40 miles east of San Diego.

WHEN the question of State division was up before, says the Visalia *Delta*, it received 16 supporters in this county. Out of this number several have since died.

ON the line of the Atlantic and Pacific railroad between Albuquerque, N. M., and the end of the grading operations in Arizona, about 350 miles there are 240 saloons.

MUCH anxiety is manifested, says the Anaheim *Gazette*, by the orchardists in the southern and western parts of the city on account of their trees putting out full blossoms out of season.

A ROLLING mill is to be established by a number of Oakland capitalists, at West Oakland. Prominent among the promoters of the same are F. K. Shattuck, A. Chahot, and A. J. Snyder.

THE grading on the Oregon and Nevada railroad has been completed 20 miles from Reno. Ten miles of rails have been laid, and as soon as the iron arrives a mile of track will be laid daily.

IT is said that France has proposed and England has accepted, a proposal that an Anglo-French military commission he appointed to re-organize the Egyptian army, so as to prevent any future revolts.

LIONEL SACKVILLE WEST, successor to Sir Edward Thornton as British Minister to the United States, will sail from Liverpool for Philadelphia on the American steamer *Pennsylvania* on October the 15th.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

O. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—San Mateo and Santa Clara counties.
C. E. WETMORE—Alameda county.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct, or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto valled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

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San Francisco Metal Market.

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WEDNESDAY, September 21, 1881.

IRON.—			
American, Pig, soft, ton	—	@	30 00
Scotch, Pig, ton	—	@	25 00
American White Pig, ton	—	@	—
Oregon Pig, ton	—	@	26 00
Clipper Gap, White	—	@	26 00
Clipper Gap Car Wheel	—	@	35 00
Refined Bar	4½	@	6
Horse Shoes, keg	7 00	@	8 00
Nail Rod	—	@	9½
Norway, according to thickness	8½	@	9½
STEEL.—			
English Cast, lb	16	@	18
Black Diamond, ordinary sizes	13	@	15
Drill	15	@	16
Flat Bar	—	@	16
Plow Steel	15	@	16
COPPER.—			
Ingot	—	@	52
Sheet	—	@	20
Sheating, Timed 14x18	—	@	42
Nails	—	@	—
Bolts	38	@	42
Old	—	@	18
Bar	—	@	22
Cement, 100 fine	—	@	15½
LEAD.—			
Pig	—	@	4½
Bar	—	@	6
Pipe	—	@	8
Sheet	—	@	9
Shot, discount 10% on 500 Bags			
Drop, per bag	—	@	2 10
Buck, "	—	@	2 30
Chilled "	—	@	2 50
TIN PLATES.—			
10x14 I C Charcoal	—	@	7 50
10x14 I C Coke	6 00	@	6 25
Banca Tin	—	@	25 00
Australian	—	@	22 00
I. C. Charcoal Roofing 14x20	—	@	7 25
" " " 20x28	20 00	@	21 00
ZINC.—			
By the Cask	—	@	9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	—	@	10
NAILS:—			
Assorted Sizes	3 50	@	3 75

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Consolidated Virginia Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Virginia Mining District, Storey County, State of Nevada.

Notice is hereby given that, at a meeting of the Board of Trustees, held on the twenty-second (22d) day of August, 1881, an assessment, (No. 16) of Thirty (30) Cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, 309 Montgomery street, Room 26 (Nevada Block), San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-fourth (24th) day of September, 1881, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on Saturday, the twenty-second (22d) day of October, 1881, at the hour of eleven (11) o'clock A. M., at the office of the Company, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

A. W. HAVENS, Sec'y.

OFFICE—Room 26, No. 309 Montgomery street (Nevada Block), San Francisco, Cal.

The Oxford Beta Tunnel and Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Aurora, Esmeralda County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the Twentieth (20) day of August, 1881, an assessment, No. Twenty-nine (29), of Twenty (20) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Rooms of Dr. Knowles, 118 Dupont street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the Twenty-sixth (26) day of September, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the Seventeenth day of October, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. H. PECK, Sec'y.

Office—Rooms of Dr Knowles, 118 Dupont street, San Francisco, Cal

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PATENTS obtained promptly; Caveats filed expeditiously; Patent Reissues taken out Assignments made and recorded in legal form; Copies of Patents and Assignments procured; Examinations of Patents made here and at Washington; Examinations made of Assignments recorded in Washington; Examinations ordered and reported by Telegraph; Rejected cases taken up and Patents obtained; Interferences Prosecuted; Opinions rendered regarding the validity of Patents and Assignments; Every legitimate branch of Patent Agency Business promptly and thoroughly conducted.

Our intimate knowledge of the various inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons; and our success and business are constantly increasing.

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In addition to American Patents, we secure, with the assistance of co-operative agents, claims in all foreign countries which grant Patents, including Great Britain, France, Belgium, Prussia, Austria, Baden, Peru, Russia, Spain, British India, Saxony, British Columbia, Canada, Norway, Sweden, Mexico, Victoria, Brazil, Bavaria, Holland, Denmark, Italy, Portugal, Cuba, Roman States, Wurtemburg, New Zealand, New South Wales, Queensland, Tasmania, Brazil, New Granada, Chile, Argentine Republic, AND EVERY COUNTRY IN THE WORLD where Patents are obtainable.

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We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency.

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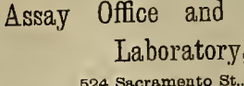

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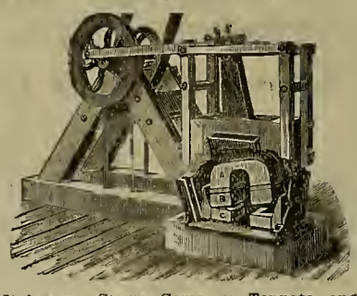

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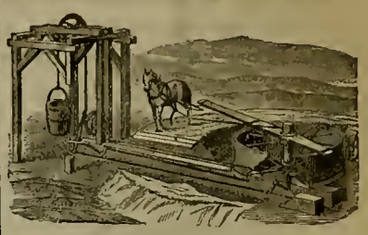

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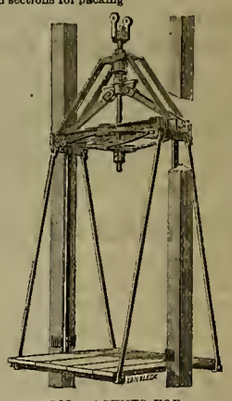

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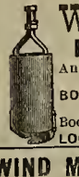

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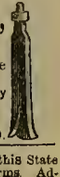

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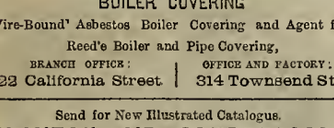

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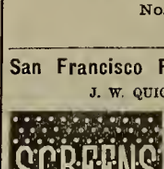

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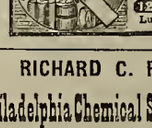

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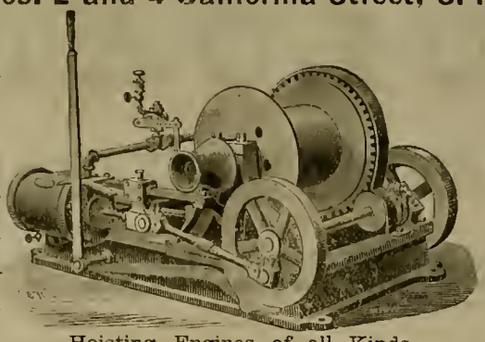

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BOTH PROCESSES ARE PERFORMED AT ONE OPERATION.

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An endless chain carrying conveyors or scrapers passes continuously through over both hearths, going one way through one chamber and the other through the other chamber. By this means the ore is fed and discharged at the same end of the furnace.

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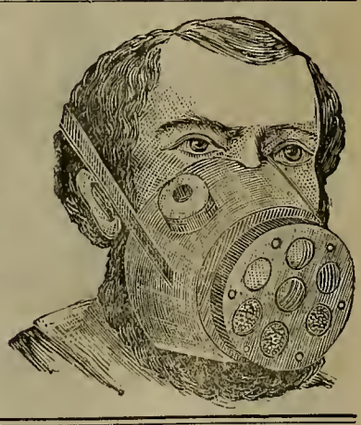

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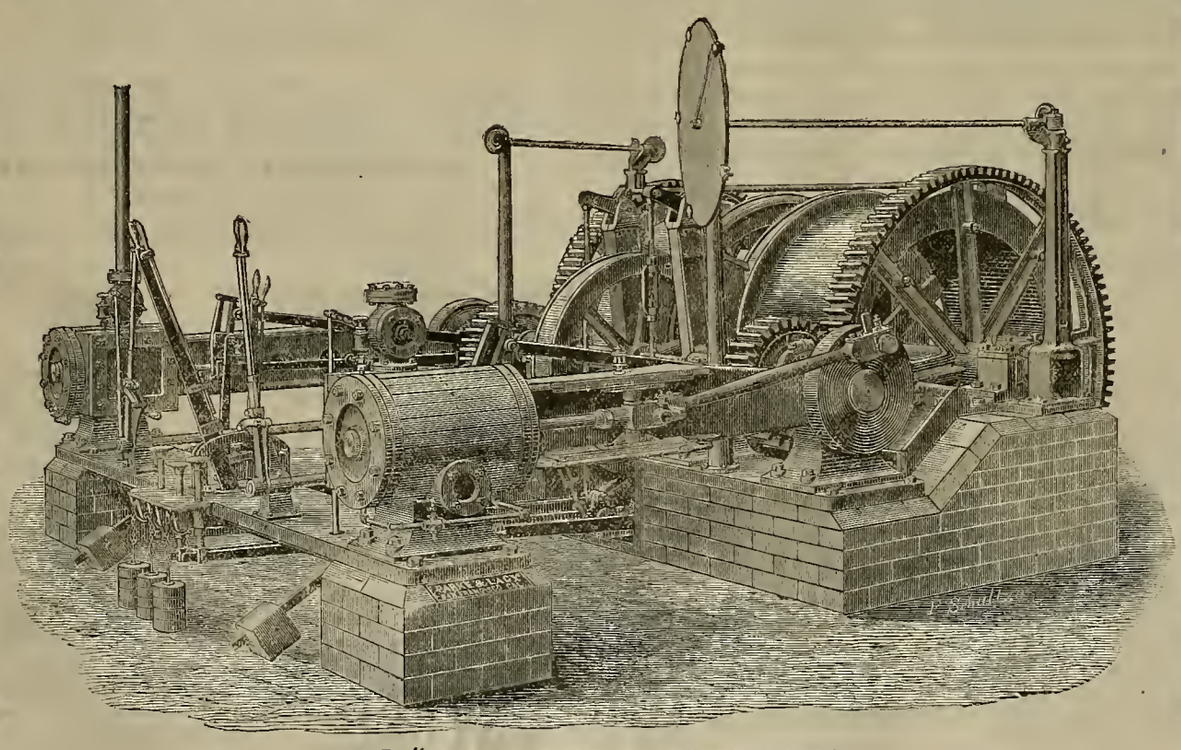

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, OCTOBER 1, 1881.

VOLUME XLIII Number 14

New Vertical Mining Wheel.

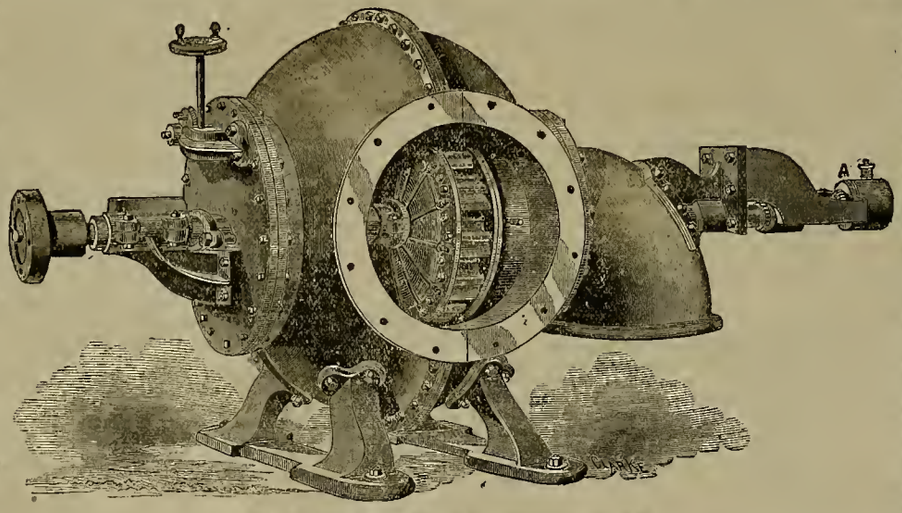
We illustrate on this page a method comparatively new in the application of turbines to mining purposes. The engraving gives a view of the new design and patented casing made by James Leffel (Parke & Lacy, 21 Fremont street, agents) intended to be a more convenient modification of the patent globe case.

The object attained in this new arrangement is economy of space and the application of an extremely small inlet and headpipe; this latter being accomplished by a peculiar and patented arrangement in the upper or interior part of the casing. The design effects also a great saving of power, by means of the use of anti-friction bearings which can be oiled, the whole being accessible and subject at any time to examination. The design is intended particularly for mining purposes, and for small wheels under high heads, where the use of gears is not only difficult of arrangement and of keeping in order, but frequently impracticable otherwise.

The horizontal shaft of the water wheel, on which is placed a pulley, affords the most efficient means of connecting the power to the point where it is desired to be used. This is easily effected, and any amount of power transmitted and motion obtained that may be desired, by properly proportioned pulleys with light but sufficient belting. The method, however, is not only applicable to mining purposes, but frequently may be attached to saw-mills and other machinery where a simple and efficient arrangement is desired.

At present they are making the wheels on this method for the sizes up to our 23-inch inclusive, and possibly may adopt the same plan for still larger sizes where the peculiarity of the situation will render the application of this method most practical. Of course, in the wheel proper is retained the essential principles of the improved James Leffel double turbine wheel.

This arrangement is excellent for mining pumping and other purposes, and where it is desired to have the greatest power in the least possible space, having the smallest conducting pipe that can be used and the simplest communication of the power to the work.



LEFFEL'S NEW VERTICAL MINING WHEEL.

A NEW MINING DISTRICT.—C. W. Gilbert who has been engaged in mining for some years near the Churchill county (Nev.) line, informs the Winnemucca *Silver State* that a new mining district discovered by Wallace Goodell, and named Bernice, promises to be one of the best south of the railroad. The principal ledge, located and now being developed by Mr. Goodell, is 8 or 10 ft. wide and carries at least 7 ft. of free milling ore, that assays from $50 to $250 per ton. There are only a few prospectors in the district, which is between 90 and 100 miles south of Winnemucca. They are not yet prepared to accommodate visitors, so if anybody contemplates a trip there he must go prepared with provisions and blankets. Now that there is no doubt of the richness and extent of the mines, the prospectors are making arrangements to build houses and lay in supplies for the winter.

TIME must be allowed for changes in all things and business. In mining this is particularly the case. Delving through walls of solid rock is about as slow work as can be imagined, under even the most favorable circumstances. When floods of water pour in and beat stifles, one wonders that anything worthy of the name of progress is seen.

PAIRED OFF.—Senator Fair has paired off with Senator Platt, of Connecticut, therefore it will not be necessary for him to leave the Comstock at present.

Tombstone District, Arizona.

Cochise county, Arizona, occupies the southeast corner of the Territory and is rectangular in shape. In dimensions, is about 60 x 75 miles. This county was created by act of the Territorial legislature in February, 1881, being carved out of the east end of Pima county. The entire part of this portion of Arizona was occupied by a roaming, rapacious, murderous band of Apaches, until into the year 1877. For many of the last years previous to that date their leader was the notable, cruel unrelenting, barbarous, but able chieftain Cochise. Under the military administration in the Territory, of Gen. Cook, this corner of Arizona was then for the first time opened up for the possible occupation of the whites. In that year—77—a single adventurous miner—Mr. Edward Schieffelior—discovered the silver-bearing leads in the Tombstone hills. As he started out upon his hazardous trip of discovery, his friends warned him that he would find his *tombstone* rather than mines. Hence the grim humor that suggested to him the name that he gave to the first mining location he made, and subsequently to the mining district. Early in '78 this pioneer prospector returned with a small band of friends to the new field which was so soon after to yield him his fortune, when was struck the first blow with a pick, with reference to development. Favorable reports of the discoveries soon brought other prospectors to the locality. Before the close of '79 two steam hoisting works were erected and in operation respectively, the Tough Nut and Contention mines. Also, in June of that year went into operation the first quartz mill of the camp—10 stamps, since increased to 15—erected on the San Pedro river, 10 miles distant, by the Tombstone M. & M. Co., to treat the ores of the Tough Nut and Good Enough mines.

In the year 1880, eight steam hoisting works were erected on seven different mining properties and four additional stamp mills, all in the valley of San Pedro. At this time (September, 1881), there are in all 14 steam hoisting works, six horse-power hoisters and seven stamp mills, with a total of 125 stamps, distributed as follows:

Grand Central	30
Western (Contention mine)	25
Head Center	10
Boston and Arizona, S. & R. (custom)	20
Hopkins (custom)	5
Tombstone ("Gird mill")	15
Tombstone ("Corbin")	20
	125

The full results of these mills in bullion production for the month of August is not yet fully made known, but, approximately, is as follows:

Western	$ 99,000
Grand Central	95,000
Head Center	25,232
Boston and Arizona	89,604
Tombstone	125,000
Total for August	$433,836
Total for July was	432,832
Total for June was	496,906

The output of bullion for the last two months (August and July) would have exceeded over a half million each but for excessive rains, which impaired the roads and interfered with the hauling of ores.

Miners to be Held for Damages.

The Board of Supervisors of Sacramento county a short time since made official inquiry of Henry L. Buckley, the District Attorney "concerning the right of the county of Sacramento to commence action against the hydraulic mining companies who use the beds of the American and Cosumnes rivers as a place for the deposits and wastage of the debris of their mines." To this inquiry the District Attorney has replied as follows:

First—That if such deposits have already caused damage to any of the immovable property of the country, the company committing such damage is responsible to the county for such loss, and may be sued by it therefor.

Second—If such damage is continuous, that is, recurring in its nature, and is of such a character as to render any of the immovable property of the country useless for the purposes for which it was intended, or in any material degree less fit therefor, the county is not bound to wait until the property is further injured or destroyed, but may bring an action for an injunction, and thereby prevent the anticipated injury or damage.

Third—The duty devolved upon you touching the management, care and preservation of the county property implies your right of taking all legal measures necessary to accomplish that end, by suit or otherwise. The immovable property entitled to protection at the instance of the county from the avalanche of mud and sand, and in which she has a direct interest in having preserved, are the public grounds and buildings belonging to the county, her bridges, roads and highways.

Fourth—I agree that the damage to county property and interests under the protection from the continuance of hydraulic mining on the rivers named is too grievous to be longer borne, and that all the hydraulic mines tailing into the American and Cosumnes rivers should be enjoined before the commencement of the rainy season. To that end I am willing to co-operate with you in any desired manner.

The Day Mining Company.

The annual meeting of the Day mining company, was held last week. President Henry A. Fox, submitted a report, from which we extract the following: Since our last election I have to congratulate you on the development of a fine body of ore in our mine, which has every appearance of being of a permanent character. The administration has considered it advisable to purchase the Hillside property, consisting of the Hillside and Mendha mines (the latter necessary for obtaining lead flux for smelting), the smelting furnace, separating furnace, assay office and other buildings belonging to the Hillside property, and also the Fairview springs, and 250 acres of land surrounding same for the price of $30,000, $18,000 of which has been paid on account, and for the balance two separate notes of the company for $6,000 each have been given, one payable on the 25th of October, and the other 25th of December next. The acquisition of the Fairview springs is considered as most important and valuable, as it gives control of the only available supply of water in the district, and is at a sufficient elevation to allow pipes to be laid from it to the month of the Day tunnel. By removing the furnace there the cost of hauling the ore, $3 per ton, will be saved, and also the expense of hauling water to the mine, now averaging $500 per month.

From the Superintendent's (A. S. Gould) report, we take the following:

Have extracted and hauled to furnace 1,154½ tons of ore, of which 387 tons remain on furnace dump.

The Mendha mine property, which is at Highland, eight miles from the Day, has only come to the control of the company quite recently. We are now principally engaged in resystematizing the workings in order to facilitate and cheapen the extraction of ore as it is developed. Owing to the strange and continued disability among the men, by some supposed to be lead-sickness, I could not bring the mine at once to what I believed is its assured productiveness. At last the health of the camp is improving, and henceforth we shall not likely have any more trouble on this account.

We fired up the Day furnace (Bristol) for the first time on the 11th of July last, and on the 15th began the production of bullion. We were obliged to stop for repairs quite frequently, but nevertheless the yield to date, as appears by the clerk's books, is 2,065 bars, weighing 205,389 lbs.; total value, $36,710.74. Of this we have shipped to San Francisco 447 bars, weighing 44,712 lbs.; on hand, 1,618 bars, weighing 106,677 lbs. We also have 8½ tons fine bullion not yet sampled. A second boiler has been placed in position, and the old one is being repaired, so that in case of the failure of one, we can use the other, and not be obliged to shut down for want of steam. We have consumed 41,386 bushels of charcoal and find on hand 17,656 bushels. The receipts and expenditures amounted to $128,170, $45,000 of the receipts being from assessments, and $2,917 from bullion product. The election for Directors resulted as follows: A. K. Grim, Thos. Cole (Vice President), H. A. Fox, J. L. Brown (President), C. W. Beaver. E. M. Hall was elected Secretary.

THE recent discovery of a rich silver mine 10 miles from Deadwood was followed in 48 hours by the creation of West Virginia City, the election of a recorder, the settlement of 1,000 persons, and the opening of nine saloons and two faro banks. On the fourth day a daily newspaper appeared, and now a stranger entering the town would suppose it was established at least five years ago.

THE owners of the Ontario, Utah's great mine, are about starting a tunnel to run 6,000 ft., or a little over a mile, for the purpose of helping to drain the mine.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Mining Projects in London.

Editors Press:—It may interest your readers to know the fate of the many new mining companies in London during the present year. From January 1st to August 1st there were 390 projects of all kinds. After deducting English and foreign railways, corporations and colonial loans, foreign loans, railway mortgages and preference stocks, debentures and tramway (street car) companies there remained 273 of what might be called "speculative" projects. Of this number about 20% were floated, the remainder fell through. Of the 273 projects 55 were gold and silver mining companies. The fate of these projects is shown in the following list. It will be observed that but a small proportion were floated, and a still smaller proportion admitted to a "settlement," that is, approved by the London Stock Exchange and permitted to be quoted on their official list as properly constituted and capitalized companies under the Limited Liabilities Acts of 1862 to 1880.

Name of Company.	Remarks.
Akankoo (Gold Coast) Mining.....£1	½ dis
Alpha Skull and Cavern Gold Reefs.....	
Asia Minor Mine.....	
Australian Company.....	
British Australian Gold.....	
California Gold, Colorado.£1	½ prem., price nominal.
Carta Para Gold.....	No price.
Central Wynaad Gold.....	⅜ dis.
Cherambadi District Gold...	
Chile Gold.....	½ dis.
Cootacovil Gold.....	
Dieu Donne Gold.....	
Dingley Dell Estates and Gold.....	
East Herodsfoot Silver-Lead £1	
Eureka (Nevada) Silver.....	No price.
Flagstaff District Silver.....	
Gold Hill.....£1	½ prem., price nominal
Gold Mining Association of Canada.....	
Gold Mining Trust.....	
Great Southern Mysore Gold £1	⅜ dis., price nominal.
Great Zaruma Gold Mining..	½ prem.
Guayana Gold.....	Not floated.
Havcu Gold.....	Title disputed.
Hoover Hill Gold Mining N. C.....£1	Officially quoted ½ prem. (subscribed 10 times over.)
Indian Consolidated Gold.£1	Nominally at par.
Indian, Kingston and Sandhurst Gold.....	
Indian Trevelyan Gold.....	Officially quoted ½ prem.
Keystone Gold.....	
Klondra Gold Mining.....	
La Conception Gold Mining.	No price.
Madras Gold.....	½ dis.
Mont Dore of Bournemouth	
Moscile Mines.....	
Needlerock Estate and Gold.	
New Callao Gold.....	No price. Subscriptions limited.
Newfoundland Consolidated Copper and Gold.....	Not floated.
Nilgiri Gold and Cinchona..	
Nine Reefs Gold.....	Satisfactorily subscribed, we understand.
North Ooregum Gold.....	
North State, N. C., Gold, Iron and Railway.....	Withdrawn.
Olathe Silver.....	No price.
Organos Gold Mines.....	No dealings.
Parcherry Indian Gold...£1	
Pierre d'Or Gold.....	
Providence Gold Mines, Grass Valley, Cal.....	Not floated.
Quartz Hill Con. Gold.....	
Rara Fortuna Silver Mining.	
Red Mountain (Colorado) Silver.....	
Silver Valley.....	Winding up.
Simon's Reef Consols Gold..	
Sosa-y-Mendez Gold.....	Partly subscribed.
Victorine Gold (Bonds).....	
Wentworth Gold and Indian Estates.....	½ dis.
Wynaad District Gold.....	⅜ dis.
Wynaad Glen Gold.....	

From this exhibit and the experience I have gained during five months' residence here, every day of which has been devoted to the capitalization of Pacific coast mines, I draw the following conclusions:

1. Prospects and abandoned mines will not sell at any price. People here want "going concerns" with a near prospect of permanent dividends.

2. Overvalued mines will not float.

3. To put a mine successfully on the London market it must not only be such an one as above described, the vendore must be prepared to defray expenses of "promotion," or, at least part of them. This includee the expenses of agent, solicitor, printing, advertising, etc. These vary from $5,000 to $15,000, according to circumstances.

4. A complete report, attested by a mining engineer of well-known skill and good reputation here, must accompany the offer. Also prospectus, maps, samples, etc., carriage prepaid. Also reference as to character of vendors for commercial integrity, etc. Mines taken up under other circumstanoee get into the hands of "shady" people here and will surely fall through.

5. A power of attorney to the agent to sell at given price. This must be drawn according to the English formula and before a notary, whose signature is attested by the nearest British Consul.

The market for first class Pacific coast properties is improving every day. I have succeeded in obtaining considerable capital already, and expect to obtain more. I shall leave for San Francisco about the 1st of October.

Alex Del Mar.

Del Mar's London Agency, 24 A Southwark St., S. E. London, Sept. 7, 1881.

Sights and Sounds on the Columbia.

Editors Press:—From the time one crosses the bar of the Columbia river, a continuous but varied panorama of beauty and grandeur greets the eyes until the arrival at The Dalles. For a person desiring a fortnight's recreation out of the beaten track of the professional tourist, I know of no other trip which en etrongly appeals to him of a moderate purse and an eye for the beautiful; especially if he be able to withstand the tendency to the *mal de mer*, and is sufficient of a sailor to retain a good appetite and get his money's worth out of the larder of the corporation which carries him over. It was six o'clock in the morning, and the waves were dancing and glittering in the sunlight, when the old steamship *George W. Elder* after a stormy passage of nearly 70 hours from San Francisco rested outside of the

Columbia River Bar

For an hour, awaiting the most favorable condition of the tide, to cross the sand reefs which obstruct the mouth of that mightiest stream of the Pacific slope. All admire the bright surroundings and the picturesque promontory on which is located Fort Canby, whose site is clad in refreshing green of pines and grasses. Yes, even the government soldiers, who have made the trip up in the steerage, detailed, machine-like, to the fort, seem to regard the change from wave to picket as "a consummation to be devoutly wished for." The hay is dotted with countless white and gleaming little sails—fishing smacks from the salmon canneries along the river, pulling in or resetting their nets, and examining their morning catch. It is this industry, mainly, which keeps alive the little

City of Astoria,

Which now loome in sight. The signification of the pretty name becomee apparent when we are told that John Jacob Astor established a trading-post here many years ago, even before American sailors had taken up the cry, "Fifty-four, forty or fight." "Boom!" goes the signal gun, and we glide up to what looks like a town on stilts. All the business portion of Astoria is built out over the water, and its main street is nothing but a long wharf. But back of this, on the steep hillside, among the pine trees stumps, are numerous pretty cottages, with an occasional pretentious residence, a church or school. Although still a mammoth industry, the salmon fisheries and canneries have not done such a rushing business for the past year or two as formerly, owing to a decline in the yield of salmon.

Your correspondent was shown through the cannery of Hume & Co., which is perhaps as large as any of those on this part of the river. All told, there are no less than 23 canneries within a radius of 10 miles. The canneries generally fit up their own fishing yachts or smacks with nets and all the requisite paraphernalia, at an expense of about $500 for each boat. These are then each let out to one fisherman, who hires his own assistant and receives 50 cents for each salmon, large or small, laid down in good condition on the company's wharf. The size of the meshes of the net, however, preclude the catching of any that are not of fair size—a plan whose merits are obvious, discriminating not only in the interests of the company, but preventing the extermination of the tribe by allowing the smaller ones to grow.

It was a novel and almost imposing sight to see piled up on the dock a heap of beautiful salmon, numbering, we were told, about 1,000 fish, weighing from 15 to 35 lbs. each. An average catch for one smack during the four months' season, I am told, is about 3,000 fish. It is not, perhaps, necessary to detail to the readers of the Press an operation with which most of them, either from reading or observation, are doubtless familiar. Suffice it to say, that from the time the salmon are cleaned, sliced up into chunks that are crowded into pound cans, soldered up, boiled, and the cans varnished and labeled, until they are tested and boxed up ready for market, is a process wherein they pass through scores of hands and numerous machines, consuming several hours' time. Upwards of 200 hands are employed, those in the cannery being mostly Chinese. Everywhere is visible neatness, economy and dispatch. During the time outside of salmon season, fish and several other canneries employ their time in canning beef and various meats, and their goods are shipped by the thousands of cases to all parts of the world. Although the observer may be traveling to see the beauties of nature, if his mind is of an inquiring or utilitarian turn, these things touch a responsive chord. While most plentiful near the mouth of the river, the traveler finds canneries occasionally as far up as The Dalles.

By noon the whistle pipes all hands aboard, and we are

Off for Portland.

Plowing a wide furrow up the broad river. There is an old idea, that if you desire one to appreciate the joys and delights of heaven, give him first a good strong whiff of the sulphur and brimstone of what the Revised calls "Hades." Doubtless there is philosophy in this, and it may have been the law of contrasts that helped to raise the enthusiasm of so many to such an ardent glow on that memorable afternoon and evening. The panorama unrolle, and we see here a stretch of woodland, there a rocky bluff; now a glimpse of a busy saw-mill, then a graceful little river steamer shoots by; and then we pass an island, luxuriant in its vegetation. Just before sunset Mt. St. Helens appears, followed by more distant glimpses of those kingly peaks, Adams, Rainier, and finally Mt. Hood, whose fair and graceful form piercing the skies, almost precludes the use of the masculine adjective, "kingly." These lofty peake so tower above their neighboring surroundings, that the Cascade range seeme but a great plateau, on which they rest like monarchs seated upon a mighty raised throne. They are not merely snow-capped—they are covered clear down to their waists in the fleecy envelope.

If the traveler finds the Columbia below the Willamette full of placid, quiet beauty, he will be agreeably enprised in proceeding up the river,

Through the Cascade Mountains,

To find the scenery infinitely grander, more beautiful, rugged and peculiar than he had anticipated. None of the celebrated rivers of the East combine all the distinctive types and features of the Columbia. We have here and there suggestions of the Hudson, now a glimpse of lagoon and hanging vine, which reminds one of Southern rivers, and then a ruggedness resembling the upper Mississippi and almost pertaining to the grand canyons of the Colorado; but through and above it all runs a distinctiveness of tone and feature which makes it the one Columbia—novel and original among rivers. One almost begrudges the time spent at breakfast after leaving Portland and before reaching the pretty military post of Vancouver, for fear he may lose sight of something en route that should be seen. Although the boats are well furnished and administer well the creature comforts, it is no temptation to remain in the cabin. The distance between Portland and The Dalles comprises a region which appeals most forcibly to those having a smattering of geology. Through four-fifths of the journey the river makes its way through the Cascade range of mountains, many of whose peaks are snow-clad, and some of them attaining an altitude of over 1,200 ft. Scientists differ as to the causes of this huge thoroughfare, cut through the solid rock. Some attribute it to glacial action, and back up their theories with arrays of data and figures, showing to their own satisfaction at least, that mighty rivers of ice first plowed their way with irresistible force through the everlasting hills to the Pacific. Others attribute it to volcanic, and point to the great peaks, Hood, Adams, Jefferson, Baker, St. Helens, Rainier, and others, standing almost to their waists in their own lava—the cooled flood which they have in past times belched out. According to these latter theorists, the lava contracted so in cooling as to make the mighty fissure which now forms the bed of the Columbia—not so large then as now, but worn greater by attrition and disintegration. The mighty basaltic cliffs rise perpendicularly in places, presenting a sheer wall without crack or crevice, over 300 ft. in hight. Suddenly the wall turns at an acute angle to continue for a ways its unbroken surface. Its sides are covered with mosses and lichens, giving it the appearance of a mighty and forgotten stronghold that has passed out of the world's history. Here and there the plash of a little cascade is heard as it comes over the edge of the cliff, first gliding, then ricochetting, and finally bounding, loses itself in its own rainbow-lined spray. Some of these lovely falls, which may be counted by the score, possess all the elements of beauty of the Yosemite itself.

It seems a pity that so grand a river as the Columbia should not have a clearly navigable stream throughout its length, but it is far from the case. In the 135 miles between Portland and Celilo, there are two great

Impediments to Navigation,

The cascades and the *dalles*, which have always been passed by railroad portages, since steam navigation began on the river. These necessitate much extra labor in the transfere and many handlings of freight.

Readers of the Press will please not confound the word *dalles*, as here need, with the brisk and growing municipality below, on the river's bank, called by that name. The word is often defined now as meaning rapids, but that is not comprehensive enough. The word is one of the French bits of rude eloquence by which the voyageurs of the Hudson Bay company described striking objects. Its original scope comprehended the pavement of a terrace, and did not so much apply to the current of the stream as to the banks and their immediate surroundings. Although no one word in our language is sententious enough to convey the idea in full, one writer has elaborated it into the phrase "broad flight of noble flagging," implying the grandeur of a noble terrace, and the splendor of the pavement of a palace. The whole character of the river here is changed, and what was seen a few hours ago as a majestic stream over half a mile in width, now seems like its former self turned on edge and crowded down into a crooked and angular gorge, across which a man could hurl a stone—a swift, seething and almost bottomless torrent. And all this gorge is chiseled out of rock that seems as hard and unyielding as iron. While Congress has been appropriating means for the assistance of navigation, it has concluded that money would be better spent in building a canal at the cascades, where it is but little steeper than are the St. Lawrence rapids, than here, where the laborers would have to cut, crash and rend with Giant powder, a distance of between six and nine miles. Accordingly, the government canal works at the cascades are in operation, and from present appearances are to consist of two strong walls in the river, close to the southern shore, through which the water can flow unvexed by the rocks that abound in the rapids, and which are formidable obstacles at low water. While under ordinary circumstances this might do, the planners of the work are much criticised because they did not build the canal on the Washington Territory side, where the mountains here do not terminate abruptly at the edge of the stream. It is a patent and acknowledged fact that the mountains along the cascades are rapidly disintegrating, and great beds of shale are annually sliding down. From present indications it will, although on a smaller scale, require as much vigilance to keep this canal clear from the debris which is honnd to slide into it, as it does to keep the Suez canal free from the shifting sands of the desert. The same remark applies in many places to the railroad now building between Portland and The Dalles. It looks like a dangerous location for a road, as no one is able to tell at what minute thousands of tons of loose, shaly basalt may not come sliding down on the track in an avalanche. However, time will prove whether these fears are well grounded.

W. B. Turner.

How to Buy Mines.

During the past five years the country, with the exception, perhaps, of the Pacific coast, has made wonderful progress in material prosperity, and such has been the accumulation of wealth at all the great business centers of the Eastern States that several of the more enterprising merchants and daring speculative operators have amassed colossal fortunes, while the condition of the great majority of the people has been largely ameliorated, and many have secured a comfortable competence. The effect of this vast aggregation of wealth has been to foster a speculative spirit, and such has been the eager demand for the stocks of almost all incorporated companies that the properties have gone up to figure that threaten an early and disastrous collapse for all such whose prosperity is not built on a solid foundation. Speculation is rampant, and the great gains secured by fortunate operators are a constant temptation to awaken the avarice of those who are anxious to clutch the glittering prize of wealth. In the investments of this eager throng of wealth-seekers, mining shares have held a secondary place, railroad stocks being the favorites in New York, and speculation in the rise and fall of grain tempting the cupidity of operators in the great western cities. The reason why mining ventures, though dabbled in to a considerable extent, have not proven favorite investments, is to be found in the questionable methods pursued by those unscrupulous operators who have monopolized the business of "promoting" mining properties. It seems to be impossible for an honest miner to sell his mine in the Eastern market, however good the the property may be, or however low the figure he may offer it at. A modest and comparatively obscure individual will not be listened to, even though he have the deed to an exceedingly valuable mine in his pocket. Tricky speculators, who have some high-sounding military title, or possess political or social influence, can sell a wildcat mine for ten times the amount the actual miner asks for his far more valuable property. This fact is so well known, that the prospector or miner whose mine is yet but partially developed sticks to his camp, and awaits, almost hopelessly, the influx of "capital," which by the development of other mines in the vicinity may possibly at last secure a market for his own.

If outside capitalists who wish to secure good mines at a low figure would send a trusty agent or expert into the mining fields to inspect properties and deal directly with the owners, they would avoid the payment of an enormous profit to the middle-man or promoter, who now secures the lion's share of the amount realized on sales. Such agent would find in every camp in Arizona plenty of promising prospects, owned by men who are too poor to develop them, which could be secured for a mere trifle, and many of which would open up into splendidly paying properties. The wealthy purchaser can better afford to run the risk of prospecting work than the poor locator; and as a large number of such prospects could be secured for the amount that would have to be paid for a single fairly developed property, we maintain that it would pay investors far better to take a few small risks of that kind than to pay a fancy price for a property bought from a speculator, who offers it to them under the glittering allurements of an extravagantly worded prospectus.—*Tombstone Epitaph.*

The Laramie *Boomerang* says: "It don't do to fool with Giant powder," said an old-timer yesterday in the *Boomerang* office. "It's powerful stuff. I had a $10,000 mine over in the Queen of Shelby district in '53, called the Goshallhemlock claim. I was offered $10,000 for it, with $5,000 in Sagebrush placer stock besides, if she opened up as well 10 ft. further down. We put in a blast of Giant powder, and when we went to make an examination, we could not find the Goshallhemlock with an assessor and a search warrant. The hole was there, but there wasn't quartz enough to throw at a yellow dog. My idea is to sell a mine just before you put in the Giant powder, and then if the buyer wants to blow the property into the middle of Christmas, let him do it."

Another vein of coal has been found in the Central mine, Monte Diablo.

MECHANICAL PROGRESS.

Possibilities of Cast Iron.

There is a class of cast-iron work, says the *Metal Worker*, that formerly was imported more extensively than now, which gave us minute articles of use, and even ornamental appendages to dress, so light in weight and so apparently fragile in form as to suggest fine hand labor. It was supposed that we had no material or means to reproduce such diminutive and fragile articles from cast iron. But recent improvements, both in material and manipulation, prove that we can almost equal the delicacy of what is known as "Berlin iron." Fine charcoal iron possesses wonderful properties of fluidity when in a molten state; it finds its way into the smallest interstices of the mold, and comes out cooled, a definite reproduction of the imprint of the pattern. So exact is this reproduction that bare lines, to be represented only by very fine wire, come from the mold perfect in form and quite tenacious in texture. Articles of cast iron, cast in a mold of sand, which require 50 or 100 to balance a quarter-pound weight, are as readily produced here as articles weighing pounds. It may be doubted if any metal is capable of producing more diminutive objects than iron. As instances of the possibilities of charcoal iron in castings, let anyone examine the delicate shoe-buckles and belt-buckles, the shawl-clasps and ornamental hairpins, called steel, which bear a burnished surface rivaling that of silver. He will find they are of cast iron, very brittle, and showing a bright iron fracture. Quantities of these articles are made in England. They are said to be cast in sand molds, the same as masses of iron are cast, and that come out as perfect as the heavier castings. In short, the possibilities of cast iron range from the utmost capacity of adjoining cupolas, capable of melting 30 tons, to the hand-ladle that with 10 lbs. of metal, pours for a thousand separate articles.

Small Steel Castings.

The reader will find the following of interest in immediate connection with the above: A correspondent of the *Ironmonger* recently asked for information as to how steel castings could be made by the consumers, instead of paying a long price and submitting to vexatious delays in obtaining them from Sheffield, decided me as to the advisability of completing some experiments on which I was then engaged, some of the results of which I now give, in the hope that others who know more of the subject than I do, may be willing to give me and other of your readers the benefit of a few hints. After some failures, I found the following mixture give a very good looking and sound casting: 35 lbs. Bessemer rail ends, cut small, 12 lbs. No. 1 hematite pig, 8 lbs. broken unannealed castings or runners, 1 lb. spiegel. I used green-sand molds, composed of 12 parts Mansfield sand, 1 part coal dust, 1 part charcoal. These were well vented and dusted with plumbago. Of course these proportions may be modified to suit the class of work required. I cannot say that the castings are entirely free from air-holes, but they are not worse in that respect than those we buy. I did my melting in plumbago pots from Battersea, and did not find that there was any difficulty with the carbon in the pots. The annealing I accomplished in an oven without care. I would strongly urge my brother founders who have now to purchase steel castings to make them themselves. There is no real difficulty about it, and although there may be a few mishaps at first, a little perseverance will speedily overcome all obstacles. I may add that I myself effect a considerable saving by becoming my own crucible-steel founder.

"Iron Sponge" for Gas Purification—A New Industry.

Iron sponge is a term quite unfamiliar to the average reader, although the manufacture of that article is now one of the established industries of the world.

For the benefit of the uninitiated in the manufacture of gas, we will explain the nature of the new product and its uses.

Coal gas, after being washed and condensed, remains heavily charged with impurities in the form of sulphuretted hydrogen, ammonia and carbonic acid, which must be extracted before the gas is fit for consumption, otherwise the odors emitted by the gas while burning would be unbearable.

To remove these impurities, *lime* has—until within the last three years—been universally employed, being considered the cheapest and most effective absorbent, although its use entailed many disadvantages. As it could be used but once, the rapid accumulation of "spent lime" with its accompanying odors—familiar to all persons living near gas works—necessitated hauling the same outside the city limits, in many places being an expense of no little importance.

Various experiments were made by those interested in the manufacture of gas to find an absorbent equaling lime without its disadvantages, and success was finally attained some three years ago.

Iron sponge, the term given the successful rival to lime, is obtained by treating oxides of iron in contact with carbon at a suitable heat with complete isolation from the atmosphere, and its peculiar spongy texture is caused by the loss of the volatile matter which, separating from the ore, leaves minute cells and spaces throughout its entire mass, rendering it extremely sensitive to chemical action.

After being used and becoming thoroughly saturated with impurities, it is exposed to the atmosphere for two or three days, which thoroughly revivifies it, and it is again ready for use; the same material being used over and over again for the period of from one to three years, depending upon the condition of the works, character of the coal used, etc.

The advantages claimed for iron sponge over lime are, greater economy, saving of labor, odors, etc., and it would seem not without reason, for since its introduction into the gas works of this city, it has been adopted in Philadelphia, Cincinnati, Chicago, St. Louis, Kansas City, Sacramento, and scores of other works of less importance throughout the country.—*Am. Manufacturer.*

Novel Driving Belts.

What may be termed a "revolution in belting" is predicted by the patentees and manufacturers of a novel driving belt, called the "perpetual tension belt," of spiral wire, either brass or steel, as desired. While at work the belt is continuously changing its exterior position, or, in other words, is rotating at right angles to its line of motion, while passing round the pulleys, thus wearing the surface of the coil uniformly. The ends of the belt are fastened together by screwing flexible plugs into the ends of the coil, one being formed with a hook and the other with an eye.

This belt can be used either with V-shaped grooved pulleys, or concaved toothed gears. The principal points of advantage claimed by the makers are, that it maintains a uniform tension, compensates for varying resistance and distance, utilizing a much higher degree of power expended, and obviating other difficulties heretofore experienced in transmitting power by belting. It is claimed that it never requires taking up; gives no trouble with belt hooks or lacing; runs sewing machines with one-third less labor; will outwear a great many ordinary belts; is not affected by the weather; that the wear of machinery is lessened, and that it has better adhesion to pulleys. The same device can also be applied as a sash cord, for window frames, and as a door spring to close doors. Besides running ordinary machinery, it has been used successfully on sewing machines, scroll saws, hand-blowers, steam-engine governors, lathes, etc.

Still another novel driving has recently been patented, which is described as a steel ribbon lined with leather. The patent is issued upon the novel method of connecting the metal and the leather.

Antiquity of Trade Marks.

The question has been asked somebody, "How old are trade marks?" who answers it by saying that they seem to be nearly as old as the industry of the race.

Ancient Babylon had property symbols, and the Chinese claim to have had trade marks 1,000 years before Christ. Guttenberg, the very inventor of printing, had a lawsuit about a trade mark, and he won it. As early as 1300 the English parliament authorized trade marks, and the laws of America have always protected them. The theory by which a suit is brought for infringement of a trade mark is that its use deprives the originator of his property, and deceives the public as to the article. Extraordinary means have been required at all times to guard against the fraudulent use of marks of manufacturers.

In ancient times the greatest importance was placed upon the marks of individual workmen, because, as in the case of the armorers, valuable lives often depended on the quality of the workmanship. One old author complains that certain good and true soldiers were killed simply because the workmanship of their swords and arms were not good, and failed them when in battle. Very early, therefore, it was found necessary to make stringent laws against counterfeiting trade marks, and against scamped workmanship. Without protection in this one particular, trade would almost come to a standstill, because there are very few things, comparatively, that can be purchased on their merits, judged at the moment. In general, we know the quality of goods by experience, and it is only after they have been in use that a certain judgment can be pronounced upon their quality. Having, then, once found that a certain workman's productions are good, we seek them again in the market. If we have no means of identifying his trade mark the whole work of buying becomes a haphazard affair. The best goods at once lose their value. This was early discovered, and probably the successors of Tubal Cain were the first to use distinctive marks on their manufactures.—*Carpet Trade Review.*

SCIENTIFIC DISCOVERIES THEN AND NOW.—It seems to have now become the fashion in Germany that every new discovery in the field of chemistry of artificial dyes is announced to the world by means of a patent, while formerly every discovery was first published by a communication to the Chemical Society of Berlin, or by an article in some chemical paper.

SCIENTIFIC PROGRESS.

The Study of Thunder Storms.

Studies of special phenomena have become very popular since it has been found that valuable results are often obtained in this way. Recently, a French gentleman—M. Lespisult by name—has been studying the subject of thunder storms in the Gironde, and comes to the curious conclusion that valleys are more struck by hail than hills or table land. It seems that a certain depth below the clouds is necessary for the formation or the fall of hail to occur without obstacle. Further, the direction of the valleys traversed have a marked influence on the direction of the clouds, though they only cause a momentary deflection, and the clouds, after following them a certain time, are carried on in the general direction of the vortical movement. For example, if a valley be in the axis of the zone of hail, or a little inclined to that axis, the hail clouds seem to be carried along that valley as dead leaves are carried along by the wind in a trench. If the valley be subdivided by a mountain spur into two others, the hail cloud also divides and the two secondary valleys are ravaged in their turn, at least to the extent in which they are within the zone of hail. Valleys lying across this zone have also an influence, though less marked. When the clouds pass over them they show a tendency to descend and to spread out on the two sides of the zone, so that the zone is broader over valleys than over plateaux, and the ravages are often greater. It might have been added that this was to be expected, since storms and air currents of all kinds generally follow the depressions of the earth, being guided by the hills to a very great extent.

NEW ELECTRIC PROPERTY OF SELENIUM.—Blondlot attaches to one of the poles of a capillary electrometer, by means of a platinum wire, a fragment of annealed selenium; to the other a plate of platinum. If the selenium is brought in contact with the platinum, by an insulating rod, the electrometer remains at zero; but if the selenium is rubbed against the surface of the metal the electrometer is immediately powerfully agitated. A deviation may thus easily be obtained, equivalent to that which would be produced by a cell of sulphate of copper. Neither the friction of two metals against each other, nor that of two insulators, can produce any charge. The selenium current flows through the electrometer from the unrubbed to the rubbed selenium, consequently the disengagement of electricity cannot be attributed to the heat which accompanies the friction.—*Compt. Rend.*

THE artificial production of nitric acid and nitrates by direct union of nitrogen and oxygen in the presence of watery vapor, through the agency of the electric spark, has long been known to be possible. The late improvements in electro-magnetic machines has attracted attention to this method of producing nitric acid and nitrates on a commercial scale. A Belgian journal asserts that such a process is actually in use, though with what success we are not informed. An electric-magnetic machine is made to discharge a continuous stream of sparks through a series of closed vessels, through which a current of air is passing. Red nitrous fumes are produced, which are carried with the air current to a condensing tower, in which caustic potassa solution is descending. The result is a moderately strong solution of saltpeter. The process is very interesting, but its economy, in a commercial sense, is very questionable.

TRACKING STORMS ACROSS THE ATLANTIC.—The *Nautical Magazine*, of London has been tracking American storms across the Atlantic, and finds that 63% of those starting in this country reach Great Britain. As it takes them several days to make the voyage across the ocean, the proposed international exchange of meteorological reports by cable ought to enable the inhabitants of England to know very nearly what sort of weather they are going to have. As storms seldom cross from Europe to this country, we are not as much benefited by this interchange. It will be, however, of great advantage to us, as well as the whole world. Meteorology is a science developed but slightly. In time, the guesses of "Old Probabilities" will be reduced almost to certainties, and our farmers be enabled to know exactly what kind of weather we are going to have a week ahead.

A LARGE COLLECTION OF SPIDERS.—Capt. Holden, of Cincinnati, Ohio, is credited with an exceptionally valuable collection of spiders, numbering nearly 25,000 specimens, and embracing 4,000 species. They are arranged in bottles, with labels giving name, collector and locality. California furnished 5,000 specimens, and New England as many more. One species is represented by 108 specimens, from all parts of the United States, showing how much effect environment has in modifying form. The collection is supplemented by a full and complete catalogue of the literature of the subject, comprising about 70,000 references on 10,000 cards. This valuable contribution to the study of this little-known branch of natural history he hopes to complete and publish at an early day.

The Electric Candle in Vacuum.

Sir Humphry Davy was the first to note that the voltaic arc became longer when confined in vacuum, and that the carbons were not consumed. In Jamin's experiments with the electric candle in vacuum, it has been found that when thus confined, or when hermetically sealed in vessels containing inert gases, the carbons are not acted upon. Such a gas is nitrogen, acetylene, carbonic oxide and marsh gas. Most other gases are decomposed by the arc; for example, steam gives carbonic oxide and acetylene, carbonic acid doubles its volume and changes into carbonic oxide, and the hydro-carbons, especially vapor of petroleum, is decarbonized, and produces filaments of coke connecting the carbon points. This action is employed to good purpose in fabricating the carbon loops for the Maxim incandescent light. Air in the sealed vessel offers a peculiar interest. First, there are seen vapors produced by the combination of oxygen and nitrogen; but this combination is soon destroyed, and the gas appears colorless again, because of the oxygen combining with the carbon. Nitrogen and carbonic oxide then remain in the vessel. While the hyponitric acid vapors are in the vessel the arc changes in tint and elongates; but at last, when the chemical transformations are complete, the arc is good and of a greenish blue. The important point, however, it is stated, in a practical sense, is that it becomes quite fixed, and varies neither in color, position or intensity, as all naked arcs, however well regulated, still do. The spectrum is that of carbon raised to incandescence without burning, a spectrum such as has been observed in the tail of the recent comet by M. Thollon.

On the other hand, the spectrum of a naked arc glowing in the air is complicated by that of burning carbon. In an inert gas, therefore, the arc is a purely electric phenomenon, and it can be directed by electro-magnetic action. The ordinary arc, again, is composed of this electric incandescent current, and the flame due to the burning carbons and their irregular waste. The cessation of burning also stops the waste of carbons. When the Jamin candle burns in the open air it is consumed at the rate of 16 millimeters per hour; when closed in a sealed vessel this consumption is reduced to 0.2 millimeters per hour. Each candle lasts 160 hours, or 16 times longer than when burned free, and each lamp 800 hours, or 80 nights of 10 hours each. Not only the fixity of the arc, but its durability, is thus very much increased.—*Iron Age.*

THE ACTION OF OXYGEN ON MERCURY.—It is currently believed that oxygen combines to a small extent with mercury at ordinary temperatures, but recent experiments of M. Amagat, communicated to the French Academy of Sciences, have demonstrated that when both these bodies are pure and dry they are without action upon one another, at least for a considerable time. The above error was introduced into science on the high authority of Reguault. M. Amagat arrived at his results by means of a Pouillet apparatus, having nitrogen in one manometer and oxygen in the other, with the metal in presence of both. Although kept for more than a month in the apparatus, the surface of the mercury in presence of the oxygen remained as brilliant as that in presence of the nitrogen.

SPECTRA OF FIRE FLIES.—During the past summer Mr. W. G. Levison, of Brooklyn, N. Y., has studied the spectra of the light of fire flies and other light-producing insects. He finds that the ordinary small species of fire fly gives a spectrum from which the blue and violet are omitted, and that in all cases examined the less refrangible rays predominate. Phosphorescent oils and glowing phosphorus give a spectrum consisting of green light only. A fire fly that is injured and glows permanently seems to give a nearly similar spectrum, but the bright light given by the insect when living affords an entirely different spectrum, as mentioned above.

GREEN AND RED LIGHTS IN VEGETATION.—Why will grass not grow under our trees? M. Paul Bert has shown that green light hinders the development of plants. Plants inclosed in a green glass frame wither and die as though they were in darkness. M. Regnard finds that plants specially require the red rays. If sunlight is deprived of the red rays the plants soon cease to thrive.

AN ASTRONOMICAL CONGRESS is about to be held at Strasburg, which will be visited by many eminent astronomers from all parts of the civilized world. Strasburg was chosen because in its new observatory the best and most modern astronomical apparatus are to be found.

LEMON JUICE IN DIPHTHERIA.—Dr. I. R. Page, of Baltimore, calls the attention of physicians, in the *Medical Record*, to the topical use of fresh lemon juice as a most efficient means for the removal of membrane from the throat, tonsils, etc., in diphtheria. He states that in his hands it has proved the best agent that he has as yet tried for the purpose. He applies the juice of the lemon to the affected parts every two or three hours by means of a camel's hair probang. In 18 cases in which he has used the remedy the effect has been all that he could have wished. He finds that several of his professional brethren are prepared to give the same favorable account of the remedy.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Sept. 8.		Week Ending Sept. 15		Week Ending Sept. 22		Week Ending Sept. 29	
Alpha	3¾	....	4¾	3.90	4½	3.95	3.80	3.60
Alta	4.80	4.40	5	4¾	5¼	5	5⅝	5½
Andes	1.60	1.05	2.30	1.70	2.30	1.70	2.40	1¾
Albion	2.20	1¾	1.95	1.70	1.95	1¾	1.95	1.80
Argenta	....	....	....	....	15c	....	5c	....
Addenda	20c	15c	20c	....	20c	15c	17c	10c
Belcher	3	2.60	3.30	2¾	3.35	9	3¼	2¾
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	12¾	11⅜	16	13	15½	12¾	14½	12⅝
Bullion	1.15	80c	1.30	1	1¼	60c	70c	65c
Bechtel	1.05	80c	1	95c	90c	75c	85c	75c
Bel Isle	15c	....	15c	....	....	....	10c	....
Bodie	9⅝	9¼	9	8¾	8¼	8	8	7
Benton	95c	85c	1.05	95c	1.15	1	1.10	1
Bulwer	....	....	2¼	2¼	2¼	....	2¼	....
Boston	20c	10c	....	....	....	....	15c	....
Black Hawk	15c	....	20c	15c	....	....	20c	....
Belvidere	....	....	....	....	25c	10c	....	....
Booker	5c	....	....	....	5c	....	....	....
Caledonia	30c	25c	45c	30c	40c	20c	25c	20c
California	95c	90c	1.10	90c	1	95c	1.20	95c
Challenge	80c	....	95c	65c	90c	80c	80c	....
Chollar	2¼	2.20	3.20	2.40	3	2¼	2.70	2¼
Credeger	3¾	....	5	3.80	4	3¾	3¾	3.60
Con Imperial	15c	10c	15c	10c	20c	10c	25c	10c
Con Virginia	1.95	1.85	2¼	1.90	2.20	1.90	3.40	2.20
Crown Point	2.15	1.90	1.90	1.65	1.90	1.60	1.70	1¼
Columbus	....	....	....	....	....	....	25c	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	1¼	....	1	....	1	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2.30	2.15	2.15	2	2.30	2.05	2¼	2.30
E. Mt. Diablo	20c	15c	25c	20c	35c	30c	40c	25c
Eureka Con	28	27	27¾	27	27¾	27	27½	25½
Exchequer	1¼	1.05	1.35	1	1.30	1	1.10	1
Endowment	....	....	....	....	....	....	....	....
Grand Prize	50c	35c	40c	....	40c	....	30c	....
Golden Gate	2½	....	....	....	....	....	2.80	....
Goodshaw	....	....	50c	45c	45c	....	40c	35c
Gould & Curry	7¾	6¾	9	7¾	8¾	7	9¾	7¾
Hale & Norcross	4.05	3¾	4.90	4	4.60	3.80	4.40	9.90
Head Center	1	....	....	....	....	....	1	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	40c	35c	50c	40c	50c	30c	25c	....
Justice	75c	70c	90c	70c	1.10	30c	1	90c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2	1.60	1.80	1.60	1¾	1¼	2.30	2.15
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	20c	15c	20c	15c	25c	15c	20c	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	1¼	....	....	....	....	....
Martin White	50c	....	90c	60c	1¼	....	2¼	2
McClinton	....	....	10c	5c	10c	....	5c	....
Mono	4	3.55	3.65	3.30	3	2¾	2¾	2.10
Mexican	10¼	9¾	14¾	11¼	14	11	12¾	11¾
Mt. Diablo	6¼	....	6¼	6¼	6¾	....	6¾	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	90c	80c	85c	45c	65c	50c	55c	50c
New York	....	....	20c	15c	15c	10c	15c	....
Northern Belle	17¾	16¾	17¾	16¼	14¾	11¾	13¾	11¾
North Noonday	50c	....	....	....	....	....	....	....
Navajo	....	....	25c	....	35c	25c	50c	....
Occidental	1¾	....	1.55	1¼	1¾	....	1¾	1.45
Ophir	6¾	6¼	9¾	7	9¼	7¾	9¾	8¾
Original Keystone	....	....	....	....	....	....	....	....
Overman	2	1¾	2.90	2	2.95	2.55	2.40	2.15
Oro	50c	40c	45c	40c	65c	55c	70c	65c
Paris	....	....	....	....	....	....	....	....
Potosi	3.30	3	3.80	3.30	4.10	3.15	3¼	2.95
Queen Bee	....	....	....	....	....	....	5c	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	3.30	2¾	3.60	3.05	3.60	2.80	3.20	2.85
Seg Belcher	8	6¾	9¾	7	9¾	9	9	8
Sierra Nevada	16¾	14¾	23¾	19¼	28¾	18	24¾	20¼
Silver Hill	10c	....	15c	10c	40c	30c	30c	20c
Silver King	19	15¾	19	17	19¼	18¼	18¼	18¼
Snccor	....	....	....	....	....	....	....	....
Summit	25c	....	30c	25c	25c	....	35c	....
Scorpion	1.70	1.55	2.05	1.85	2.60	1.90	2.40	2
Solid Silver	....	....	....	....	35c	....	35c	....
South Bodie	5c	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	45c	....	40c	....	45c	....	40c	....
Tioga Con	40c	25c	25c	....	50c	40c	40c	....
Tiptop	5¾	5¼	5¾	5¼	6	5¾	6	5¾
Tuscarora	....	....	....	....	20c	....	20c	....
Union Con	13¾	12¾	19¼	15¼	19¼	13¾	16	14¾
Utah	10¾	9¼	14¾	11	14¼	11¾	12¾	11¾
Ward	....	....	....	....	2¾	....	....	....
Wales	90c	80c	....	....	80c	....	....	....
Yellow Jacket	5¾	4.80	6¾	5¼	6	4.80	5¼	5

Sales at S. F. Stock Exchange.

Thursday A. M., Sept. 29.

95	Alta	5¾@5¾	
100	Andes	.2	
20	B & Belcher	.13	
840	Belcher	.2.70@2¾	
430	Bullion	.70@65c	
160	Benton	.1.05@1.10	
100	Confidence	.3.60	
280	California	.1.05@1.10	
2105	Con Virginia	.2.70@2.85	
120	Crown Point	.1¾@1.55	
150	Chollar	.2.70	
3000	Con Imperial	.20c	
480	Exchequer	.1	
330	Gould & Curry	.9¼	
860	Hale & Nor	.4@3.10	
250	Justice	.1c@95c	
130	Mexican	.12¾@12¾	
500	New Wells Fargo	.15c	
315	Ophir	.8¾@8¾	
530	Overman	.2.05@2.15	
185	Potosi	.3.40@3¾	
1810	Savage	.3	
2270	Sierra Nevada	.24@24¾	
355	Scorpion	.2.30@2¾	
380	Utah	.12¼@11¾	
645	Union	.14¾@14¾	
445	Yellow Jacket	.5@5¾	

Afternoon session.

500	Albion	.1.90	
100	Addenda	.15c	
160	Black Hawk	.15@20c	
200	Belle Isle	.10c	
70	Bodie	.6¾	
150	Belvidere	.10c	
50	Bechtel	.75c	
700	Belcher	.2.75	
50	Boston	.10c	
1050	Day	.2.30@2.40	
300	E Mt Diablo	.20c	
50	Eureka Con	.26	
300	Holmes	.50c	
100	Manhattan	.21	
200	M White	.2.10	
635	Mono	.2@2.05	
1250	Noonday	.50c	
50	N Belle Is	.30c	
75	Northern Belle	.11¾	
50	Oro	.75c	
400	Pinal	.2.10	
300	Syndicate	.40c	
215	Silver King	.17¾@17	
200	Tiptop	.6	
100	Tioga Con	.30@35c	
600	Tuscarora	.20c	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Germania, 22d, $1,275; Hananer, 22d, $2,000; Frisco, 22d, $10,932; Bullionville, 22d, $2,357; Horn Silver, 22d, $10,000; Tintic, 22d, $4,538; Horn Silver, 23d, $17,500; Barbee & Walker, 23d, $1,824; Bullion, 23d, $6,925; Mayflower, 23d, $2,595; Hanauer, 24th, $1,995; Germania, 24th, $2,750; Horn Silver, 24th, $7,500; Tintic, 24th, $1,987; Mammoth, 24th, $2,600; Bullionville, 24th, $400; Horn Silver, 25th, $2,500; Wood River, 25th, $3,550; Germania, 25th, $2,950; Christy, 24th, $2,059; Northern Belle, 24th, $10,375.49; Head Center, 26th, $4,323; Ophir, 23d, $2,098.54; Bodie, 26th, $7,026; Western, 27th, $15,720; Mark Morris, 21st, $5,256; Emigraut, 25th, $10,000.

HAILEY is now the county seat of Alturae county, Idaho, having, at the recent election, beaten its rival town of Bellevue. Hailey now claims to he the hoss town of the Wood River section.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes M Co	Nevada	17	50	Aug 8	Sept 14	Oct 3	B Burns	309 Montgomery st
Argenta M Co	Nevada	9	10	Sept 5	Oct 7	Oct 28	F M Hall	327 Pine st
Belle Isle M Co	Nevada	3	10	Sept 13	Oct 18	Nov 8	E M Hall	327 Pine st
Boston Con	California	2	120	Sept 15	Oct 21	Nov 12	F D Luty	330 Pine st
Bullion M Co	Nevada	21	1 00	Sept 21	Oct 26	Nov 15	J M Brazell	328 Montgomery st
Belvidere M Co	California	12	25	Sept 22	Oct 29	Nov 21	C V Hubbard	310 Pine st
Champion G & S M Co	California	9	25	Sept 19	Oct 25	Nov 15	B Burns	309 Montgomery st
Chollar M Co	Nevada	6	50	Aug 29	Sept 20	Oct 21	W E Dean	309 Montgomery st
Con Imperial	Nevada	18	10	Aug 23	Sept 27	Oct 18	W E Dean	309 Montgomery st
Con Virginia M Co	Nevada	16	30	Aug 2	Sept 24	Oct 22	A W Havens	309 Montgomery st
Crown Point G & S M Co	Nevada	45	75	Sept 7	Oct 12	Nov 2	Jas S Newlands	327 Pine st
East Mt. Diablo	California	2	10	Sept 27	Oct 31	Nov 21	G W Fisher	324 Pine st
Independence M Co	Nevada	8	15	Aug 25	Sept 26	Oct 17	E M Hall	327 Pine st
Junista Con M Co	Nevada	5	04	Aug 18	Sept 19	Oct 8	C V Hubbard	310 Pine st
Julia Con M Co	Nevada	16	20	Sept 16	Oct 21	Nov 11	H A Charles	419 California st
Justice M'Co	Nevada	35	25	Sept 13	Oct 18	Nov 8	R E Kelly	419 California st
Kentuck M Co	Nevada	16	50	Aug 22	Sept 26	Oct 17	A O Stuart	234 Montgomery st
Maybelle Con M Co	California	9	20	Sept 20	Oct 26	Nov 18	W J Taylor	310 Pine st
Meadow Valley M Co	Nevada	16	39	Aug 1	Sept 10	Oct 4	H DeLaguna	414 California st
Mono M Co	California	13	50	Aug 6	Sept 12	Oct 3	W H Lent	309 Montgomery st
Mt Potosi M Co	Nevada	7	15	Aug 12	Sept 17	Oct 10	J H Sayre	330 Pine st
Murchie G & S M Co	Nevada	7	15	Sept 7	Oct 11	Nov 10	Wm Letts Oliver	329 Montgomery st
Occidental Con Gravel M Co	California	8	06	Aug 22	Oct 3	Oct 26	W T Smith	414 California st
Potosi M Co	Nevada	6	50	Aug 29	Oct 4	Oct 25	W E Dean	309 Montgomery st
Savage M Co	Nevada	47	50	Sept 5	Oct 7	Oct 27	E B Holmes	329 Montgomery st
Tioga Con M Co	California	14	20	Aug 16	Sept 22	Oct 12	W H Lent	309 Montgomery st
Wide Awake M Co	Arizona	14	10	Sept 16	Sept 21	Nov 12	C Hildebrandt	Bush & Kearny sts

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M Co	California	3	15	Aug 22	Sept 22	Oct 10	J M Buffington	909 California st
Alpha Hydraulic M Co	California	3	25	Aug 20	Sept 27	Oct 18	J Ireland	216 Sansome st
Bengal M Co	Arizona	1	02	Aug 31	Oct 7	Oct 29	J H Sayre	330 Pine st
Defiance G M Co	California	6	05	Aug 26	Sept 30	Oct 20	W H Lent	309 Montgomery st
Delano M Co	California	2	03	Aug 13	Sept 16	Oct 7	J Morizo	328 Montgomery st
Harrington M Co	California	2	05	June 15	Sept 14	Oct 4	C C Muller	409 California st
Iowa M Co	Nevada	14	05	July 27	Sept 12	Oct 5	C S Leavitt	411½ California st
New Basel Con Gravel M Co	California	—	10	Aug 25	Oct 1	Oct 20	F X Simon	525 Commercial st
North Gould & Curry G & S M Co	Nevada	1	25	July 5	Sept 15	Oct 12	M C Southard	331 Montgomery st
North Sierra Nev Co	Nevada	3	10	Sept 19	Oct 27	Nov 17	C C Harvey	309 California st
Navajo M Co	Nevada	8	25	Aug 19	Sept 22	Oct 13	J W Pew	310 Montgomery st
Oro M Co	California	9	25	Aug 16	Sept 21	Oct 12	W Stuart	220 Sansome st
Peahody G M Co	California	1	04½	Aug 31	Oct 3	Oct 21	R D Hopkins	317 Montgomery st
Santa Anita M Co	California	1	13	Aug 20	Sept 25	Oct 10	J B Titus	34 Kearny st
South Hite M Co	California	2	10	Sept 1	Oct 5	Oct 29	T A Berlin	515 California st
Spaulding G & S M Co	California	2	10	June 23	Sept 23	Oct 21	J W Pew	310 Pine st
University G M Co	California	9	10	Aug 15	Sept 20	Oct 12	Wm. L Oliver	328 Montgomery st
Western Home Con M Co	Idaho	2	05	Aug 16	Sept 26	Oct 25	A Halsey	328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Aurora Tunnel	Nevada	C V Hubbard	310 Pine st	Annual	Oct 5
Belle Isle M Co	Nevada	E M Hall	327 Pine st	Annual	Oct 2
Eureka Con	Nevada	W W Traylor	309 Montgomery st	Annual	Oct 17
Golden Gate Con	California	J T McGeoghegan	319 Pine st.	Annual	Oct 8
Hillside M & M Co	Nevada	F Frankenthal	330 Pine st.	Annual	Oct 1
May Flower M Co	California	J Morizio	323 Montgomery st	Annual	Oct 3
Red Cloud M Co	Nevada	W J Taylor	310 Pine st	Annual	Oct 12

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Sept 27
Father De Smet M Co	Dakota	H Dean	New York	50	Sept 10
Northern Belle M & M Co		Cal Willis	309 Montgomery st	50	Sept 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Sept 15
Silver King M Co	Arizona	J Nash	315 California st	25	Sept 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Sept 12
Tip Top M Co	Arizona	H Deas	309 Montgomery st	20	Aug 26
Western M Co	California	C S Curtiss	309 Montgomery st	75	Sept 10

Mining Share Market.

There seems to he no special excitement in the stock market, and fluctnations have not heeu marked. On the Comstock, the big snction fan at the mouth of the Consolidated Virginia shaft is doing good work. It was drawing out and sending up an immense volnme of steam. It will soon cool off the lower levels of the California and Consolidated Virginia mines. Men have heen set to work at all the important points in the two mines.

At the Yellow Jacket they will eoon make a connection between the 3000 and 2828 levels, which will enable them to do some prospecting that will probably develop something of value. It is known that they have a solid body of qnartz over 80 ft. in thickness that shows low essaye in the only place where it was ever explored, even with the drill.

The *Enterprise* says: Although the management of the Sierra Nevada are reticent in regard to what is heing done and what is to he seeu at the hottom of the joint Union Consolidated winze, yet enough hes heen said ahont the condition and prospects at that point to warrant as high or higher pricee than the stock of that coupany reached at any time after it was announced that ore had heen found. Undonbtedly at the time Senator Fair gave it as his opinion tbat what had heen found was an ore body, and gave the public to nnderstand that the whole hottom of the winze was in ore, he was eaying what was so and what he believed would prove to hs the case. As the wiuzs must have heen in ore for some distance before sufficient was fonnd to cover the hottom of the winze, and as it would he necessary to sink considerahle fnrther before the ore would pass ont of the winze, there mnst have heen a deposit sufficient to justify any advance in the stock that has been seen. We know that at one time snfficient ore was eeen in the hottom of the winze to warrant Senator Fair in helieving that an ore body had been fonnd, and we do not yet know that the ore has left the winze; indeed, he himself says that only the management and the men that are doing the work can say that the bottom of the winze is not still in ore. What has heen fonnd will no douht he made known when it ie thonght hy the officers of the company to he for the hest interests of stockholders to throw the mine open to the public. Until the proper time arrivss it is not likely that any outsiders will he allowed in the mine, for to let in one man is equivalent to throwing the mine open to the public. There is a considerahle flow of water to he handled, hnt the work of exploring the ore fonnd is undouhtedly heing pnshed as rapidly as possihly.

FROM El Dorado comes the newe that Salkeld & Eckhardt have closed a contract for the immediate erection of a 20-stamp quartz mill at the Monnt Pleasant mine, Grizzly Flat.

Copper in New Mexico and Arizona.

The lively interest in the copper properties of Arizona and New Mexico hae given rnmor tbat the President of the Calumet and Heola company, Prof. Alexander Agassiz, is about visiting the Southwest with a view of thorqughly investigating the mines of that fahulously rich region. Prominont English mining experts are now visiting the Old Dominion copper mines in the interest of a syndicate of English capitalists. They state that the Old Dominion has the richest copper vein ever nncovered. And it is not an improhable statement to make that with such reports as come to the surface respecting the great ontcroppings of the Old Dominion, and the rich discoveriee now heing made in New Mexico, that the price of the Calumet and Hecla shonld he in at the fore. There is no reason to snppose that any very decided chenge would take place in the stock of the Calumet, and yet great mines are not unlike great men, they have their day; and shonld it he a fact that Prof. Agassiz sees well the situation, he, in his keen observation, is donbtless intent upon a thorough investigation of Arizona and New Mexico copper properties. Calnmet has attained the apex in mining very few can expect to reach, and it is not improhahle, should the professor recognize either of the great copper interests of the Sonthwest, a connterpart to the Calnmet and Hecla may he found either in New Mexico or Arizona. Boston and New York have hoth a growing interest in the copper developments of the present day, and while Calnmet has inexhaustihle qnantities of copper rock, no one need he surprised should those in the control of this great honanza also be the controlling spirit of the coming copper bonanzas of the Sonthwest, first among whom may he the copper king, Prof. Alex. Agaseiz.—*New Mexican Mining World.*

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

PACIFIC GAS LIGHT CO.—Sept. 28. Object to construct and maintain works snitable for the manufacture of gas or other substance or material for purposes of illuminating, heating and all other purposes to which gas can be applied, and the sale, distribution and delivery thereof; the manufacture and sale of all kinds of machinery, instruments and appliances by which gas or artificial light of say description is now or may hereafter be applied to. The place of businese will be San Francisco. Directors—Frederick F. Low, Walter M. Castle, Egbert Judson, Henry M. Martin and Eugene E. Dewey. Capital stock, $2,500,000, divided into 25,000 shares, at a par value of $100 per share.

AMERICAN QUARRY CO.—Sept. 28th. Location, Kern Co., Cal. Capital stock, $10,000,000. Directors, R. H. Orton, W. G. Campbell, A. P. Flint, H. K. Belden, David Killing and H. H. Killing.

BRUSH CREEK G. M. CO.—Sept. 28th. Location, Sierra Co., Cal. Capital stock, $3,500,000. Directors, A. Bateman, H. H. Pearson, William Thomas, A. C. Wigbtman, S. E. Olmstead.

MINING SUMMARY.

The following is mostly condensed from journals publisbed in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

PACIFIO GRAVEL M. CO.—Cor. Amador *Dispatch*, Sept. 24: This company is operating at the beadand a little aortb of a locality known as Union Flat. It is generally supposed by all, or nearly all of tbe old residents of tbis mining district, who have made mining a study of a lifetime, that in snd under the ridge which this company is penetrating, an immense gold-bearing bed of gravel exists So strong is this belief in the minds of many, that their hopes are drawn from other worthy and more extensive enterprises and centered in this and circumjacent vicinities, and declare that the fate of our town rests upon this problem. The tunnel which is now bcing pushed energetically abead is in about 300 ft. It is designed by the company to continue work until a distance of 1,000 ft has been traversed, where the projectors believe the deposit exists. Work was commenced on this enterprise in the latter part of May last. I am told that improved machinery will soon be put in operatiou which will greatly accelerate the work. Several of our townspeople have considerable money invested in this undertaking. Mr. James Dean, an enterprising and ambitious young man is secretary of the company.

PIONEER DISTRICT.—*Ledger*, Sept. 24: This little mining camp, our correspondent says, continues quite lively. Mace's quartz mill has just started on 75 to 100 tons of rock of rich quality. The quartz mill runs during the night and the saw-mill during the day time. The McQuade, Cossack and Soto claims are still taking out ore. The work of sinking at the Volunteer mine is greatly retarded by the flow of water. The present hoisting facilities are totally inadequate to dispose of the water. It is tbought that the moisture comes from the ditcb, which flows witbin 50 ft of the sbaft. The Volcano G. M Co. will commence work in preparing for tho winter's operations next month. The Kennedy mill has been started up recently.

SUTTER CREEK.—Taking water out of the Mahoney shaft is progressing so rapidly that they expect to reach the bottom in a few days. It is probable that in the lower levels the accumulations of mud will require a week to remove. The mill is kept running on rock from tbe upper levels. At the Down's mine everything moves smoothly. Sinking will probably be continued at tho Amador Con. for two months yet, which will bring the shaft to a depth of at least 1,000 ft, when tunneling will be vigorously pushed forward. Baling water out of the Wildman is very slow work. It seems impossible to reduce tho water with present baling facilities.

CALAVERAS.

WATER.—Angels *Echo*, Sept. 24: The Union Water Co. expect to complete their big reservoir in the mountains in about two weeks. Owing to the lack of water, work has been suspended on the Raspberry mine for a few weeks. The water will be turned ont of the Union Water Co.'s ditch on October 1st, for the purpose of repairing the same. Very little mining will be done in this section for a month or so to come except by those who are not dependent on tbo Union Water Co. for water supplies.

THE shaft on the Jones mine is down about 75 ft, and they have commenced drifting northward. The ore, so far, looks well, and there is every indication that it will prove rich in silver.

EL DORADO.

FOROING AHEAD.—*Republican*, Sept. 20: The Faber gold mine, Marblo valley, Latrobe district, which has yielded considerable sums heretofore, principally in pockets, as high as $2,000 having been realized from the effects of a single blast, is now being systematically worked, with a view to opening a first-class mine in first-class shape. The shaft is now down 140 ft, and drifting has been commenced upon the ledge. Mr. W. W. Faber was in town on Saturday last to hire two or three good quartz miners, but had not been able to find any, out of employment, tbe last we saw of him, which speaks well for that industry in this vicinity.

INYO.

WORK RESUMED.—Inyo *Independent*: The Laura Co. has resumed the work of developing its property at Beveridge, having put on a force of 8 men during the week. There are now about 40 tons of very high-grade gold ore on the dumps, and many parties who have visited the property adjudge it to be even better than the famous Keynot. The Mexicans have put a much stronger force on the Keynot, and bave added greatly to their transportation facilities—the pack train. J. W. Murphy has purchased a train of pack mules from Al. Rohinson, for general work in the district, and especially to keep supplied the store and boarding house at tbo mill

MINING NOTES FROM BISHOP.—The followiog brief mining notes from the recently opened gold mines of Bishop Creek, from a reliable correspondent, comprise the latest information we have from thore: "The Poleta shaft is down about 265 ft, showing a splendid vein of the rich ore characteristic of the series; but no one, save the managers, can tell its average value in gold per ton. The vein is equal in width to tbe working shaft. The Red Cloud mine, owned by Rowan Bros. & Co, and under bond to Messrs. Loose & Russell, is now opened by a sbaft something over 100 ft deep, and shows a vein even wider than the shaft, and is more richer than that of the Poleta. Other important discoveries have been made lately—one about one mile and a half southeast of the Poleta mine, and owned by a number of Mexicans, which shows fine prospects in gold. It is called the Margnarita. Another one, which is located some 3 miles north of the Poleta, is called the Dauphin, the ore of which shows from 50 to 900 colors to the horn. This property is owned by Escalion, Whittaker and others. It is opened by a shaft about 10 ft deep, and the ledge so far has a uniform width of 4 ft."

BUILDING UP.—The town of Bishop Creek is rapidly improving, and, backed up by its extensive agricultural interests and the rich and most important new gold discoveries, is doubtless as prosperous a community as there is in tbe entire State, and with as bright a future before it.

LOS ANGELES.

PLACER MINES.—Los Angeles *Commercial*, Sept. 24. Mr. W. W. Jenkins, who bas just returned from San Francisco, has made arrangements for bringing out tbe water from the Sespe and Adams' creek by a ditch 14 miles in length to the Santa Feliciana placer mines. This enterprise will cost about $100,000. These gold placers are in Los Angeles county on the north side of the Santa Clara river and are very rich. The mines of Los Angeles are the oldest in California and have been worked for a generation, yielding at small expense over $6,000,000, and the work goes on every year. In the San Gabriel canyon are some fine quartz ledges, and every canyon from the San Fernando tunnel to the San Antonio is rich with various metals.

MARIPOSA.

MINE SOLD.—Mariposa *Gazette*, Sept. 24: Mr. A. G. Black, of Bull Creek, who was here last Tuesday, informs us that the Compromise quartz mine, owned by him, has met with a bonafide sale, and was on his way below to receive the cash. He did not inform us what amount the mine had been sold for, but insinuated that it was sold for the price he asked, and was a better sale than he really anticipated to make; besides it was sufficient to maintain him and his good wife in independent circumstances the remainder of their lives. Mr. Black has struggled for many years to make a raise out of mining, and has finally reached the goal of his long sought for happiness.

MONO.

BODIE.—*Free Press*, Sept. 27: The past week has been marked by no very great changes, but the usual work of

production and development has been in steady progress. The pump gear wheel of the Standard having given out no work was done in the shaft or the 1000 level of the mine. The new wheel is now on the way, and operations will soon be resumed at that point. At the Lent and Red Cloud shafts the usual amount of work is being performed. The west cross-cut from the 600 level of the latter is now in 172 ft. The stopes in the Ore mine continue to look remarkably well. That at the 440 level is 3 ft wide of very rich ore, while the 520-ft stope is 2 ft wide, also of exceedingly good ore. The concentrators are working successfully, and will doubtless run all winter. During the coming week it is likely that work will be resumed at the Champion mine. All of the mills, including the Standard, Standard-Bulwer, Neonday, Syndicate, Bodie, Silver Hill and Miners' are employed in crushing ore, and the bullion output is from $80,000 to $90,000 per week. Messrs. Adam Gillespie and John Wagner are about putting up heavy machinery for working tailings below the Bodie mill.

NEVADA.

Flooded Mines.—*Transcript*, Sept 23: Last Tuesday the valve to the new 10-inch pump at the Nevada City quartz mine got out of order, and before it could be put in working shape, the lower portion of the mine was flooded. The 8-inch pump recently taken out was put back, and with that and a drawing pump and tank the water is being kept below the 2d level. It will take some time to drain the mine. The Derbec gravel company is also suffering from too much water. A heavy stream was struck in the new shaft, and the men barely had time to get themselves out and save the pump. The water is now gradually lowering, and doubtless work will be progressing as usual in a few days. The Derbec has recently been giving employment to about 100 men, 20 of whom are said to be from this city.

Eureka Tunnel.—*Sentinel*, Sept. 22: The work in following up the recent development in this property is proceeding satisfactorily. The ore vein has been stripped a distance of 15 ft, and the drift stopped. Preparations are now being made to sink upon the ore, to determine its depth. A drift has also been started from the tunnel immediately opposite the one in which the ore was encountered, where an encouraging-looking streak of yellow chlorides is visible. If this meets with the same success as the other drift, the tunnel folks will be in high clover. The north drift nearer the mouth of the tunnel has reached the ore vein there found some time ago by following up a streak, and the face of the cut presents a very strong and encouraging appearance. It will take the limited force, however, some time to prosecute the work of development at three different points, and stockholders should not get disappointed if a real bonanza is not shown up in a few weeks. All the labor is systematically performed, and every blast promises better.

PLACER.

Developments on the O. K.—Placer *Herald*, Sept. 20: We learn from a reliable source that work on the O. K. mine, located near the Grass Valley road, about 2 miles north of Auburn, is being prosecuted quite vigorously by a Boston company, under the superintendency of Mr. B. L. McLain. It is expected soon to have the property in a shape that it will pay. The new shaft is now 60 ft deep, showing a ledge from 2 to 4 ft in thickness, of good milling ore. A drift has been started at the 50 level. The early history of this mine is good, there having been several crushings made from it that paid from $20 to $135 per ton.

PLUMAS.

The Corbin & Manson Mine.—Plumas *National*, Sept. 24: On Wednesday last, in company with Mr. Manson, a *National* reporter took a look through the rich drift claims at Elizabethtown, purchased by these gentlemen from Loring & Leavitt some months ago. Since coming into possession they have made many improvements, and intend to work the whole flat as rapidly as possible. The pay-dirt is now being taken from two shafts near the head of the claims, one of which has been put down by the new owners. The pay is found wherever the bed-rock is favorable, but particularly in the large crevices, and occasionally the drifters uncover one that brings to light a clean-up of sluzs and chispas that would take a '49-er back to the palmy days. Something over $600 came out last week, and the day we visited the shaft they were getting the coarse black gold which indicates the right lead. The dirt is raised from these shafts by horse-power, and as the drain tunnel takes out the water at this point, this method is probably the most economical. One thousand ft. below these shafts a new one is being put down, the 15-horse power engine which was used in the Mylert & Hughes shaft having been moved there to do the hoisting and pumping. Under the able management of Mr. Manson, this machinery is now in splendid working order, and a boy 10 years old could perform all the labor required in running it. The shaft is substantially timbered, being down about 50 ft. Bedrock will be reached next week, at the depth of about 75 ft. The drain is considerably above bedrock at this point, and the water from the shaft is pumped into it. So far, the water is light, and there is no indication that it will prove troublesome. From this shaft, when down drifts will be run both east and west, and when the pay channel is uncovered it will be followed. A few hundred ft above and to the left of the shaft is the break from the famous "Cloyd claim," and undoubtedly some very large gold will be found opposite and below that point. If this shaft develops as much good ground as is expected of it, the Co. will put on another engine, near the lower end of the O'Neill ranch, to test the ground at that point and work it if the pay is found. The new Co. evidently proposo to work the ground thoroughly, and in a business-like manner. They are now employing about 25 men, all the miners being under the direction of Mr. W. Meikle, who seems to be thoroughly up in his business. The prospects of the Co. are certainly good, and we hope to see them find the ground even better than they anticipate.

SIERRA.

Gold Bluff.—*Mountain Messenger*, Sept. 24: Last week we visited the Gold Bluff quartz mine, 1 mile above town. Mr. Vansyke, the owner, entertained us hospitably, and showed us through the works. The ledge is about 12 ft wide, and they have raised on it about 70 ft. It is a heavy body of good pay ore between well defined walls. He has a 12-stamp mill running days only. Twelve men are employed about the mine. Since the mill was started, the amount of amalgam taken from the plates each day has averaged about 12½ ozs. Mr. Vansyke is working carefully, and will, if he has no bad luck, make this one of the best mines in this county.

Leffel Turbine.—The Good Hope quartz company has just received a 70-horse power turbine wheel to be used at the 20-stamp mill above town. The work is progressing favorably on the mill.

NEVADA.

WASHOE DISTRICT.

Sierra Nevada.—*Enterprise*, Sept. 25: The east drift joint with Union Con. has been extended 18 ft. On the 1600 level are putting in a discharge pipe for the Union shaft to the Sutro tunnel. On the 2500 level east crosscut No. 1 has been extended 18 ft; crosscut No. 2, 21 ft, and crosscut No. 4, 19 ft. The main north lateral drift has been extended 9 ft.

Union Con.—On the 1600 level a discharge pipe is being put in to the Sutro tunnel from the Union shaft.

Mexican.—The Mexican and Union winze on the 2500 level has been sunk and timbered 8 ft.

Opher.—The joint Mexican east crosscut has been extended 20 ft; total, 120 ft. Repairing the north drift joint with Californus.

California.—The only work being done in this mine is at repairing the north drift on the 2500 level. We expect to have the large suction fan completed to-morrow (Sunday) night.

Con. Virginia.—Work has not yet been resumed in the mine in consequence of the intense heat.

Union Shaft.—Are repairing the 1600 drift to the Sutro tunnel and putting in an extra line of discharge pipe to said tunnel.

Yellow Jacket.—During the past week the north lateral drift on the 3000 level has been extended 38 ft, making the present length of the same 250 ft from the switch. The ground continues hard and dry. The north winze below the 2828 level has been sunk and timbered 27 ft, making the present depth 194 ft on the slope. The bottom is quite hard and dry. The Belcher and Crown Point dump has been started, reducing the quantity of water pumped to about 55 inches. All the machinery of the mine is in good condition and working well.

BARBEE DISTRICT.

Ore.—*Silver State*, Sept. 26: We learn from Alex Wise, who visited Barbee district, in the Humboldt range, last week, that there is considerable ore in sight in one of the mines which is being developed by Judge Barbee. The ledge has been uncovered for quite a distance, showing a strong vein, carrying ore in paying quantities.

BRISTOL DISTRICT.

The Mill.—Pioche *Record*: The Bristol mill started up last Wednesday, for the purpose of experimenting a little with the ore which will be put through raw, and if the returns prove satisfactorily, the mill will be turned into a wet crusher, thus dispensing with the roasting process and enabling the working of twice the quantity of ore that was formerly put through. If such prove a winning venture, the output will foot up between $50,000 and $60,000 per month. An extraordinary showing for a 10-stamp mill. The company has in the Mayflower a mine, which for the grade of ore stands to-day without an equal on the coast. The bottom of the winze on the 240 level is in $150 rock, while the face of the drift going southeast from the same winze, which is 40 ft, shows a 5-ft vein of ore running up in the thousands, with an average of $268 per ton. The mean average of 12 assays taken yesterday by Supt. Ross showing the above result. The mine, the way it stands to-day, is a bonanza well worth its millions, and will undoubtedly be the means of bringing Bristol to the front as one of the leading bullion-producing camps in the State. One boom is always followed by another. We are now at the hight of our mining boom, and as a material consequence, we are to have another one on top of it in the shape of a building boom. There is going to be no less than half a dozen new buildings going up this month for business purpose, and a score or so of dwelling houses. Real estate has already advanced upon the impetus of the late strikes over 100% during the last 20 days, and before snow flies Bristol will be one of the liveliest camps in the State. The Day furnace is now ready to start up. The new boiler has been placed in position, and the necessary connections made. More teams have been put on hauling ore, and from 25 to 30 tons are now coming down daily.

CANDELARIA DISTRICT.

Northern Belle.—*True Fissure*, Sept. 24: The shaft levels are looking about the same as last week, and producing the usual quality of ore. The 10th and 11th levels show fully as well as last reported. The levels above present no material change. The 6th and 6th continue their usual yield, and the development above the 4th is looking well. In other parts of the mine there are no changes worthy of note. There are being extracted and sent to the mills about 80 tons of ore daily. Both mills are running steadily, and doing the usual amount of work. Bullion shipments for the week ending Sept. 21st, $27,161.10. Total shipments on September account to Sept. 21st, $00,648 31.

EUREKA DISTRICT.

Strikes.—*Sentinel*, Sept. 23: Important strikes in the mines of this district are becoming very numerous of late. We have two more to report this morning. Both are very valuable, as well for the future of the district as for their intrinsic merit. The Seventy-Six mine is a short distance above the mouth of New York canyon. Mr. Luther, who has had charge of the property, has devoted the closest attention to the work of development. He has at last cut into a bonanza of considerable magnitude on the lower level of the mine. The drift has penetrated the ore about 6 ft. The ore is on three sides, and in the face of it. Average assays run $200 to the ton. The richness of the find, taken in connection with the seaming extent of the body, gives to it the brightest promise. The Deadbroke mine is owned by Martin Piantoni. It is located near the crest of Prospect mountain adjoining the Banner mine. Mr. Piantoni admits that he has just discovered a splendid body of high-grade ore on his 200 level. We have not been furnished the particulars beyond the bare announcement of the strike. The owner of the property is feeling especially jubilant, and there can be no question but that he has found something pretty big.

GRANTSVILLE DISTRICT.

Alexander.—*Bonanza*, Sept. 24: All work at the mine was continued without interruption during the past week. The chloride stope between No. 4 and 5 levels is opening up fine, and will produce a large amount of ore.

Brooklyn.—In the Brooklyn the west drift, No. 3 level, is now in from crosscut 114 ft, the whole length of same being through vein matter and quartz of a favorable character for striking an ore body soon. The upraise from No. 2 level, which is in chloride, is looking well and producing fine ore.

SAFFORD DISTRICT.

Men.—*Silver State*, Sept. 23: L. L. Rickard has just returned from a flying trip to Safford district, where he has coachee to convey passengers from the railroad to the mines. He says that there are 75 men in the district, and the number is increasing daily. The name of the new town has been definitely agreed upon, and it is to be known as Gerald.

The Outlook.—Cor. Eureka *Sentinel*, Sept. 23: The mining outlook here continues to improve. New strikes and locations are made every day, but little work is being done, except on a few locations. Capital is showing itself every day, but the holders of the most promising claims hold them at such prices as to frighten purchasers. The owners of the Contention are now engaged in sinking a shaft 50 ft deep, with the view of seeing whether or no the rich ore on the surface extends down to any depth. On the Illinois claim, adjoining the Contention, work is being done systematically, which will surely develop well. On the Bull's Head and Belcher ground developments will be made in a short time. In the Belcher, at a depth of 3 ft, a seam of rich ore has been uncovered. On the Sonora and Veida a force of men will be put to work to develop those properties. The Wallace has shown up a well-defined ledge. This claim lies at the base of the big mountain south of the Onondaga, and it is supposed by experts that the vein assumes a contact form there. The Rose, Fannie Ray, Maggie O, St. Julien, Grey Eagle (recent locations), lying south of the Wallace, from samples taken from the croppings, promise to even surpass the older locations in richness. The bonanza of the district will be found in this large mountain. The Amelia and Nettie, located by Joe Fryer of the Albion, will, by a little labor, demonstrate the fact that the great body of ore lies in this mountain. The Rose and Fannie Ray, located by Eurekans, and on top of the ledge, will in a short time develop into real bonanzas. The assays from the croppings will astonish the people.

Jumpers at Safford.—We are informed that some parties at Safford district have been jumping some of the mining claims during the absence of their owners. This is an abominable practice, and ultimately results in defeat, as the law allows locators of mining claims a year to work them after they are located, and once a claim is properly bounded, no power in the land can deprive a locator of his rights. We understand that some Eureka parties are the offenders; hence we would suggest to them that the sooner they quit the practice the better, as it reflects no credit on them. Parties in a new district should respect each other's boundaries, and if some were not fortunate enough to make favorable locations, they should not show their teeth by trespassing on the land of others.

ARIZONA.

Globe District.—*Chronicle*, Sept. 22: The prevailing fine weather and lull in the Indian excitement, has placed mining matters in this district again in a thriving condition, and renewed activity is noticeable in every camp. Reports from Richmond Basin are of a most encouraging nature. The out-put of ore from the Mack Morris is continually increasing, larger and richer bodies are being uncovered, and there is no question but that the company will soon require additional milling capacity. The East Richmond which joins the Mack Morris on the west end is making a splendid showing of ore at the bottom of the shafts as well as in the face of both drifts.

Mineral Creek.—Affairs are very quiet since the Indian excitement, but work is about being resumed with an adequate force. The Mineral creek mill is well guarded by a well-armed and provisioned force, and all is in order to start at short notice.

Little Chief.—Work has been commenced on this property and ore of good class is being taken out. This is a very promising property, the developments having shown a larger body of ore of good quality and high assay value in both gold and silver.

Tombstone.—*Epitaph*, Sept. 25: While there are no marked features to report for the last week there have been no setbacks in the yield of ore, which is ample to keep the mills running up to their fullest capacity. This of itself guarantees a larger bullion output for the month of September than has ever before been recorded of the district.

Tombstone Mine.—Everything is moving along with the customary smoothness. No. 3 gives a daily output of 60 tons. No. 6 is looking very well and turning out the usual amount of ore.

Contention.—They have connected the 400 level between the old and new shafts. In the south drift on the 400 level they have an 8-ft ledge that looks well. Are sinking a winze from the 400 to the 500 level in which the ledge looks equally well as above. On the 500 level the south drift is in 250 ft. On the 600, still cross-cutting, the drift being now 200 ft long, all in ledge matter. The stopes are all looking well and yielding their usual amount of ore, that goes forward to the mill, which is kept running at its fullest capacity. After paying the September dividend of $75,000 they carried a surplus of $83,045 forward to the reserve fund, which shows the affairs of the company to be in a healthy condition.

Grand Central.—Sinking in the main shaft has been resumed. The rock is not quite so soft as above the 200 level, but breaks well, and good headway is being made. The station is complete and is a spacious apartment, being 16x23 ft, and 10 or 12 high, solidly timbered and planked with the best Oregon pine. The machinery works quite as well as expected, and that is to perfection. Work on the ore dump is progressing.

Vinzina.—Sinking the main shaft continues with the most favorable indications of an ore body near at hand. The shaft is down 390 ft. Ore extraction, awaiting a decision on the question of a mill, is limited to 1 load, or 15 tons daily. The various breasts and stopes look quite as well as heretofore, and the ore is of very high grade. Had it not been for the 500 ton limit, the September output would have reached a round $100,000.

Silver Belt.—Cross-cutting continues with favorable indications of ore, the face of the cross-cut being in black spar, quartz and mineralized porphyry, all of them harbingers of ore in this district.

Stonewall.—Shipping ore to the Boston mill was reported last Thursday. Good results may be expected as it is rich in horn silver. Work is not being pushed with great rapidity as one shift of 3 men is able to take out ore in advance of any desire to ship the same.

Girard.—Ground was broken for the mill on Monday morning last, and is progressing rapidly.

Prompter.—The developments are quite flattering, the incline, which is down 140 ft, being all in ore. Two shifts of men are employed.

DAKOTA.

Bald Mountain Carbonates.—Black Hills *Times*, Sept. 23: From every quarter we hear of rich strikes and rumors of strikes. Mr. N. M. Henton and Mr. E. R Adams, the discoverer of the New Era mine, dropped into our sanctum to day and exhibited specimens of ore from the mine which were exceedingly rich. The gentlemen appear sanguine, and, we think with sufficient reason, that they have found a genuine carbonate vein, and furthermore it is not a blanket lode, but a true vertical vein. Rock selected at random has assayed $15 to the ton in silver with a trace of gold. A shaft has been sunk 50 ft. At the depth of 25 ft a cross-cut was made which developed carbonates. After passing through this formation the work was continued 25 ft further, through mineral all the way. The rock they are now in shows free silver in abundance. It is estimated the present ore will go 200 ounces of silver to the ton, and about 70% of lead. The inhabitants of the Bald Mountain district smile audibly when the mineral belt is defined as is now generally understood. They claim that although we are on a mineral belt, and a good one for this section of the country, the mineral belt, the El Dorado of the county, is over their way, as time and a little more work will conclusively show. We certainly have no objection. We think will be

The Black Range, New Mexico.

The New Mexico *Mining World* says: The mines are now accessible by the stage from Eagle depot, some 50 miles south of San Marcial, on the Atchison, Topeka & Santa Fe road. Hearn & McConkey run a six-horse stage to Fairview, and lighter vehicles to Chloride city and Grafton. The latter camp is highly favored by nature. It is well timbered, and sight creeks flow through it, in all of which running water can be found nine months in the year.

Chloride city is the pioneer camp of the range, beautifully located at the mouth of Chloride gulch. The stream of Chloride runs through the town, which has a population of 300 souls. The great drawback to this camp has been the obstinacy of prospectors in holding undeveloped claims at the figures of developed property, and thus repelling capital that would have been invested in the district, owing to the immense lodges and rich assay obtained from the surface croppings. The result of this policy has been to retard the growth of the camp, which would have been very rapid, and to cause a general stagnation of business in Chloride city. The prospectors have now realized the folly of their own policy, and are prepared to sell at reasonable prices.

The Cuchillo Negro range lies three miles southeast of Fairview. Several locations have been made on it. The ore is free-milling, carrying gold, silver and copper. The Know Nothing, owned by E. R. Blackman and E. A. Giles, is a full claim with a 12-ft. shaft and 4 ft. vein, running high in gold, silver and copper.

The Ivanhoe mine is located on Turkey creek, and owned by the Ivanhoe mining company. It is without a doubt the best mine yet discovered in the Black range. The nature of the ore is sulphuret, carrying an unusual quantity of free gold. Gold assays have run as high as $20,000 to the ton. Horn and brittle silver are also found in large quantities. The main shaft is 80 ft. in depth, and the tunnel has been run 190 ft. At the intersection of the shaft and tunnel, the vein is 15 ft. in width. A day and night shift are working, giving employment to 28 men.

Hermosa camp is part of the Black range, located on the Palomas river. The principal property owners are F. L. Wilcox and E. R. Chew. They have 30 claims and are now opening five, while most of the others show good mineral on the surface. The veins have a northeasterly and southwesterly trend, carrying native silver, silver glance, copper and galena.

Mineral city is a small camp started within the past two months, and contains about 30 men. The Dreadnaught, owned by J. N. Smith and others, is the first location on the Dreadnaught lode, which can be traced for eight miles. It is a well-defined fissure vein, and $25,000 has been refused for it.

Dry Creek camp is six miles north of Chloride city, and is extensively located. The most work is done on the Buffman, an open cut to tap the vein. It is 15 ft. in length, and a shaft has been sunk 20 ft. The pay streak is 18 inches wide, and the only wall yet struck is the porphyry. Free gold was found on the surface. The owners are C. Bishop and Wm. Penn. The Colossal and Wood claims, South Fork, are owned by Dr. Wood, J. H. Dorsey and others, and are handsome claims. They are sinking a shaft on the former and sorting ore for shipment to Pueblo. The pay streaks are three in number, the ore running 200 ozs. of silver to the ton, with a trace of gold.

Fairview is a new camp located on the head waters of Cuchillo Negro river. It is the center of a large mining district, and the headquarters of the stage line. The town site is in a large valley abundantly supplied with wood and water. From its central position, being the junction of all the roads that come into the Black Range, it is likely to be the town of that district. Mills and smelters will also be erected here.

The Black Range is fast drawing the attention of capital from the East, and many sales will shortly be made. We make no mistake in ranking it as one of the best and richest mining camps in New Mexico.

Prospecting Copper Mines. — Extensive copper leads have been known to exist in the Pueblo mountains, in the northwestern part of the county, for years. In early days, when the Indians were on the rampage, several prospectors were killed while hunting mines in that section, and for years afterwards little was done there, except to locate some copper mines, which cropped out at various places in the range. Recently J. C. Wear, who procured a United States patent for some of these mines, seven or eight years ago, has been making a move to develop them. He has tested the ore and found that it contains a high percentage of metal, and he is now putting men to work on the property with a view of putting up furnaces when the developments warrant the outlay.—*Silver State.*

Good Gold Mines.—Gold bearing quartz, which promises to pay handsomely, has been discovered by Samuel Crandall and John Beach in New York canyon, near Derby's ranch, in the northwestern part of the county. They took nine tons of the quartz to Bartlett Creek and worked it in a mill at that place. The result was highly satisfactory, the ore having produced $900, or $100 per ton, which was brought here by Mr. Crandall and shipped to San Francisco.—*Silver State.*

Treating Complex Ores in Europe.

The following communication from Mr. Charles W. Bryant, of the Deer Isle mining company, addressed to the *Maine Mining Journal*, is valuable:

It is known to the readers of the *Journal* and many gentlemen who are interested in Maine, that I have recently returned from Europe, where I obtained some information in regard to the treatment there of ores similar to the varieties which are found and being mined in this State. Some of the general details and results of my observations will, I think, be not only interesting to people here, but will, I trust, tend to do away with the feeling prevalent that Maine ores cannot be profitably treated.

The process by which complex ores are being treated at Swansea, at one establishment where about 250 tons per week are worked is as follows:

1. The ore is ground to a coarse powder.

2. The ore is then calcined in muffled furnaces at a moderate heat, to drive off the sulphur, the sulphurous fumes being collected in leaden chambers and towers for the manufacture of sulphuric acid in the usual way.

3. The ore is then placed in a revolving pan (somewhat similar to the mortar mill) containing sulphuric acid diluted with hot water. The diluted sulphuric acid at once takes into solution nearly all the zinc and copper, leaving all the lead and silver undissolved in the ore. The latter is now in a suitable condition for smelting in the usual manner in cupolas or reverberatory furnaces.

4. The solution of zinc and copper is then drawn off into tanks, where any fine particles of the ore settle as a mud, which latter contain lead and silver (being in fact the finer portions of the ore) and is suitable for smelting as above.

5. The copper in solution is then precipitated in the customary way, by iron, forming a copper precipitate, at once suitable for the copper smelters.

6. The remaining liquor, which contains the sulphate of zinc, is then drawn off into pans, and evaporated until it becomes a thick mud, when a certain quantity of raw or uncalcined blende (zinc ore) is added. The desiccation is carried still further until a dry mixture is obtained of sulphate of zinc and raw blende. The blende is added to decompose the sulphate of zinc in the next operation.

7. The mixture is placed in close ovens and there heated to redness. The sulphate of zinc is disengaged (derived from the sulphate of zinc and added blende) and conveyed to leaden chambers for production of sulphuric acid, while the zinc remains in the state of oxide, suited for the production of metallic zinc in the usual manner.

Thus, from this brief description it will be seen that all the metals contained in the ore are utilized, and that the agent used for the purpose (viz., sulphuric acid) is obtained from the ore itself.

The Plumas-Eureka Property.

From a letter in the *Mountain Messenger*, describing the famous Plumas-Eureka mine, we take the following: The mine is located near Jamison creek on the top of a mountain, some 3,000 ft. from or above the creek. The mine is one of the best timbered quartz mines I have seen in the State. The tunnel is 3,400 ft. long. The quartz is drawn out in large iron cars by mules, each car contains 1½ tons of quartz, and five cars are taken out each trip. The lode is from 4 to 20 ft. wide. At the mouth of the tunnel is a large steam hoiler, the steam is forced in through iron pipe, driving two engines in the mine, used for hoisting ore. There is no waste rock, everything is crushed. Their mills are run by water power. A lake is located on the top of the mountain, from which the water is obtained. The company built a new 60 stamp mill, near Johntown, at the foot of the mountain. A tunnel is now running from this mill to the lode, and will tap the lode at least 1,000 ft. lower than it ever has been worked before. The new mill is a model of workmanship, it has 60 stamps, 3 ore breakers, self-feeders, 24 pans and all modern improvements for saving gold. All the machinery is run by a turbine wheel. The mill is managed by a very few men. The company own their own sawmill and sell considerable lumber. At their machine shop nearly everything that can be made for the mine is manufactured here. Their car wheels and rails are all steel, and come from England, and are laid down in San Francisco much cheaper than our own manufacturers would sell them at. Their steel rails only cost a fraction over 3 cts., laid down in San Francisco, duty paid. Thirty arastras are run on sand or tailings that come from the mill, these are run by water power. They are owned by three Italian companies, who pay monthly rent to the Plumas-Eureka Mill company.

Science and Mining.—Prof. E. D. Cope, the celebrated naturalist, owns considerable mining property in New Mexico, and has just been paying a visit to that Territory. Prof. Alexander Agassiz, the eminent scientist, who is President of the Calumet and Hecla Co., is about to visit New Mexico to look after copper mines there, and will make a thorough investigation.

The new 20-stamp mill at the Rising Sun mine at Colfax is completed and put in operation, and everything is running satisfactorily.

Mines of Peru.

The following account, given by Hon. Chas. Adams, United States Minister to Bolivia, of a recent tour of inspection made by him of the silver mines of Bolivia, will be of interest. He says:

The principal mines worked in Bolivia to-day are those of Potosi, which, since the time of the Spaniards, have produced some $3,000,000,000 in silver, and are worked to-day, although in a very primitive manner, without machinery or smelting appliances, to a good profit. The Potosi mines are all located upon one mountain, which is almost cylindrical in shape. The seams and veins of ore cross each other and run through the mountain in almost every direction, and are found in every variety of shape and form. They are different in width as they vary in richness. Originally, too, veracious history tells us, the outcroppings consisted of pure silver, which was quarried and shipped to Spain. That there was some foundation of truth in this is, I think, proved by the quantities of square pieces of natural quarried silver taken from the veins still preserved in the cathedral of Sucre. These pieces I have seen and examined, and therefore know that such veins must have existed, though whether they are not all worked out remains an open question. In appearance the Potosi looks like a huge beehive, so seamed and covered over is it with a perfect honeycomb—I can use no other word for it—of tunnels and shafts. So much is this the case that it is almost, if not absolutely, impossible to travel around it on horseback. Even to-day quite a large number of the inhabitants of the city of Potosi have their own little gopher holes. Into these, they, so to speak, whenever they are in want of money, burrow and take out a sack or two or three or four of decomposed ore, which they heat up with rocks and work in the nearest rivulet for silver, as we do here for gold. Some of the mines are worked by companies. Of these there are four or five. The work is done mainly by tunneling and drifting. As a rule, even these mines are only worked for a few months in the year. As a whole, I should think that for at least one-third of the year they lie idle.

How they Work the Ores.

The ore is worked in much the same manner as it is with us, by stamp mills run by water power, but much more frequently in arastras. After crushing the ore is washed, desulphurized, and after that process thrown into large copper kettles, each of which holds about one ton. Water and quicksilver are then mixed with the mass, which is beaten with sticks by a number of men—six, if I remember, is a full complement—who stand around the big copper kettle, which is hung suspended over a fire. The beating is continued for about 12 hours, until the silver is amalgamated, when the charge is turned out and the kettles again filled, and the same process repeated. However primitive this system may appear to those of us who have seen the perfection to which mining is carried on in this country, it appears to possess the one great essential, that of thoroughly separating the pure silver from the base metal. In fact, the average per cent. saved by this simple process of separation is about 50%.

How the Miners Make it Pay.

Mr. Adams thus describes the manner in which the peons steal the rich ore from the mines in Caluechaca, probably the richest in the world, and by this means manage to keep 30 small smelters running when the mines are in operation:

The peons are not only searched, but stripped every night before leaving the works, so that it is impossible for them to pack off the ore in lumps. The most common way of committing these thefts is to grind the ore into powder while they are in the mines, and throw the powder over their clothing and underclothing. Some of them wear knitted stockings and drawers, and the amount of ore that will stick to these is hardly to be believed. After resuming their clothes at the works, they, on arriving at home, just throw the clothes laden with the dust into a bucket of water, when the dust, being loose, sinks to the bottom and forms a sediment. This sediment is to a very large percentage composed of silver. Another favorite method with some of the more cunning is to take a piece of the gangue rock, hollow it out, and fill it with dust that perhaps has 75% to 80% of silver in it, and plug the rock up and wheel it out with the rest of the gangue rock, and put it then just where they can get it as soon as they leave the works. A favorite method I learned was to hollow out a pick handle and fill that with powdered ore, while some have been known to be so cunning as to have made impromptu suppositories out of the powdered ore and carried it off in this manner.

The demand for miners, says the Salt Lake *Tribune*, is becoming quite active in nearly all the mining districts of Utah. The rise in the price of lead is causing many dormant properties to start up, and will materially increase the product of the Territory.

The most encouraging reports still arrive from the various mining camps in Calico, Grapevine and Alvord districts, San Bernardino. It is asserted that a mill will shortly be erected in the latter district by San Francisco capitalists.

How they Salt a Claim.

"I wish you would explain to me all about this salting of claims that I hear so much about," said a meek-eyed tender-foot to a grizzly old miner who was panning about six ounces of pulverized quartz.

"I don't see what they want to salt a claim for, and I don't understand how they do it."

"Well, you see, a hot season like this they have to salt a claim lots of times to keep it. A fresh claim is good enough for a fresh tender-foot, but the old-timers won't look at anything but a pickled claim. You know what quartz is, probably?"

"No."

"Well, every claim has quartz. Some more and some less. You find out how many quartz there are, and then put in so many pounds of salt to the quart. Wild cat claims require more salt, because the wild cat spoils quicker than anything else.

"Sometimes you catch a sucker, too, and you have to put him in brine pretty plenty or you will lose him. That's one reason why they salt a claim.

"Then, again, you often grub stake a man——"

"But what is grub stake?"

"Well, a grub stake is a stake that the boys hang their grub on so they can carry it. Lots of mining men have been knocked cold by a blow from a grub stake.

"What I wanted to say, though, was this: You will probably at first strike free-milling poverty, with indications of something else. Then you will no doubt sink till you strike hard-rock, or a true fissure gopher hole, with traces of disappointment.

"That's the time to put in your salt. You can shoot it into the shaft with a double-barrelled shot-gun, or wet it and apply it with a whitewash brush. If people turn up their noses at your claim then, and say it is a snide, and that they think there is something rotten in Denmark, you can tell them that they are clear off, and that you have salted your claim, and that you know it is all right."

The last seen of the tenderfoot he was buying a double-barreled shot-gun and 10 lbs. of rock salt.

There's no doubt but a mining camp is the place to send a young man who wants to acquire knowledge and fill his system full of information that will be useful to him as long as he lives.

Silver Reef, Utah.

Recent events warrant us in repeating that the future of Silver Reef was never so full of promise as at present, and it is encouraging to note that those most enthusiastic in foreshadowing the destiny of the camp are the men whose long residence in the district and thorough acquaintance with its resources place their opinions high above the value of ordinary speculations. Silver Reef is in no sense a mushroom camp. It is not supported by money brought in by outsiders. It stands and will continue to stand upon its own solid merits, and is in no need of a stampede to sustain life. In other words, there is nothing Woodriverish about the district. It is a camp whose mines are their own advertisement. They are growing richer and larger with every stroke of the pick, and upon this fact alone do we depend to attract the capital now lying idle awaiting opportunities for investment. The general distrust as to the permanence of ore veins in sandstone has altogether disappeared and it is now conceded that our small surface development has proved far less profitable than future operations will become as greater depth is obtained. Let capital and muscle be brought to operate with system and energy along the line of our great lodes, let the vast area of virgin ground awaiting the magic influence of industry and cash, be made to bring forth its treasures. Legitimate mining is not more uncertain of success than merchandising or manufacturing, and where the rock is sandstone and the mines as easily developed as they are in this district under proper management, the careful investment of capital is absolutely safe.—*Silver Reef Miner.*

Grand Prize.—At the annual meeting of the Grand Prize mine last week, the Secretary submitted a report, which showed a total of receipts and expenditures of $308,445. Of the receipts, $83,600 were from assessments; $15,922 from bullion; and $13,000 from crushing ore. The sum of $28,848 was derived from sale of stock, machinery, rent of mill, hoisting, etc. In the expenditures, the sum of $87,403 was spent for mine labor; $19,046 for mill labor; $94,637 for mine supplies; and $33,056 for mill supplies. The discount on bullion was $22,872. The election for Directors and officers resulted as follows: J. L. Brown, Jno. E. Dixon, Thomas Cole, Thomas Whitely, E. M. Hall. President, J. L. Brown; Vice-President, Jno. E. Dixon; Secretary, E. M. Hall.

William A. Farish has been appointed Superintendent and General Manager in charge of the State Line mines, Gold Mountain, Nev. Mr. Farish, who is now in New York, will be remembered in connection with the Homestake and Black Bear mining companies.

Mohawk is to be the name of the new mining town in Safford district.

The Engineer.

Advantages of Electric Railways.

In an extended account of the construction and working of the Siemens electric railway at Berlin, the London *Times* mentions as first among the advantages which the electric motor has over steam or compressed air for passenger transport, the circumstance that no heavy machinery has to be carried about to set the train in motion. The carriages can therefore be built in a lighter manner, thus reducing the power necessary to move them, and permitting all bridges and superstructures to be built more cheaply than usual. Several carriages, each with a dynamo machine, can be joined to one train, and by this distribution of motive power much steeper inclines can be overcome than when the same train is drawn by a single locomotive. In addition to the ordinary brakes, means can be provided to short-circuit the machines on the carriages and to cause them to act as very powerful brakes. The use of large stationary engines reduces the amount of fuel necessary to develop a certain power on the traveling carriage, and if waterfalls can be utilized the cost of working these railways can be further diminished. It seems probable that such railways can be usefully and economically constructed to facilitate the traffic in crowded streets, or in situations where local circumstances favor their application. From all that has been done during the last few years it is evident that the art of transmitting power by electricity has advanced rapidly, and that its practical application is continually gaining ground.

New Discovery in Marine Architecture. Mention has already been made of a new discovery in marine architecture by Prof. Raoul Pictet of Geneva, who is now constructing a small steamer for a working model. Prof. Pictet expects that a vessel built on the principle which he has devised will draw less and less water as her speed increases, thus gliding over the water instead of pushing through it. The model which he is now building will be 52½ ft. long and 11½ ft. broad. She is expected to draw 13 inches fore and 18 inches aft while lying at anchor, and two-fifths of an inch fore and 6½ inches aft when going at full speed. The engine will be placed amidships, from which point to the stern the screwshaft and the keel form an inclined plane; the bows are long, tapering and wedge-shaped. The inventor expects to effect a great saving of fuel, believing that a steamer built on this plan can be kept at full speed with one-third the expenditure of force with which it started. The trial trip will be made on Lake Geneva next November, and the model is expected to reach a speed of 40 miles an hour. The Geneva correspondent of the London *Times*, who furnishes the above description, writes that Prof. Pictet's previous scientific achievements have been so remarkable that many people who cannot follow his reasoning have no hesitation in accepting his conclusions.

The *Livadia*, from which so much was expected, and which gave such promising results at first, is, it seems, greatly disappointing its projectors, and the present Czar is having a lamentable experience with the great "turtle-back" yacht, built for his father in England in accordance with specifications which defied all established rules and precedents, and gorgeously equipped for the royal pleasure. A dispatch from Odessa to the London *Times* says: "It is reported that the commission appointed to examine the qualities of the Russian imperial yacht *Livadia*, has come to the conclusion that she does not satisfactorily answer the requirements of a sea-going vessel, either in a nautical or a mechanical sense, as she rolls too much, is too slow, too weakly built, and the materials used in her construction are of inferior quality. It is, therefore, suggested to take the yacht to pieces and build a gunboat and three cruisers out of the materials, and use the fittings and furniture for a third yacht to be built on the lines of the original *Livadia*." We have never heard that the formidable French ram *Dunderberg*, built in America by Wm. H. Webb, of New York, was "weakly built," or deficient either in "a nautical or a mechanical sense."

The Mississippi Jetties.—Conflicting accounts reach us in regard to the working of the Mississippi jetties. At one time, reports come that they are more than meeting the most sanguine expectations; then again, accounts like the following are sent out: It is not unlikely, judging by some reports, that Capt. Eads will be called upon by Congress at its next session to explain the condition of the jetty system at the mouth of the Mississippi river. The Government has now expended upwards of $5,000,000 upon it. Two years ago Capt Eads drew a large sum of money from the public treasury on the strength of his statement that the ship channel was 600 ft. wide and 30 ft. deep. Last month an English steamer dragged the bottom of the channel for 150 to 200 yards, while drawing only 23 ft. of water. Four captains of as many different crafts also certify that instead of the channel being 600 ft. in width, it is apparently not more than 150 ft. wide, and that they believe that just above Cram island two vessels drawing 23 ft. of water could not pass each other without liability to grounding.

Useful Information.

Magnets for Dressing Ores.

The *Engineering and Mining Journal* is of the opinion that the indications are multiplying that magnets will in the future occupy a more prominent position in the dressing of ores, and it seems that some of the most troublesome ore mixtures that have heretofore baffled the skill of the mining engineer will become tractable with their aid. There is nothing new in this proposition to take advantage of the fact that one mineral is attracted by the magnet, while another that is associated with it is not, to separate them. The same paper says that at Traversalla the method was used at an early date, and it has since been tried at Przibram and other places. But it is really only since the perfection of dynamo-electric machines that this promising field has been fairly opened. The use of light, powerful electro-magnets in the place of ponderous permanent magnets has increased the capacity of such machines, and made them practical. It would of course be idle to expect any magnetic dressing apparatus to do what Edison at one time claimed it to be able to accomplish in working tailings; and a study of the plans recently brought forward by Siemens, and the apparatus now used at the Friedrichsegen mine, Prussia, will be sufficient to convince an engineer that the "great wizard," late of Menlo Park, New Jersey, has not kept abreast of the time. The Siemens separator consists of a series of rings, made magnetic by the current from a dynamo-electric machine, and so arranged that one end of the drum, where the ore is first delivered, has less power, which increases as the material is carried toward the delivery. The Friedrichsegen apparatus, which is now used for separating blende and spathic iron ore after it has been roasted, has a number of fixed electro-magnets massed near the point where the ore is fed. The material falls upon a rotating copper drum, within which these electro-magnets are, and the adhering particles of iron ore carried along by the drum, while the blende glides by the magnets. A judicious system of roasting, if necessary, and separation by magnetism, will probably prove a valuable aid in the treatment of such ores like intimate mixtures of blende and pyrites, or some of our New Jersey zinc ores.

Burning Gold into China.—To dissolve gold for gilding china or glass that has to be burnt: Triturate gold leaf in a mortar with a little honey until reduced very fine; then dissolve out the honey with hot water, and mix the gold dust with a little gum water for use; or dissolve the gold in hot aqua regia, evaporate to dryness in a porcelain dish over a hot water bath, and dissolve in ether for use.

A Simple Method for Obtaining Ozone.—Put a few sticks of clean phosphorus in a basin of water, half cover them with fresh cold water (soft), and put a closed bell jar or inverted glass vessel (clean) of any kind over all so as to confine the air above the phosphorus. In the course of an hour the air thus confined will be found charged with ozone.

A Brilliant Black is produced on iron and steel by applying, with a fine hair brush, a mixture of turpentine and sulphur boiled together. When the turpentine evaporates there remains on the metal a thin layer of sulphur, which unites closely with the iron when heated for a time over a spirit or gas flame. This varnish protects the metal perfectly, and is quite durable.

To Harden Steel take two teaspoonfuls of water, one-half teaspoonful of flour, and one of salt. Heat the steel enough to coat it with the paste by immersing it in the composition; after which heat it to a cherry red and plunge it into soft water. If properly done, the steel will come out with a beautiful white surface. Strike files are said to be hardened in this manner.

To Keep Machinery from Rusting take one-half ounce of camphor, dissolve in one pound of melted lard; take off the scum and mix in as much fine black lead as will give it an iron color. Clean the machinery and smear with this mixture. After 24 hours rub clean with a soft linen cloth. It will keep clean for months under ordinary circumstances.

A Recent Drill Press made by an English firm has the column carrying the platen at one side of the frame, so that the platen can be swung out entirely clear of the frame, leaving nothing between it and the work, which is bolted on the main bed-plate under the platen. This is of cast iron, planed true, and must be a great convenience in drilling cylinder flanges, etc.

English Steel Castings by some firms are made from old files in connection with other material, and are said to be sound and very strong. It is said that the excess of carbon in such stock is found no disadvantage.

To Remove Ink-Stains or to Bleach Wood. Oxalic acid dissolved in warm water and applied to the parts stained will remove the stain, or bleach wood that is too dark to match any other part.

The "White House" Wash.

A correspondent in the *Scientific American* says: "I have noticed in several answers to correspondents and in at least one article in your valued paper an allusion to what they call the whitewash on the White House. As I know something of that preparation I think it proper that I inform you and your many readers. About the year 1836, John Ogden Dey, Esq., an unternal uncle of mine, visited Washington. He was a man of very observant habits, and, in his inspection of the White House and the old Capitol building (the central part of the Capitol as it now stands), he found that the stone of which it was erected was being acted on severely by the weather. The outside of the stones had splintered by exposure and contraction and the disintegrating effect of the atmosphere to such an extent as to seriously threaten its permanency. He sought the Committee on Public Buildings and proposed to remedy the evil, not with stucco, but with a cement wash. After a full interchange of opinion, he was empowered to send the material and instructions to Washington, which he did; and it was put on the next year, and has stayed there ever since, protecting the building material effectually. The information was given without fee or reward.

"The old man has passed away long since, and, in justice to his memory, as well as to inform the public, I have penned this. The material used was "Onondaga Hydraulic Cement," from the State of New York, mixed with a small amount of glue and with milk; the exact proportions I do not now remember. I have seen several brick houses covered with this cement that have stood all kinds of weather for years. Some I have in mind were washed 35 years ago, and still retain the full coat and look as well as when put on. The cement has to be applied soon after it is mixed, and put on as thick as the brush will carry it. Sometimes two or more coats are required."

New Use for Petroleum.—In the town of Beku, in the Russian petroleum district, the crude oil is worth but six cents a barrel and the authorities use it for "watering" the streets in preference to sea water, though the latter costs only the hauling. The oil in combination with the sandy soil makes a solid and compact pavement which lasts for many days. Nothing is said about the prevailing odor in Beku.

Good Health.

A Study of Children's Teeth.

For two or three years Dr. Samuel Sexton has been engaged in an investigation of the teeth of school-children with special reference to the influence of decayed teeth upon the sight and hearing of children so afflicted. The investigation was suggested by the almost constant occurrence of defective teeth in cases of inflammatory diseases of the eye and ear.

In the course of his work, the *Times* states, Dr. Sexton has taken some hundreds of accurate casts, in plaster, of the interior of the mouth in cases that have come under his notice, and has collected a cabinet that is invaluable as a contribution to science. His method has been, first, to take a complete cast of the internal cavity, and then from it to mould each jaw separately, and unite the two posteriorly with a neat brass hinge, so that the state of the teeth, their arrangement, and all their peculiarities can be observed at a glance. He has found a pretty constant association between impaired hearing and defective teeth, the cause of which he believes to lie in the distribution of the fifth pair of nerves, which is at once a sensory, motor and trophic pair, supplying the teeth, the tissues of the nose, those of the eye and ear, the integuments of the frontal and temporal region, and so on. Irritation of the whole region is consequently produced by a defective tooth, and, in point of fact, some of the severest cases of neuralgia, temporal, facial and ophthalmic, arise from impaired teeth; often in cases where the teeth themselves give no trouble whatever, and none save the acutest medical intelligence can trace any relation between the fierce attacks in the eye, ear or temple, perhaps, and the carried tooth that gives no local trouble whatever. In a few cases progressive dementia has been arrested by immediate repair of a tooth that produced no apparent disturbance, but was responsible for deep-seated cerebral trouble; but these cases have been too few to lay stress upon as factors in the investigation. On the other hand, troubles with the eye and ear are often traceable to defective teeth, and Dr. Sexton regards irritation of the maxillary limbs of the fifth pair as among the principal causes of the progressive near-sightedness of school children, as observed by Drs. Agnew, Loring, Parke Lewis, Roha and other ophthalmologists.

A New Way of Coloring the Hair.—Dr. D. W. Prentiss, of Washington, reports to the Smithsonian Institute that he recently gave a little girl of that city jaborandi, a Brazilian plant, as a cure for blood poisoning. He was much surprised to find that her hair, which was at first a light blonde, soon began to turn dark, and watched with much interest the darkening process for four months, when it was almost black. He believes that the change was due to the medicine which he administered during that time for the child's blood.

The Hygiene of Old Age.

At no period of life is a careful observance of the laws of health of so imperious importance as in advanced age. The vital machinery is worn and weakened, the vitality at low ebb, and it is of paramount importance that all unnecessary hindrances should be removed, that every removable obstacle to the healthy performance of the bodily functions should be taken out of the way. Thousands of lives are annually sacrificed through the mistaken idea that hygienic rules which are acknowledged to apply to young persons and adults are not to be observed by those in advanced age. For example, many popular writers maintain that while the use of wine as a beverage by youth and adults cannot be condemned too strongly, it is necessary for the aged, as a means of stimulating the declining forces.

Another writer condemns bathing by the aged because, it is claimed, it uses up the animal heat.

The error of the first theory is apparent when the fact is recalled that stimulating lessens, instead of reinforcing, vital strength, thus weakening the hold on life and shortening its duration. The fallacy of the second theory is equally apparent when we take into consideration the fact that in old age the wastes of the body are greatly increased. The discharges from all the outlets of the body are more heavily laden with organic impurities than during youth and adult age. The breath is laden with the poisonous products of disintegration, and the perspiration with effete matter. It is for this reason that a sudden obstruction of any of these outlets is so speedily followed by fatal results. If frequent bathing is neglected, the skin becomes obstructed and the kidneys are overworked. The urine becomes irritating in character, and inflammation or congestion of the bladder is likely to be the result. We have met scores of cases of irritable bladder in elderly men which could be traced, in a great part, at least, to the neglect of the bath.

Old persons should recollect, also, that the bath is for them particularly necessary as a sanitary measure. As the waste of the body propoundsrates over the repair, the skin, if unwashed, soon becomes covered with a film of the most intensely poisonous and readily decomposable matter. A few days' accumulation is enough to produce a condition not only in the highest degree detrimental to the individual himself, but offensively injurious to all persons of acute olfactory sensibilities who may be closely associated with him.

It is true that cold bathing may be, and generally is, in a high degree injurious to aged persons; but bathing in water at or near the temperature of the body cannot be more productive of harm than putting on a clean suit of clothes. Cleanliness is enforced by one of the first laws in the "code of health," and is binding at all times, and at all ages. The greatest enemy of health is dirt; and the worst of all kinds of dirt is that which arises from the destructive processes at work in the body.—*Good Health.*

Danger from Dust.

A probably serious source of disease is the dust of cities. When we reflect that this is the dried and pulverized dirt and filth of our streets, derived from all kinds of refuse matter, its dangerous qualities may be suspected if they are not clearly obvious. Conveyed by the winds, it is diffused everywhere, and settles upon or adheres to everything. We inhale it, drink it, and eat it with our food. A speck of mud on our bread excites disgust; but who minds the same thing when it is nothing but a little dust? If our food just brought from the market or the provision store is examined with the microscope, it is found to teem with small particles of dust, consisting of fine sand, bits of hay and straw, filaments of cotton from old paper and rags, wood fibres, hairs and scurf scales of man and beast, starch grains, spores, etc. Recent investigations render it probable that dust contains the germs of decomposition, gangrene, and contagious diseases.

While our view of the dangerous qualities of dust may be exaggerated, there is certainly sufficient reason to regard it with apprehension, and make it desirable to avoid it. Its subtle and all-pervading character renders this, to a great extent, impossible, but it may be much reduced by the removal of its sources of supply—the accumulation of dirt and filth. For this reason the streets should be kept clean, by sweeping and washing; and, to facilitate this, they should be as smoothly paved as will be consistent with safe walking and driving. Especially is this desirable in the vicinity of the depots of our provisions, the market houses, where, unfortunately, we often observe the greatest accumulation of dirt. The streets around our markets should have an asphaltum or other smooth pavement, and it should be swept and washed weekly, or oftener.—*American Journal of Microscopy.*

Bone Felon.—The London *Lancet* gives the following recipe for the cure of this most excruciatingly painful affliction: As soon as the disease is felt, put on directly over the spot a fly-blister, about the size of your thumb nail. Let it remain for six hours, at the expiration of which time, directly under the surface of the blister, may be seen the felon, which can be instantly taken out with the point of a needle or a lancet.

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Passing Events.

For the past few days the obsequiee of the President have occupied the public mind so greatly, that our mining news is unusually meager Nevertheless, from various quartere come notes of encouragement and progress. Several very rich strikes are reported.

The most important newe of any, however, to California miners, is that the "Drainage Act" haa heen declared unconetitutional. This matter is referred to more fully elsewhere in this issue.

The week has been filled with mourning and the heart of the people has overflowed with sadness. It is remarked that such universal and unfeigned grief at the death of a ruler, is not within the memory of any one. There have good and great men died before, and died too at the hand of violence, calculated to excite the fullest indignation and sympathy. But none has died so profoundly mourned. The truth of the matter is that not for a generation perhaps has our people been so closely united in heart, sympathy and aspiration. The old issuee were long since hnried, and the animosities they engendered have melted away in the warmth of the new and stronger union. Thue when the assasein lifted his hand at the President, he struck at the whole people, and there ie hut a eingle sentiment of hereavement pervading the nation.

The public demonstrations at tho obsequies of the late President were greater than have ever been known before. On Monday, at Clevsland, Ohio, where the intsrment took place, there was every possible token of respect, esteem and remembrance. At the sams hour, from end to end of the country, memorial services wers held. In San Francisco, the procession of military and civic societies was two and ons-half honrs passing a point, and appropriats services were held in the great pavilion of the Mechanics' Institute, which only a fraction of ths great multitude could enter. Everything has tended to maks ths incidents of ths past three months doubly impressive upon the minds of ths people, and their lessons will not soon he forgotten.

Quartz Mining About Hornitos, Mariposa County.

Hornitos, one of the oldest mining camps in Mariposa county, shows signs of returning activity. Many old quartz claims are heing prospected again and new locations are heing made. Tbe Duncan quartz mine a mile southeast of the town has heen bought hy San Francisco parties who are putting up a 10-stamp mill on the propsrty. The mine has only bsen worked a few feet below the water lsvcl and so far has proved very rich. Rich developments ars expected as soon as sinking is resumed. The Washington mine is taking out considerable rich ore, hnt running its mill on short time owing to lack of water. The absence of watcr is the weak point of the district; none of the mines within 10 miles of Hornitos, with the exception of tbe Duncan, having watsr enough, even hy using the supply over several times to feed the boilers and batteries. The Eureka mine, originally Qnartz Mountain, is also heing developed. This mine has one of the largest ore hodies of any mins in California, the croppings showing a width of 300 ft. for a distance of 1,000 ft. A new shaft 60 ft. deep has heen sunk on the east wall and work is at present being done on a crosscut to determiue the sxtent of the ore body. Assays made of the rock (croppings) range from $90 in the hest streaks down to an average of from $4 to $10 in the poorer. The owners have had sn engineering party locating a 10-mile line of railroad from the mine to a mill site on the Merced river. The road is estimated to cost about $80,000 equipped. The construction of this road and 100-stamp mill, promised next spring, will give a great impetus to quartz mining in the vicinity, in fact, is its only chance.

Canada Hill Mining District, Placer County.

Reed's hydranlic mine, the longest worked in the district, is heing refitted for hydraulicing the coming spring. Another old claim, the Wiley, has heen extensively worked during the last few years and has paid well. On Hill's mine a bedrock tunnel hae heen run 400 ft. toward an unprospected part of the channel. The Oriental company have ennk a prospect shaft in the cement 80 ft. to hed-rock and drift ing from it found ground warranting the running of a hedrock tunnel next season. Several new locations on which more or less work has heen done have heen made this summer and nearly every foot of possibly valuable ground has heen taken up.

All of these mines are on what is known as the Canada hill channel which is at an elevation of about 7,000 ft. and contrary to the ordinary course of the huried river chaunels of the Sierras, rnne from west to east. The gold is a coarse quartz gold very little washed and often connected with ite original qnartz matrix. The eources from which thie quartz comee are evidently ledges in the immediate vicinity. Several of these ledges have heen prospected and yield well. More thorough prospecting and a little energetic work propsrly hacked up with capital will, heyond question, establish a paying quartz dietrict.

Lower down on the Divide at the Secret House the Greek claim is heing fitted up for extensive drifting. Buildings, gravel chutes, car tracks and sluicee are in course of construction. The hedrock tunnel has developed a large channel and extensive deposit of pay gravel. The Hogs Back and New Basel mines, owing to litigation, are not heing worked at present.

FAITH.—A miner named Piantone hae just made a rich strike in Eureka district, having found a splendid body of high grade ore in the "Deadhroke mine," on Prospect mountain. The *Sentinel* says: "No man is hetter deserving of the greateet euccess. Mr. Piantone has always heen imhued with the etrongest faith in the value of Prospect mountain mines and has demonstrated this faith hy his works. He has heen sticking to the old mountain for the past eight years. He discovered and developed the Matamoras mine for which he received $50,000. He now thinks that the Deadhroke is even more valuahle than the Matamoras."

J. E. TIFFON, of Redding, Shasta county, exhibited at the State fair a tire upsetter of novel construction and design, hut which proved itself capahle of performing ite work in a very satiefactory manner.

On Some Problems Arising in the Assay Office.

[Written for the MINING AND SCIENTIFIC PRESS hy C. H. AARON.]

To Find the Weight of Gold in a Specimen of Gold in Quartz, etc.

The rules for this operation, as given in most hooks, involve a great deal of work, and are snch as no one hut a Chinaman can vsnture to trust his memory with. I bave therefore trisd to find a method which, if not simpler, will at least involvs the use of fewer figures and he more easily remembered. Of ths following nine rules, some appear to fulfil these conditions.

Rule 1st. From the product of ths specific gravity of the specimen multiplisd by the specific gravity of the gold, snhtract the product of the specific gravity of the qnartz multiplied hy the specific gravity of the gold. The rsmainder divide hy the difference hetween the specific gravity of the gold and that of the quartz. The result will hs the parts of gold in as many parts of the specimen as equal the specific gravity of the specimen. Example: A specimen weighs 32 ozs., its specific gravity is 8. Taking the specific gravity of gold equals 19, and that of quartz equals 2.6 then

$$8\times19=152$$
$$2.6\times19=49.4$$

$19-2.6=16.4$ | 102.6 | $=6.256$ ozs.

of gold in 8 ozs. of the specimen, and 8:6.256 ::32:25.024 ozs. of gold in the specimsn. In this case, as $8=\frac{1}{4}$ of 32, it is only nscessary to multiply 6.256 by 4. Assuming the specifio gravity of gold and gangue as ahove, the rule may he stated thus: Multiply specific gravity of specimen hy 19; subtract 49.4 and divide the remainder hy 16.4. The qnotient is ths nnmher of parts of gold in as many parts of the specimen as equal specific gravity of specimen. The constants can he altsred to suit any given specific gravity of metal and of gangue, and a note of thsm kept at hand rsady for nse.

Rule 2d. From tho product of spscific gravity of specimen into specific gravity of gold, subtract the prodnct of specific gravity of specimen into specific gravity of quartz for a divisor, and from the same subtract the product of specific gravity of quartz into specific gravity of gold for a dividend. Divide, and multiply the quotient by the weight of the specimen. The product will bs the weight of ths gold in the specimsn.

Example, same as before:

$8\times19=152$ $\qquad$ $152.$
$8\times2.6=20.8$ $\qquad$ $19\times2.6=49.4.$

Divisor, 131.2; Dividend, 102.6; Quotisnt, 0.782, which, multiplied hy 32=25.02 oz. of gold in the specimen.

Rnle 3d. Subtract specific gravity of specimen from specific gravity of gold; the remainder call volume ratio of quartz.

Substract epecific gravity of quartz from epecific gravity of specimen; the remainder call volume ratio of gold. Multiply volume ratio of quartz hy specific gravity of quartz, the product is the weight ratio of the qnartz; multiply volume ratio of gold hy specific gravity of gold, the product is tbe weight ratio of the gold. The sum of these is the corresponding weight ratio of the specimen.

Divide the actual weigbt of tbe specimen, hy proportion, in the ratio found.

Example, the same.

$19-8=11=$volume ratio quartz.
$8-2.6=5.4=$ " " gold.
$11\times2.6=28.6=$ weight ratio quartz.
$5.4\times19=102.6=$ " " gold.
$102.6+28.6=131.2=$ " " epecimen.

and 131.2:102.6::32:25.024 ozs. of gold in the epecimen.

Rule 4th. From specific gravity of gold × specific gravity of specimen subtract epecific gravity of gold × specific gravity of qnartz, and from the latter subtract specific gravity of quartz × specific gravity of specimen. The firet remainder is the ratio weight of gold; the second is the ratio weight of quartz. Example, the same:

$19\times8=152$ $\qquad$ 49.4
$19\times2.6=49.4$ $\qquad$ $2.6\times8=20.8$

Ratio of gold .102.6 $\qquad$ Ratio of quartz .28.6

The rest of tho calculation is the same as in rule third.

The rule may he more easily remembered if stated thus: Proceed as in redncing to a common denominator the fractions representing the displacemeut of the substances in water, namely: $\frac{19}{1}$ $\frac{2.6}{1}$ $\frac{8}{1}$, so far as to obtain the new numeratore, the common denominator not heing required; then, from the greatest numerator subtract the next less, and from that the least. The first remainder is the ratio weigbt of the gold; the second that of the quartz. In this example the new numerators are: $\frac{20.8}{\cdots}$, $\frac{152}{\cdots}$ and $\frac{49.4}{\cdots}$, as found above.

Rule 5th. Divide any nnmher hy the specific gravity of the gold, the quartz, and the epecimen respectively. From the greater quotient subtract the next less, and from that the least. The firet remainder is the ratio weight of the gold in the epecimen. The second is that of the quartz. Any number will do for a dividend, hut the most convenient is the specific gravity of tho gold, giving 1 for tbe least quotient. Example, the same:

$19\div19=1$	$7.3-2.37=4.93=$ ratio of gold.
$19\div2.6=7.3$	$2.37-1=1.37=$ " quartz.
$19\div8=2.37$	

$6.30=$ " specimen.

tbsn 6.30:4.93::32:25.03 ozs. of gold in ths specimen; ths slight discrepancy in this result, as compared with the othsrs, is owing to not carrying the division of 19 to mors decimal placss.

Rule 6th. Multiply specific gravity of specimen hy the difference bstwesn specific gravity of gold and specific gravity of quartz. Also multiply specific gravity of gold hy ths differencs hetwsen specific gravity of specimsn and specific gravity of quartz. Divide the last product hy the first, and multiply hy ths weight of the specimen. The resnlt is the weight of gold in the specimen. Taking the same example:

$19-2.6=16.4$ | $8-2.6=5.4$
$16.4\times8=131.2$ | $5.4\times19=102.6$
$102.6\div131.2=0.782$
$0.782\times32=25.02$ ozs. of gold in the specimsn.

As, in any oass the specimsn must be weighed in air and in water, and as the specific gravity of tho mstal and ths gangue may vary considsrahly in different specimens, some lahor may hs saved, and the weight of any mstal or other substance in any gangue found hy procesdiug as follows:

Rule 7th. Weigh the specimen, a portion of the metal, and a portion of the gangue, each in air and in water. Divide the difference hetween the respective weights in air and in water hy ths weights in air. From the greater quotient subtract the next less, and from the latter the least. The first remainder is the weight ratio of the heavier substanes, ths second is that of the lighter. Examplo: A specimen of native silver in calc spar weighs 84 lbs. avoirdupois in air, aud 73.5 lbs. in water. A piecs of the silver weighs 27 (ozs., grains or anything) in air, and 24 in water. A pisce of the spar weighs 20 in air and 12 in water; thsn,

Spar in air 20
Spar in water 12

Dif. $8\div20=0.400$

Specimsn in air 84
Specimen in water 73.5

Dif. $10.5\div84=0.125$

Silver in air 27
Silver in water 24

Dif. $3\div27=0.111$ and

$400-125=275=$proportion of silver.
$125-111=14=$proportion of spar.

289 proportion of specimen.

289:275::84:79.93 lbs. of silver in specimens, and $79.93\times14.583=1165.62$ oz. Troy.

When a body is weighed in air and in watsr, the weight in air dividsd hy the difference is the specific gravity; the difference divided hy the weight is the *specific displacement*. The specific gravity represents the relative weights of equal volumes of the snbstance and of water, when that of the water is called 1. Tho specific dieplacement represents the relative weighte of equal volumes of the same when the weight of the substance is called 1. The specific displacement is the reciprocal of the specific gravity.

The fundsmental eqnation of our problem is generally given as $\frac{x}{a}+\frac{y}{b}=\frac{d}{o}$ in which x, y and d are the respective weights of gold, quartz and specimen, and a, b, c, are the specific gravities. Thie means that the water displaced by the gold, plus that dieplaced hy the quartz, is equal to that displaced hy the epecimen, whence specific displacement of x pins specific dieplacement of y equal epecifio displacement of specimen.

Now specific gravity of gold minus specific gravity of specimen, and specific gravity of epecimen minus specific gravity of quartz, are the relative *volumes* of gold and quartz, from which the relative weights can he deduced; hut specific displacement of quartz minus specific dieplacement of specimen, and epecific displacement of specimen minus specific displacement of gold, are the relative *weights* at once; and if the substances are weighed in air and in watsr, it is as easy to find the spscific displacement as the epecific gravity. Hence Rnle 7th. The specific displacement of any substance heavier than water is always less than nnity; consequently, when all of the eubstances are heavier than water, the decimal point may be dieregarded in that rule.

Or more readily:

$$.0526x+.3846y=4$$
$$.0526x+.0526y=1.682$$
$$.3320y=2.318$$

And $2.318\div.332=6.98$ oz. qnartz.

Then $.3846x+.3846y=12.307$
And $.0526x+.3846y=4.000$
$.3320x=8.307$

And $8.307\div.332=25.02$ oz. gold.

If the specific displacement of the gold or of the quartz he not determined experimentally, either can he got hy dividing 1 hy the assumed spscific gravity. Thus, in the example of the silver epecimen, the specific gravity of the spar is $20\div8=2.5$; the specific displacement is $8\div20=.4$; whicl is the same as $1\div2.5$; hence, when the specific gravity of each component and of the epscimen are given, the correspondiug specifio displacement for each may he found by dividing 1 hyeach specific gravity; hut the

proportional specific displacement can be got by dividing *any* number by each specific gravity; hence, Rule 5th.

Again:

Let x = weight of heavier substance, a its s. d.
y = " lighter " b its s. d.
c = " specimen, d its s. d.
or total displacement = difference of weight in air and water.

Then $x+y=c$
And $ax+by=d$

Whence I deduce the following:

Rule 8th: From the product of weight of specimen into specific displacement of lighter substance, subtract total displacement of specimen. From total displacement of specimen subtract the product of weight of specimen into specific displacement of heavier substance. Divide each remainder by the difference between specific displacement of lighter and specific displacement of heavier substance. The first quotient is the weight of the heavier, the second of the lighter substance in the specimen.

Taking our first example:

Specific displacement of quartz equal .3846; specific displacement of gold equal .0526; total displacement of specimen equal 4; weight equal 32.

$.3846 \times 32 = 12.307$
$12.307 - 4 = 8.307$ first remainder
$8.307 \div .332 = 25.02$ oz. gold
And $4 - 1.683 = 2.317$ second remainder
$2.317 \div .332 = 6.98$ oz. quartz

And again, if the specific gravity of the components be given, or assumed, it is not necessary to change anything, nor to obtain specific gravity of the specimen; for, let specific gravity of gold $= a$; specific gravity of quartz $= b$; weight of specimen $= c$; and its difference of weight in air and water $= d$; and let x = weight of gold, and y = weight of quartz in the specimen. Then,

$x = (ac - abd) \div a - b$, and
$y = (abd - bc) \div a - b$, whence

Rule 9th: Weigh the specimen in air and in water, and note the difference.

From the product of specific gravity of gold multiplied by weight of specimen in air, subtract the product of specific gravity of gold, multiplied by specific gravity of quartz, multiplied by difference of weight of specimen in air and water. The remainder, divided by the difference between specific gravity of gold and specific gravity of quartz, is the weight of the gold.

From the subtrahend above subtract the product of specific gravity of quartz, multiplied by weight of specimen in air. The remainder, divided by the above divisor, is the weight of the quartz. Taking our first example again:

$19 \times 32 = 608$
$19 \times 2.6 \times 4 = 197.6$

$19 - 2.6 = 16.4 \mid 410.4 \mid 25.0244$ ozs. of gold.
And 197.6
$2.6 \times 32 = 83.2$

$16.4 \mid 114.4 \mid 6.9756$ ozs. of quartz.

This rule is easy to work and saves labor. It is, however, less easy to remember than some of the preceding.

When accuracy is desired, as in buying gold specimens with gangue, it is quite important that the *relative* specific gravities, or the displacements, should be obtained, and as it is only necessary that they should be correct relatively, any liquid at any temperature will answer for the determination.

In the first example, reckoning the gold at $20 per oz. the value is $500.40. Had the specific gravity of the specimen been taken as 8.1, the value would have been $502 80. With 8.2 as the specific gravity it is $506.60, and with 9 it is $520 approximately.

An error in the specific gravity of the gold is not compensated by the greater quantity found. In the example referred to, 18.5 specific gravity would give 25.17 oz. of gold in the specimen, but the value would be only about $488.

To mix acid and water, or strong and weak acids, to any strength below the maximum.

Rule—From the density, by Beaume's hydrometer, or specific gravity of the stronger acid, subtract the required density, or specific gravity; the remainder equals the required proportional volume of the weaker acid or water. From the required density or specific gravity, subtract the density or specific gravity of the weaker acid or water, the remainder equals the required volume of strong acid. Measure in the proportion thus found, and mix.

Example—It is required to dilute nitric acid of 54° B. to 32° B.

$54 - 32 = 22$ = proportional volume of water.
$32 - 0 = 32$ = " " " acid.

Again—Required to mix acid of 53° B. with acid of 28° B. to make acid of 32° B.

$53 - 32 = 21$ volumes of strong acid.
$32 - 21 = 11$ " " weak "

The rule will not apply to the dilution of sulphuric acid, because the density of a mixture of sulphuric acid and water is above the mean. I have, however, found it serviceable in preparing nitric acid for parting.

To Convert Degree Beaume Into Specific Gravity.

Divide 145 by 145 minus the number of degrees Beaume, the quotient is the specific gravity.

Example: I have nitric acid of 47° Beaume, what is its specific gravity?

$145 - 47 = 98$ and $145 \div 98 = 1.48$ specific gravity.

To Convert Specific Gravity Into Degrees Beaume.

Divide 145 by specific gravity and subtract the quotient from 145, the remainder is the number of degrees Beaume corresponding to the specific gravity.

Example: I have sulphuric acid of 1.71 specific gravity, what is how many degrees Beaume?

$145 \div 1.71 = 84.8$ and $145 - 84.8 = 60°$ Beaume.

I have taken this rule from an article in the *Chemical News*, in which the matter is thoroughly discussed. It appears that there is a good deal of disagreement between various Beaume hydrometers, and Beaume died without leaving any rules regarding them. Hence the results of the above rule do not quite agree with those of some authorities.

It may seem superfluous to give rules for so simple an operation as the rectification of the normal solution of salt used in the humid assay of silver bullion, yet I have seen students a good deal puzzled over it, and so I venture to offer the following simple rule without explanation:

1st. If the solution is too weak, that is, if it gives too high a result in an assay of test silver:

Multiply the whole quantity of salt which was used in making the solution, by the number of points that the test assay is too high, and divide by 1000. The quotient is the quantity of salt required to be added to the normal solution.

Example: The solution was made with 650 grains of salt. A test assay gives the fineness of pure silver as .1007, or 7 points too high; then $650 \times 7 = 4550$, which, divided by 1000, gives 4.55 grains of salt required to be added to the solution to make it standard.

When dry salt is used in making the rectification, it should not be put at once into the large vessel containing the solution, but should be first dissolved in a smaller vessel, using not water, but some of the normal solution for the purpose. The dish or beaker used may afterwards be washed with a very little water, and the washings added to the solution. The small quantity of water thus added will tend to correct a slight error which might otherwise arise from the fact that a little of the original solution was consumed in making the test assay.

The rule applies equally to the saturated solution of salt used by some assayers for making the normal solution. It may not be mathematically accurate in all cases; that depends upon the cause of the discrepancy, as whether it arises from incorrect measurement of the water in making the solution, or from error in weighing the salt, or from impurity of the salt, but it is practically correct.

Second. If the solution is too strong, that is it gives the result of a test assay too low. Multiply the whole quantity of water which was used or intended to be used in making the solution, by the number of points that the test assay is too low, and divide by 1,000. The quotient is the quantity of water to be added to the normal solution. A correction for the percentage of solution consumed in the test may be made, but it is not worth while, unless only a very small quantity has been prepared. As the discrepancy in this case is almost certain to have been caused by erroneous measurement of the water, the rule may be considered rigidly correct.

To Convert Degree of Fahrenheit's Thermometer into Degree Centigrade

The zero of Fahrenheit is the temperature of snow and salt, which was once supposed to be the lowest possible. The zero of Centigrade is the freezing point of water, or 32° Fahrenheit. Hence, all temperatures above 32° Fahrenheit are plus, or above zero Centigrade; and all below 32° Fahr. are minus, or below zero Centigrade. From the freezing point to the boiling point is 180° on the Fahrenheit scale; on the Centigrade it is 100°. Now, 100 is $\frac{5}{9}$ of 180; hence, to convert degrees F. into the corresponding degrees C., we must multiply by 5 and divide by 9. Zero C. being 32° F., we must observe the following rules:

For temperatures above 32°, subtract 32, multiply the remainder by 5 and divide by 9. The quotient is plus Centigrade. For temperatures below 32°, subtract the number of degrees from 32, multiply by 5 and divide by 9; the result is minus C. For temperatures below zero F., add 32, multiply by 5 and divide by 9; the quotient is minus C. To state it briefly:

Multiply degrees above or below 32 by 5, and divide by 9, remembering that if the degree Fahrenheit is above 32, the corresponding degree Centigrade is +, but if below, −.

Example—Convert 45° F. into C.; $45 - 32 = 13$ and $13 \times 5 = 65$, then $65 \div 9 = 7.22°$ C.

As 45 is more than 32 it is plus, although the sign need not be prefixed, being understood. But, convert 28° F. into C.; $32 - 28 = 4$, and $4 \times 5 \div 9 = 2.22$, and because 28 is less than 32, the sign is $-2.22°$ C. Convert $-17°$ F. into C.; $17 + 32 = 49$, and $49 \times 5 \div 9 = -27.22°$ C.

To Convert Degrees Centigrade into Degrees Fahrenheit.

If above zero, multiply by 9, divide by 5, and add 32. The sign is +.

Example: Convert 24° C. into F.

$24 \times 9 = 216$, and $216 \div 5 = 43.2$, and $43.2 + 32 = 75.2°$ F.

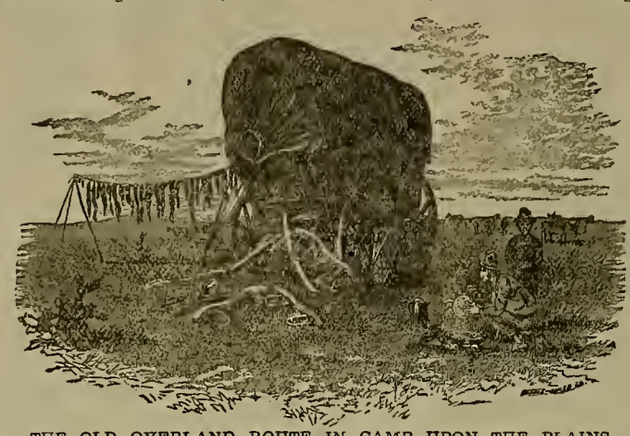
If below zero, multiply by 9, and divide by 5, and if the result is more than 32, subtract 32, and the sign is minus; but if less, subtract from 32, and prefix the plus sign.

Example: Convert $-52°$ C. into F.

$52 \times 9 = 468$, and $468 \div 5 = 93.6$; then, as it is more than 32, subtract that number, and $-93.6 - 32 = -61.6°$ F. Again: Convert $-6°$ C. into F. $6 \times 9 = 54$, and $54 \div 5 = 10.8$, which, being less than 32, must be subtracted therefrom, leaving 21.2° Fahrenheit, which is plus.

A Reminiscence.

Now that the railroads are racing westward, and the whole expanse of the central regions bids fair to be gridironed with the tracks, it is worth while to remember for a moment the method of crossing the plains, which brought many of our older readers to this coast. The prairie schooner, as a pioneer of civilization, is a theme which will engage the attention of the historian, for its service in the development of the country is well defined. It will be hard for those who crossed the plains in the early days, and have not since retraced their steps, to realize the change which has come over many of the solitary scenes through which they passed. The herds of buffaloes have given place to the herds of cattle which supply the Eastern markets; the timid antelope has been superseded by great flocks of sheep; trees, farm-houses and cultivated fields are changeing the lonely wastes into agricultural regions, whose aggregate products are reaching high figures, and are yet but at the beginning. It is wonderful, passing the belief almost, of those who saw the plains in their recent wildness, that so great progress should have been achieved in so short a time. And the end is not yet. It is probable that the next quarter of a century will far outstrip the last in the peopling and subjugation of the wild west.



THE OLD OVERLAND ROUTE—IN CAMP UPON THE PLAINS.

Chrome Iron in Placer County.

Some two years since chrome iron was discovered about seven miles east of Iowa Hill. The first attempt to commercially utilize it has been made this year, 100 tons having been shipped to San Francisco. The ore, which is of excellent quality, is found in irregular disconnected masses imbedded in the country rock and varying in weight from a few pounds to several hundred tons. On the largest mass yet found a shaft 20 ft. deep has been sunk and does not pass through the deposit. It is expected that the prospecting now going on will develop a large and continuous ore body.

Nearly all the hydraulic mines of Placer county are fitting up preparatory to the water season. The threatened injunction by the authorities of Sacramento county has delayed work on the Iowa Hill divide, some of the miners waiting for a decision by the Courts.

For conducting the suits against the hydraulic miners of Sacramento county, the Supervisors of that county, or rather four out of the seven of them, have voted to George Cadwalder the sum of $12,000, as follows, to wit: The $3,000 allowed to him already under resolution of June 28th; the second payment of $3,000 shall be paid on the first Monday in January, 1882; the third payment of $3,000 shall be paid on the first Monday in July, 1882, and the last payment on the termination of the litigation.

It is now said that Oakland will soon have rolling mill.

The Drainage Act Unconstitutional.

The great case known as the Slickens case (People vs. Parks) has been decided by the Supreme Court and the judgment of the Superior Court of Sacramento county, from which Court the case was appealed, has been reversed.

The opinion considers the constitutionality of the Act of April 23, 1880, entitled, "An Act to Promote Drainage," and declares it to be unconstitutional on account of its contravention of Section 24 of Article IV. of the Constitution, which requires that every act shall embrace but one subject, which shall be expressed in its title.

The leading opinion is by Justice McKee, concurred in by Chief Justice Morrison. We are unable to give the decision in full owing to its length, but condense as follows:

The question presented for consideration in this case involves the constitutionality of an act of the Legislature, passed April 23, 1880. It is contended that the act is unconstitutional and void, and is no law, because it contravenes Section 24 of Article IV. of the Constitution, which requires that every act shall embrace but one subject, which shall be expressed in its title. In the consideration of such a question, it is a cardinal rule that nothing but a clear violation of the Constitution will justify a court in overruling the Legislative will. Every statute is presumed to be constitutional, and every intendment is in favor of its validity. When a statute is challenged as in conflict with the fundamental law, a clear and substantial conflict must be found to exist to justify its condemnation, but when found, courts must not hesitate to condemn.

The Sovereign Capacity of the People.

The Constitution is the voice of the people in their sovereign capacity, and it must be heeded. When it speaks in plain language with reference to a particular matter, it must have effect as the paramount law of the land. According to the Constitutional requirement for the enactment of statutory law, the title of every bill introduced into the Legislature must denote the subject of legislation, and when the Legislative bill on that subject has assumed the form of law, its provisions must correspond with the subject of which the title is the name, standing for and representing it. The title of the act under consideration fairly indicates but one subject. As expressed in the title, the whole object of legislation is "to promote drainage." Anyone, after reading the title, would naturally expect to find in the body of the act provisions for carrying that into effect as the whole object of the law, because such provisions, in view of the constitutional provisions referred to, would be necessary to give unity and wholeness to the law. Looking beyond the title to the provisions embodied in the act under consideration, it will be found that they embrace more than one subject, and the question is whether all of them fall within, or anyone of them falls without, the subject expressed in the title. By Sec. 1 a Board of Drainage Commissioners is appointed to divide the State into several drainage districts, and to establish the boundaries thereof, and to organize each district for the purpose of carrying into effect the following objects, viz: "The control of debris from mining and other operations, the improvement and rectification of river channels, and the erection of embankments or dykes necessary for the protection of lands, towns or cities from inundation."

Officers and Powers of District Boards.

Of the Board thus established, the Governor of the State was appointed President, and to him, as Governor, was given power to appoint within ten days after the organization of any drainage district, three persons resident of the district to act as a Board of Directors for the district, each of whom was to receive a salary of $100 per month, and to hold office for four years, and until his successor was appointed and qualified. To each of such Boards was given power to appoint a Secretary and a district and resident engineer and to fix their salaries; to determine upon, with the aid of the State Engineer, a system or plan of works to be constructed in its district; to agree upon and adopt plans for such works; to award contracts for the construction of the same, upon the basis that no Chinese shall be directly or indirectly employed upon them, etc. Each Board was employed to raise money, in exercise of the powers of assessment and taxation, by levying a tax upon all the property of the district, to the extent of one-twentieth of one per cent. on the value of the taxable property therein, and an assessment upon all the hydraulic mines and all the mines washing earth or ores with water, of one-half of one per cent. for each miners' inch of water of each 24 hours' run used during the year; and upon all swamp and overflowed lands in the district, to the extent of not exceeding $3 per acre. In addition to which, provision was made for the levying of a State tax in the year 1880, and each year thereafter, of one-twentieth of one per cent. on all the taxable property in the State. All these assessments and taxes were made collectable and payable as State and county taxes.

The Scope of the Drainage Act.

But the moneys thus raised were to be used "exclusively for the construction of dams for

(CONTINUED ON PAGE 228.)

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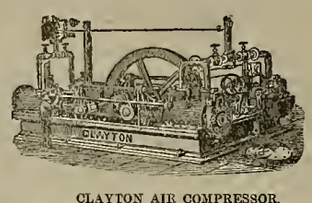

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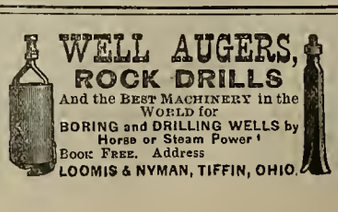

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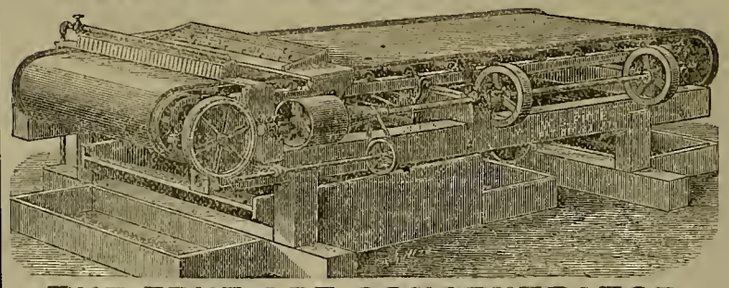
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies Iron Work complete for Wood Frames, also

SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.

☞Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores Wet or Dry Crushing Mortars.

MOREY & SPERRY—Warerooms, 92 and 94 Liberty St., N. Y.

$1,000 CHALLENGE!

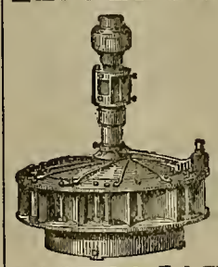


THE FRUE ORE CONCENTRATOR.

Nearly 300 are now in use, giving entire satisfaction. Awarded First Premium and Silver Medal at the Industrial Fair for 1880 of the Mechanics' Institute of San Francisco, Cal.
Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.
We challenge any other Concentrator in use for a fair and impartial competitive trial, side by side, for stakes of $1,000 each, and we mean business.
☞A machine with all improvements can be seen in working order and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont street.

ADAMS & CARTER, Agents, Room 7 No. 109 California Street, S. F.

LEFFEL'S IMPROVED WATER WHEEL.



PRICES REDUCED!
PATENTS REISSUED 1868.
The "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.

Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address

JAMES LEFFEL & CO., Springfield, Ohio,
and 110 Liberty St., N. Y. City.

PARKE & LACY, Sole Agents, 21 and 23 Fremont St., S. F.

GIANT POWDER
MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS.
Nos. ONE, TWO and THREE.
Stronger, Better and Safer than any other High Explosive
Judson Powder
IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.
It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞Triple Force Caps and all Grades of Fuse.

BANDMANN, NIELSEN & CO.,
SAN FRANCISCO, CAL.

SELBY SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.

Gold and Silver Refinery And Assay Office.

HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.

Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.

This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

Mines and Mining Properties Solicited for Sale.

I have unexampled facilities for rapidly placing Mines and Mining Properties, and claims of
Ascertained Value
Upon the Market, through my Branch Offices in
NEW YORK, BOSTON,
PHILADELPHIA,
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OWNERS OF
Meritorious Mines and Prospectors
WHO HAVE NOT THE MEANS TO PROPERLY DEVELOP THE SAME MAY FIND A PURCHASER THROUGH MY OFFICE.

If You Have a GOOD MINE, or a GOOD PROSPECT for sale, apply to me in person or by letter.

JAMES. A. MARS,
45 to 49 Merchants' Exchange, California St
SAN FRANCISCO, CAL.

REFERENCES:
London and San Francisco Bank, S. F., Cal.
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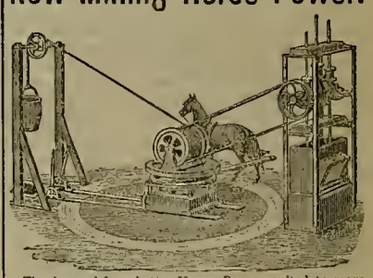
Daniel Meyer, Capitalist, S. F.
Prof. Thos. Price, M. E., S. F., Cal.

New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.

C. H. BAKER,
Agent and Manufacturer of Mining Machinery
18 and 20 Fremont St., S. F.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

GRAIN SEPARATOR.—James Root, Black's Station, Cal. Dated, Sept. 20, 1881. No. 247,274. The operation of this machine is in the main similar to implements of this class. The action of the fan blower is the same, and the passage of the stuff through the sieves and final separation of the cheat from the wheat and discharge of the latter present generally no new features. The particular combination, however, contributes to an improved result.

MACHINE FOR MORTISING DOORS FOR LOCKS.—T. N. Andrews, S. F., dated Sept. 20, 1881. No. 247,149. This boring machine for mortise locks consists in a mechanism for simultaneously actuating a series of augers or bits to bore the holes in the edge of the door, and a means for firmly securing the machine to the door, whereby a mortise may be fastened on a door already hung. Both hands are left free to operate the machine. Means are also provided for withdrawing the augers by reversing the cranks.

EXCAVATOR FOR EMBANKING MACHINE.—John G. Dawes, Fresno, Cal. Dated Sept. 20, 1881. No. 247,176. This invention relates to the class of excavating and embanking machines, and it consists of a peculiarly formed revolving cylinder provided with spiral or screw flanges on its several sections, extending from end to end inside, said flanges forming a continual spiral flange through the cylinder, the cylinder having attached to itself, and receiving the earth from, a plow on one side, and being adapted to be added to and extended as the width of the excavation demands.

TRICYCLE.—Henry C. Bridgman, Milpitas. Dated Sept. 20, 1881. No. 247,156. This improvement in tricycles consists of a peculiar frame, the end of which is supported by a steering or guiding wheel, and the forward end by two large wheels, which are propelled by cranks operated by the hands, the seat hung or placed as to render this possible. The steering is accomplished by the feet, which are fitted to stirrups connected with the guiding wheel by means of cords, and operated in the same way racing boats are guided. The novelty in the invention consists in so journaling the large driving wheels so as to be independent of each other, so that each can be operated separately to turn corners and in adapting them to be revolved by hand.

ORE FURNACE.—Ottakar Hofmann, Pinal, Arizona. Dated Sept. 20, 1881. No. 247,193. Mr. Hofmann's improvement in ore roasting furnaces consists essentially in combining with a revolving cylinder furnace two fireplaces, one at each end, and connecting to it with the furnace, and also with the escape flue. Suitable dampers are fitted between each fireplace and the escape flue, so that when a fire is built in one fireplace, its damper may be closed and the flame directed through the furnace and its flue to the chimney. After the ore at the end of the cylinder nearest the first fireplace is properly roasted and chloridized, a fire is built in the other fireplace, and the first one suffered to go down. The damper of the first one is opened while that of the second is closed, so that the direction of the heat is changed and the ore nearest the second fireplace is subjected to the highest temperature. This enables the inventor to chloridize the ore quickly without exposing that at one end to an injurious temperature in order to heat that at the opposite end to a sufficient temperature. Mr. Guido Kustel 318 Pine street, in this city, can give further information about this furnace to those desiring it.

GOVERNOR FOR STEAM ENGINES.—Lee W. Andrews, Live Oak, Sutter Co., Cal. No. 247,235. Dated September 20, 1881. This new mechanism for governing the admission of steam to engines, consists of a two-part cylindrical valve reciprocating in a cylinder, the two parts having two stems passing through them with collars which prevent the parts from separating beyond a certain point. A spring of sufficient strength to keep the two parts pressed against the collars is inserted between them. One of the stems is suitably connected with an operating crank or eccentric upon the engine shaft, and the other is connected with a crank arm upon a balance-wheel, which has a coiled spring and operator like the balance of a watch. This spring is set to a tension which causes it to vibrate in unison with the reciprocating movements of the valve and engine; but its resistance to any increase in speed will retard the forward movement of the leading part of the two-part valve, diminishing the open space between the valves, thereby cutting off steam. If the speed of the engine should decrease, the momentum of the valve will cause it to retard the leading part of the valve, thereby allowing the valves to be kept open by the spring, which tends to separate them and allow a greater admission of steam to the engine.

The Drainage Act Unconstitutional.

(CONTINUED FROM PAGE 225.)

imponnding the debris from the mines hereinbefore specified, and for the improvement and rectification of river channels, in which said debris flows, within the drainage district to be formed under the provisions of this act, at such points as shall be designated by the State Engineer, or deemed necessary by the Board of Directors of such drainage district." It will thus be seen that the body and scope of the act include a combination of subjects. Nor are all the subjects of the act such as would naturally fall within the subject of its title. The storage of debris "from mining and other operations" seems to be the paramount object of this act; to promote drainage the subordinate. What the phrase "other operations" may mean is not clear from the act itself. Under it may be concealed many subjects which are not expressed in the title, and the existence of such a phrase in a statute renders it obnoxious to the constitutional provision under consideration. But the storage of debris, and the promotion of the drainage of a district of country, are things essentially different. The storage of debris is, in its nature, a private enterprise in which the few are only interested. The drainage of a State is a public purpose, in which the public may be interested. To promote a public purpose by a tax levy upon the property in the State is within the power of the Legislature; but the Legislature has no power to impose taxes for the benefit of individuals connected with a private enterprise, even though the private enterprise might benefit the local public in a remote or collateral way. Legislative power of taxation is not illimitable. "Taxation is a mode of raising revenue for public purposes. When it is prostituted to objects in no way connected with the public interest or welfare, it ceases to be taxation and becomes plunder."

Declarations to Public Purposes.

At least these two heterogeneous subjects are embraced in the act, one of which is not expressed in the title, and they cannot be segregated. The title does not express the objects or legislation embodied in the provisions of the act. It is, therefore, narrower than the body of the act, and fails to impart that notice of measures enacted which the constitution requires. To prohibit such legislation was the sole end and aim of the constitutional requirement. Moreover, the Legislature has not in any of the provisions of the act, designated any particular river, stream or locality within the State where drainage is necessary. To declare a public purpose, and to create a district over a designated area of the State in which that purpose shall be accomplished, and to provide ways and means for its accomplishment, are matters which belong exclusively to the Legislature. Furthermore, the act is unconstitutional, because it authorizes a local board to levy a tax and two assessments for a public purpose, at the same time, upon the same property, in addition to a tax levied by the State for the same purpose upon all the property of the State, which, of course, includes the property within the district. Duplicate or triplicate taxation levied at the same time, and for the same purpose, and upon the same property, within a territory of the State which has not been established by the Legislature as a special taxing district, is void, whether levied according to the standard valuation or benefits. Such taxation is destructive of that equality and uniformity which the Constitution requires for the validity of every tax. Judgment reversed.

Concurrent Opinions.

Justice Ross's opinion, concurred in by Justice Thornton, concurs with the foregoing. It says there is no power anywhere to compel the Boards of District Directors to establish any particular district or districts, for the act has left the determination of those questions to their judgment and discretion. This it could not constitutionally do. The establishment of such districts is a legislative function, to be exercised by a legislative body, and the Legislature is expressly prohibited by the Constitution of the State from clothing any of its executive officers with such power. Numerous other objections are made to the act, which need not be determined, since the one just considered is fatal to it.

Justice Myrick also filed a concurring opinion, which says: The act is obnoxious to the Constitution, in that part of it discussed, in the opinion of Mr. Justice Ross and the opinion of Mr. Justice McKee. It may be very much doubted if by the so-called Drainage Act even its probable meaning and intent is expressed, viz: In speaking of the formation of districts it says: "Each of which shall include a territory drained by one natural system of drainage." It does not say that each district shall include all the territory drained by one system, but that the territory included within the district shall be drained by one system; a distinction leaving open a wide door for the creation of an almost unlimited number of districts. Therefore, and for the reasons given upon this subject by Mr. Justice McKee and Mr. Justice Ross, I concur in the judgment.

Justice McKinstry's concurring opinion says: So far as the tax on all the lands in the district is concerned, it may, under the act, be required to be paid before the work is completed or commenced. But if this were not so, the defect is in the law itself, which cannot be held to be good, because, by possibility, all the money raised in the State at large, and from the three modes of taxation applicable within a district, may be expended by the Board of Directors of that district.

The Dissenting Opinion.

Justice Sharpstein dissents. In his opinion he says: The conclusion at which I have arrived is that if all those provisions of the act which contemplate the raising of funds by taxing or assessing any property other than that of the entire State should be held to be unconstitutional, the defendants could not be ousted from office, nor enjoined from letting contracts, nor in this action from levying a tax within the district specified; and if the act is constitutional to the extent which I think it to be, it is quite clear that this Court cannot hold that said district has not been legally formed. It not being clear to my mind that those provisions of the act which affect the people of the entire State are unconstitutional, I think that the judgment of the court below should be affirmed.

Congressman Berry on Hydraulic Mining.

Congressman Berry, of the Third California District, gives his views as follows, through the Sutter *Farmer*, on the subject of hydraulic mining:

1. That it is apparent that if hydraulic mining continues in the future as in the past, the navigation of our rivers and of the bay of San Francisco must ultimately be destroyed, and the greater portion of the Sacramento valley rendered uninhabitable.

2. It is my opinion that no remedial measures will be effectual to prevent this result if that system of mining continues.

3. That all remedial measures that can be applied will be necessary to take care of the material already in the rivers and drainage ways, together with that which will find its way into them from other mining, and the abrasion of the mountains from other causes.

4. Whatever may be the cost of remedial measures rendered necessary by reason of mining in the past, I believe should be paid by the National Government or the State or both.

5. I believe that the law when laid down by the courts will prohibit hydraulic mining, as well as the use of any property by one party or individual when such use results in the destruction of, or injury to, the property of another.

6. Inasmuch as it is evident, and is acknowledged, that hydraulic mining has and is resulting in the destruction of and injury to the property of others, I believe it should be restrained until the right to so mine is determined.

7. As the peace and prosperity of our State will be greatly promoted by the settlement of this question, I believe it is the duty of every citizen to lend his influence to consummate that end.

PRACTICAL RECEIPTS AND PROCESSES.—Mr. A Roman, well known as a bookseller and publisher in this city, has again established himself in his old business at 120 Sutter street. He now makes a specialty of technical and standard works, and encyclopedias. Among the latter which he now has, is "Dick's Encyclopedia of Practical Receipts and Processes," containing 6,422 receipts, embracing thorough information, in plain language, applicable to almost every industrial and domestic requirement. Mr. Roman tells us that the utmost care has been bestowed on this work, to make it exact and reliable, and to this end most of the receipts have been tested to prove their value. Minute directions are given relative to the substances required, their proper proportions, how to prepare, mix and apply them. An important feature is also that the book points out and explains tests for proving the purity, strength, etc., of the article to be used. In fact, the work is a condensed form or comprehensive book of reference for almost every receipt and formula that may be required in the industrial arts, professions, trades and manufactures, medicine, and the ordinary occupations of daily life. The receipts are all classified, and a copious index renders them available for immediate reference. We have not seen so useful a work for many a day. It is complete in one royal octavo volume, bound in cloth, and costs $5.

RICH FIND AT SPRING CITY.—Authentic reports of an important strike in the Live Yankee mine at Spring city, have been received at Winnemucca. The *Silver State* says the ledge is said to be over six ft. wide, and the ore will average over $300 to the ton. Nicholas Frayer, generally known as "Big Nick," has been at work on the claim for several months, and at last his labor has been rewarded by striking a body of ore which will make him independently rich. The Live Yankee is located south of the Bullion of Paradise, and adjoins that mine on the same lead. The owner has extracted a car-load of ore in a few days which it is estimated will yield $300 to the ton.

THE doors of the National Bank of Luxemburg were closed by the Government on Monday. The notes of the bank will no longer be accepted at the public treasuries. The bank is obliged to go into liquidation.

News in Brief.

THERE is now no smallpox in The Dalles.

THE Mrs. Garfield fund amounts to $317,000.

ALL four saw mills on Coos bay are now at work.

DEER are reported scarce in the mountains of Siskiyou.

GUITEAU'S trial is not expected to begin before December.

THE new hospital at San Diego will soon be completed.

THE Klamath Indians have raised 20,000 bushels of wheat this year.

THIRTY thousand cords of firewood are piled at Crystal bay, Lake Bigler.

THE arrival of emigrants at Castle Gardon since January 1st foot up 328,000.

RIVERSIDE proposes to donate $100,000 toward building the California Southern railroad.

THE Indian troubles in Arizona have been ended by the surrender of nearly all of the hostiles.

THE upper Salmon creek mill, Mendocino county, shuts down at the end of this month for want of shipping facilities.

THE Sanitary Commission has received a telegram from Djiddah, Arabia, announcing that cholera has broken out among the pilgrims at Mecca.

UP to the 20th of this month, 41 schooners have arrived and departed from Westport, Mendocino, ladened with ties, posts, bark, lumber, etc.

MESSRS. HALL & COLLINS, of Haywards, have completed clearing 22 acres of 9-year-old blue gum trees. They took out 14,600 trees and obtained 1,200 cords of wood.

D. W. BALCH of San Francisco and S. C. Scoville were fatally shot at a meeting of the Directors of the Nevada and Oregon railroad company, in Reno, Nev., Monday.

A SLEEPING CAR on the Canada Southern railroad was thrown into the Detroit river at Amherstburg, Canada West, Monday. All of the passengers but one were saved.

THE ship *Alice Buck*, loaded with rails for the Northern Pacific railroad, went ashore at Half Moon Bay, south of San Francisco, and became a total wreck. Several lives were lost.

A BEAUTIFULLY cut California granite vase, from the Penryn Placer county Granite Quarries, has been presented to the State Mining Bureau. It stands 25 inches high, and is highly polished.

RUMORS of war between China and Japan are still afloat, and there is some talk of an Embassy being sent to Peking to effect a solution of the difficulty which exists between the two countries.

JAS. R. KEENE has purchased for $75,000 an estate near New Market, England, on which he intends having stables erected solely for the purpose of training his horses himself, going over to see them run and superintending all affairs connected with them.

CHOLERA has again made its appearance in Japan, and, singular to say, it has broken out in Kagoshima, the very same place in which the first cases occurred in 1877, when it made sad havoc throughout the land. The epidemic is said to be spreading rapidly.

KING ALFONZO, in the opening sitting of the Antiquarian Society, expressed the friendly feeling of Spain toward America. This society was founded at Nancy, France, in 1873, for the promotion of investigations into the antiquities and history of America, before and after its discovery by Columbus.

DR. BOYNTON has partially explained his views of the case of President Garfield. He reiterates the statement that the bullet was found in a basin, after an unsuccessful search in the region of the body where it was supposed to be located. A detailed account of the autopsy is being prepared by the attending surgeons.

ANOTHER rise in rents is recorded in New York, the advance being very decided over the price asked for houses last spring, the increase being all the way from 10% to 25% in attractive localities. Despite the large amount of building this summer, the demand for suitable dwellings is largely in excess of the supply.

TWO routes are under consideration for the California and Oregon railroad, the one by way of Redding, through Shasta and Siskiyou counties, and the other due south from Rosehurg, through the coast counties to Cloverdale, there to connect with the Donahue road. It is thought that this line will be completed in 1883.

THE whaling bark, *Daniel Webster*, was crushed in the ice off Point Barrow, during the latter part of last July. All of the crew escaped, with the exception of one seaman, who attempted to walk across the ice from Point Barrow to a point some distance below, but who perished from exhaustion. The balance of the crew were taken aboard the schooner *L. N. Handy*.

ALPH BEALL, the chief of the surveyors of the Idaho, Clearwater and Montana company, reports a discovery and thorough examination of a railroad pass through the Bitter Root range, south of the Loto, whose maximum altitude above the sea level is less than 4,500 ft., with approaches from both east and west upon a grade of less than 65 ft. per mile. There is no danger from snow slides. There are large quantities of the best class of timber along the route, which follows water courses nearly the whole distance from Lewiston to the summit of the pass. The party, in behalf of the company, made a location of the pass, broke ground, and did other work with the purpose of holding it.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. McGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CRENWELL—Yuba and Sutter counties.
D. W. KELLHER—San Joaquin and southern counties.
C. E. WETMORE—Alameda county.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct, or it the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We will send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

ANNUAL STATISTICIAN of 1881.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 316 California st. Price, $4.

COPP'S "U. S. MINERAL LANDS, LAWS, FORMS, INSTRUCTIONS AND DECISIONS."—1881. 570 pp. In full law binding, $4.50; half law binding, $3, at this office.

San Francisco Metal Market.

[WHOLESALE.

WEDNESDAY, September 28, 1881.

IRON.—			
American, Pig, soft, ton	—	@	30 00
Scotch, Pig, ton	—	@	25 00
American White Pig, ton	—	@	—
Oregon Pig, ton	—	@	26 00
Clipper Gap, White	—	@	26 00
Clipper Gap Car Wheel	—	@	35 00
Refined Bar	4½	@	8
Horse Shoes, keg	7 00	@	8 00
Nail Rod	—	@	9½
Norway, according to thickness	8½	@	9½
STEEL.—			
English Cast, lb	16	@	18
Black Diamond, ordinary sizes	13	@	15
Drill	15	@	18
Flat Bar	—	@	16
Plow Steel	15	@	16
COPPER,—			
Ingot	—	@	52
Sheet	—	@	20
Sheating, Tinned 14x18	—	@	42
Nails	—	@	—
Bolts	38	@	42
Old	—	@	18
Bar	—	@	22
Cement, 100 fine	—	@	15½
LEAD —			
Pig	—	@	4½
Bar	—	@	6
Pipe	—	@	8
Sheet	—	@	9
Shot, discount 10% on 600 Bags			
Drop, per bag	—	@	2 10
Buck, "	—	@	2 30
Chilled "	—	@	2 50
TIN PLATES.—			
10x14 I C Charcoal	—	@	7 60
10x14 I C Coke	6 00	@	6 25
Banca Tin	—	@	25 00
Australian	—	@	22 00
I. C. Charcoal Roofing 14x20	—	@	7 25
" " " 20x28	20 00	@	21 00
ZINC.—			
By the Oask	—	@	9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	—	@	10
NAILS.—			
Assorted Sizes	3 50	@	3 75

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending September 27, 1881.

HIGHEST AND LOWEST BAROMETER.

Sept. 21	Sept. 22	Sept. 23	Sept. 24	Sept. 25	Sept. 26	Sept. 27
29.998	29.942	30.146	30.139	30.033	29.925	29.806
29.828	29.806	29.942	30.012	29.903	29.806	29.743

MAXIMUM AND MINIMUM THERMOMETER.

66	66	64	63	69	69	62
54	57	52	65	56	56	53

MEAN DAILY HUMIDITY.

80.3	82.7	81.7	79.7	73	66.7	76.7

PREVAILING WIND.

SW	SW	W	W	W	W	W

WIND—MILES TRAVELED.

199	253	177	164	153	139	210

STATE OF WEATHER.

Fair.	Cloudy	Clear.	Clear.	Clear.	Clear.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

—.	.25					

Total rain during the season, from July 1, 1881, 0.25 inches.

Amusements.

BALDWIN'S THEATER.

J. H. YOUND.....Lessee and Manager.

PRIULI, THE ITALIAN.

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Location of principal place of business, San Francisco, Cal. Location of works, Aurora, Esmeralda County, Nevada.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 29) levied on the 20th, day of August, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. Shares.	Amt.
Richard A. Chase	25	50	$10.00
Moses O. Kyes	147	7	1.40
Moses O. Kyes	187	3	60
Dr. A. Farnsworth (unissued)		40	8.00
F. Staehler	225	10	2.00
F. Staehler	255	10	2.00
Dr. B. S. Mason	259	35	7.00
Larkin Smith	261	50	10 00

And in accordance with law, and an order of the Board of Directors, made on the 20th day of August, 1881, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the Auction Rooms of Maurice Dore & Co., 410 Pine St., San Francisco, California, on Monday, the 17th day of October, 1881, at the hour of 10 o'clock, A M., of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

GEO. H. PECK, Sec'y.

Office—Rooms of Dr Knowles, 118 Dupont street, San Francisco, Cal.

Newcastle Gold Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Yankee Hill Mining District, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Twenty-third (23) day of September, 1881, an assessment, (No. 2) of two (2) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 33, No. 318 Pine St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the First (1) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Twenty-first (21) day of November, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

E. G. MATHEWS, Sec'y.

Office—Room 33, No. 318 Pine St., San Francisco, Cal.

ALEX. DEL MAR,
Mining Engineer,

Late Director of the United States Bureau of Statistics Mining Commissioner for the United States Monetary Commission, etc., No. 216 Sansome St., San Francisco. Cable address—"Del Mar, San Francisco." Branch Office, 61 Broadway, New York. Cable address—"Del Mar, New York." London Agency: H. Stodes & Co, 24 A, Southwark St., S. E. Cable address—"Del Mar, London." Paris Agency: J H. McDonald & Co., 13 Rue St. Lazare. Cable address—"Del Mar, Paris."

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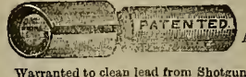

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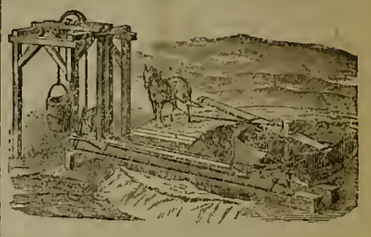

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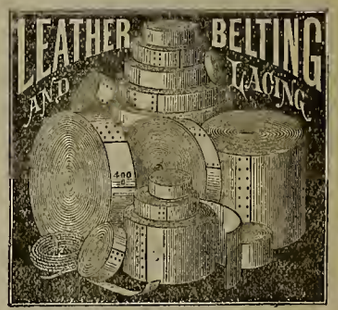

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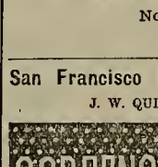

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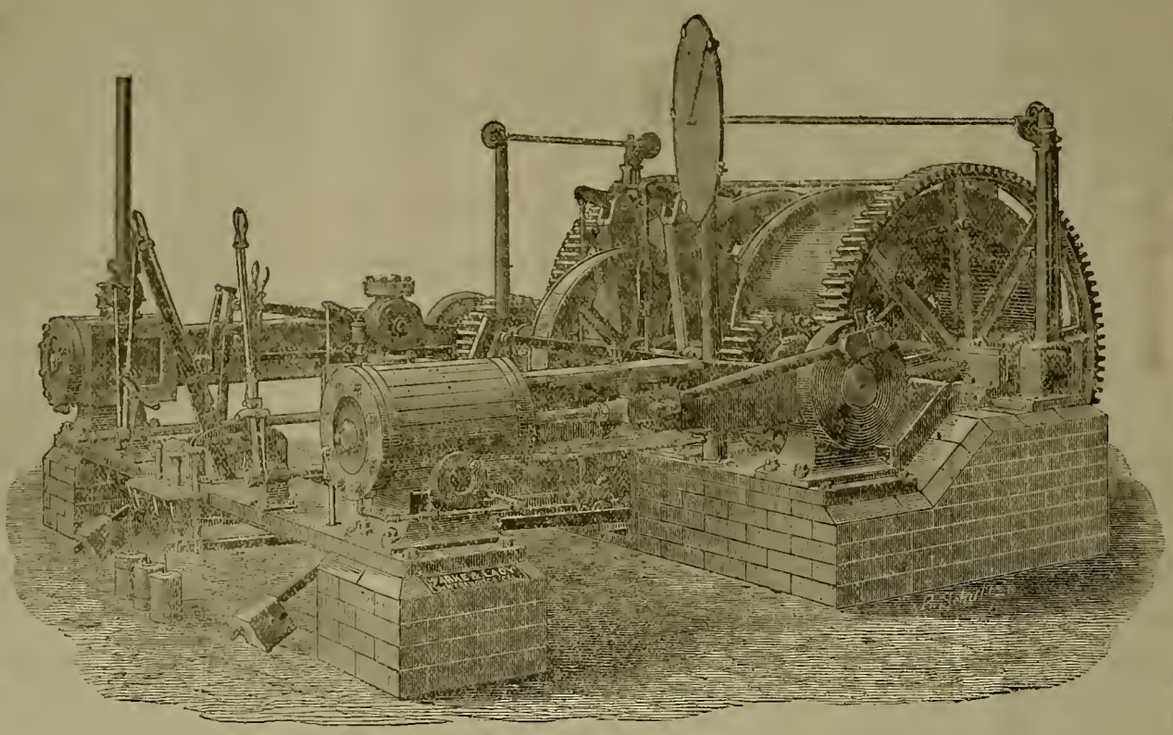

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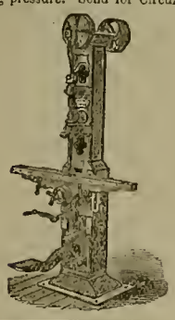

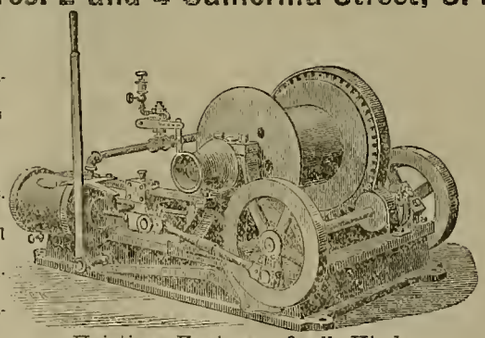

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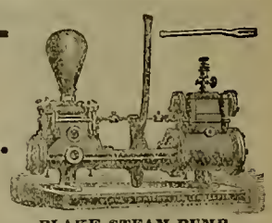

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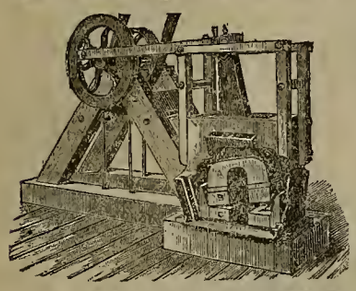

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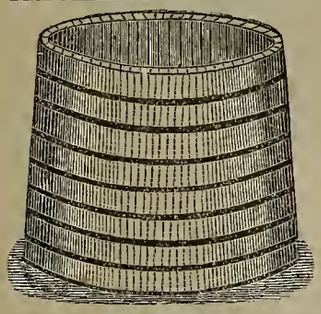

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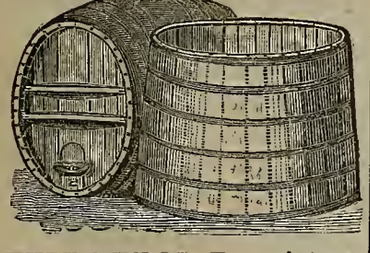

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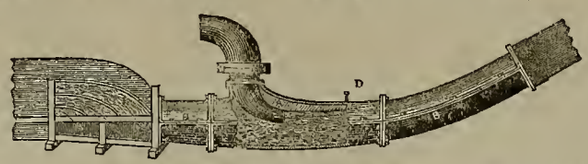

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, OCTOBER 8, 1881.

VOLUME XLIII Number 15

The Right to Mine by Law and Custom.

In its answer, in the Superior Court, to the People *vs.* The Gold Run Ditch and Mining Co., the mining company makes some telling points on the question of the laws and customs of miners, and their rights to continue mining, as the following paragraphs show:

Defendant denies that the navigability of the Sacramento river, or the roads or highways in the American and Sacramento valleys, are in danger of destruction or injury from alleged wrongful acts of defendant, or by anything that it intends to do; also denies that from the tailings or deposits from defendant's and other mines, the beds of the American or Sacramento rivers will become so choked and filled up as to turn said rivers from their natural channels, or that said valleys will thereby become dismal swamps, and incapable of cultivation or habitation, or that the working of said mines will in any way contribute to such injurious results.

XII. Defendant as a separate defense avers that it is a duly organized and incorporated body, under the laws of the State, for the purpose of mining by the hydraulic process, and has been engaged in hydraulic mining, and the sale of water to miners and others since August, 1870; that it is the legal owner and possessor of the mines and mineral lands mentioned in the complaint; that defendant has been the owner and possessor of said land and mines since 1872; that the natural discharge of water and tailings from said mines is into Canyon creek, which empties into the north fork of the American river about 70 miles by river above Sacramento; that said mines are located in the Gold Run mining district, which was organized in 1854, and which has ever since maintained its organization as such; that said mines were located and acquired by the grantors and predecessors of defendant in accordance with mining laws and customs of miners in said district, at various times between the years 1854 and 1863; that the right and title thereto has ever since been held in accordance with such laws, customs, etc., and in accordance with the statutes of California, and the decision of the courts of said State and the Acts of Congress; that said mines are of the class distinctively known as hydraulic mines, and have been continually worked as such by the present and former owners from 1854 to 1881, during all of which time defendant and its predecessors have discharged the tailings and water therefrom into said Canyon creek and upon its banks, being upon lands owned by defendant and held under mineral patent from the United States; and that such mining and discharge of water and tailings was in accordance with the laws and customs of miners and the statutes and decisions of the State and the United States relating to mines and mineral lands; that said Canyon creek is the natural and only outlet from defendant's mines: that the discharge of tailings and water therefrom since 1854 to July last have always been upon defendant's own patented lands in said Canyon creek and upon its banks, and nowhere else, and that only such quantity of tailings have been so dumped as was indispensable in working said mines, and as defendant had a right to do. Defendant avers that 16 hours per day, for five months in the year, is the average time during which it has worked its said mines; that 2,150 inches of water is the full amount used at any time, and that not more than 500,000 cubic yards of earth have been annually washed down.

W. A. SKIDMORE, of the Miners' Association, accompanied by engineers W. T. Lewis and P. M. Randall, are examining the mining region on the headwaters of the American river in connection with the forthcoming suits brought by the State against the Gold Run and other companies.

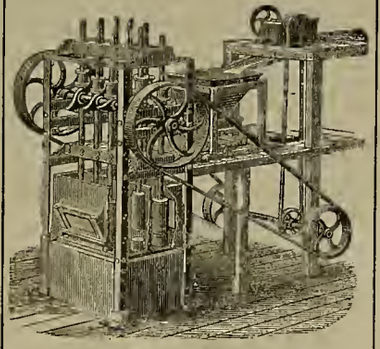
THE Oroville *Mercury* says: During the past week M. Manson with a crew of men have been in town, making cross sections of the river at various points between the mill and the lower end of town. He is employed by Col. Mendell, and the object of these surveys is to show the capacity of the river at various points.

New Style of Quartz Mill.

C. H. Baker, of 18 Fremont street, this city, has recently patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, a composite frame stamp mill having ten stamps on one foundation. This arrangement is shown in the engraving on this page.

By the combination of two mortars on one mortar block, as illustrated here, with discharge from front, rear and ends in dry crushing, the inventor claims to be able to furnish a complete 10-stamp mill, with strong angle-iron frame and wood girders for cam shaft and stem guides, giving greater strength, and at the same time, less friction and jar on the machinery, than a wood frame of the old style. The iron corner posts rest in cast shoes, fastened to sills running back under ore platform on each side of mortar block, the frame having independent foundation from mortar.

The parts are so fitted together and marked that any good miner can readily put them in place. While this style of mill retains all the old and well-established advantages of the ordinary stamp mill—the frame work being mainly



Composite Frame Stamp Mill.

of wrought iron—it is not affected by exposure. All the timber used is a good mortar block and platform for ore-feeders, etc.

The building can be of the most temporary nature. Much time and costly labor, as well as freight, can be saved by this style of mill.

Alaska Mines.

Private advices from Sitka by U. S. S. *Hassler* gives us some news which will be of interest to miners, inasmuch as it shows the difficulties of prospecting in some parts of that country. The U. S. S. *Wachusett* had left for Yokatat on Behring bay, for the purpose of arresting, if possible, the Indian who murdered two white men—Kerren Campion and Thos. Maloney—at that place about three months since, and to bring him down for trial, together with the witnesses expected to testify against him. The murdered men were with James Hollywood on his schooner the *Gold Hunter*, a vessel of eight tons, on a prospecting and trading tour. Campion and Maloney started in a canoe belonging to Andrau by an Indian, to ascend some of the rivers in prospecting. The same day, two women, who were gathering grass for baskets on the beach, were attracted by the shots and cries, and discovered the murder. The Indian had remained in his canoe as they landed to make a meal, and, taking possession of Maloney's double-barreled shotgun, shot the latter dead; then fired at Campion and wounded him in the shoulder, and, after a struggle, killed him with a piece of rock. On seeing he was discovered, he pursued the women, who escaped in their canoe. On his return to the village, he made an attempt to kill Hollywood and his wife, who is an Indian woman, together with their children, but was prevented by the Indian doctor and others. The murder was kept quiet for a month, and then told to Hollywood's wife by a boy. It was afterward confirmed by others, among whom were the two Indian women already mentioned. If it had not been for Hollywood's wife, who was an Indian, and traveling with them, they would have killed Hollywood. The latter sailed from Yokatat, in March last, having been compelled to stay there during the winter on account of the danger in navigating the coast at that season. As it was, his vessel was wrecked before reaching Crose sound. Before leaving he had discovered placer diggings which he estimated worth $10 per day to the hand. He took out a quantity of the dirt, and was bringing it with him when his schooner was wrecked.

The miners have long wished to prospect that region, but were deterred by the fierce character of the natives, who have always been dangerous. Some six years ago, they murdered a boat's crew belonging to a schooner which was trading there, but nothing was ever done about it. The visit of the *Wachusett* may result in making it safe to prospect there, and miners, in order to obtain further information, procured, through Capt. Lull, the employment of Mr. Edmund Bean, a miner of long experience, as one of the interpreters of the expedition, and he will make thorough examination of the country. If his report is favorable, there will probably be a new camp started there in the spring. Mr. Hollywood accompanied the party for the purpose of pointing out the murderer.

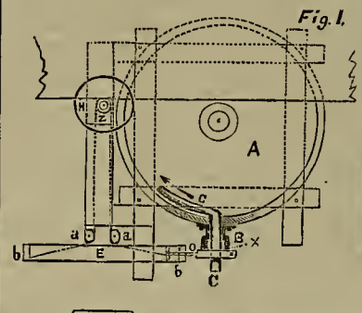
A DISPATCH from Florence (Arizona) says: The *Enterprise* has the following particulars of a rich strike in Mineral Hill camp, 15 miles east of Florence. The north croppings of the Alice mine were prospected yesterday, and found to be wonderfully rich in horn silver. An assay of the ore gave a return of 1,346.81 ozs. in silver to the ton, the assay value of which is $2,387.75. These croppings rise 12 ft. above the surface rock, and are 12 ft. wide and 400 ft long. Shots were put in at different points and one very rich piece of rock broken, in which horn silver could be seen with the naked eye. It is estimated that these croppings contain over 4,000 tons of this rich ore. The strike has created great excitement in the camp.

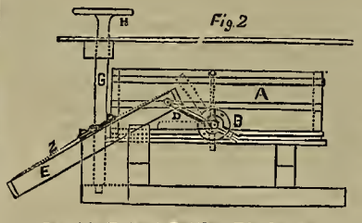
KLAMATH river gravel will no doubt pay well its entire length, but the great body of water below Scott river has prevented much work being done below that point. Efforts have been made on a limited scale in the way of wing-damming, but only to mine ground close to shore, while expensive works to reach the bed-rock channel would realize rich returns. There are now 100 men engaged in river mining between the mouth of Humbug and Scott rivers, in the Klamath, and next season there will be double this number, as many new claims have been taken up.

Discharge for Amalgamating Pans.

Amalgamating pans and settlers have on their outside surface a series of thres, four or five spouts, each provided with a plug to stop up the opening. In drawing off the contents of the settlers, it is important to do it gradually; but the plug holds form inefficient means of doing this, as between one plug hole and the other there must be an intervening space, which, when opening the plug next below this one last opened, the outcoming water will have a head or pressure in proportion to the distance between each plug opening, thereby creating a disturbing current in the already revolving mass of the pulp within the settler, which will cause a certain amount of the small globules of quicksilver to be drawn off and lost, besides also drawing off the quicksilver which will accumulate in the inside cavities of and around the plug openings, on the inside surface of the settler.

H. S. Jacobs invented not long since an apparatus for discharging pans, so as to overcome these difficulties, and this is shown in our engraving. It is made at the Pacific Iron Works, in this city.





Jacob's Patent Settler Discharge.

The device consists of an L-shaped pipe, introduced into the side of the settler near the bottom, inclosed in a stuffing box.

The inner branch of this pipe is made to conform to the curve of the side, with its opening in the direction of the pulp current. When the settler is charged, the pipe is in a vertical position, projecting above the level of the pulp. When a charge is drawn off, the end of the pipe is lowered just beneath the surface, until the discharge is completed, when it is again turned to a vertical position. By thus gradually lowering it, the discharge takes place without creating any counter-current, thereby preventing any sudden delivery and giving full time for the floating quicksilver and amalgam to settle.

To the outside end of the pipe is attached a lever, which, by a simple device, can be operated by a hand-wheel from the top of the settler, or it can be operated by hand from the floor below. This device can be attached to settlers in use without any appreciable loss of time.

In the engraving *A* is the settler and *B* the nozzle, this nozzle having a recess, *x*, in its front part so that when the discharge pipe *C* passes through this nozzle and plays within it, it allows of packing around it, to prevent leakage. *D* is a lever fastened to the discharge pipe *C*, in front of and against the outside face of the nozzle *B*, thus keeping the packing in the recess *x*, from slipping off. The end of the lever is set into a wooden or iron bar, *E*, and fastened to it by a pin running through both lever and bar, making a swinging joint. This bar *E*, rests in a slanting position either directly upon the floor of the mill through a slot made for the purpose, or upon a suitable support expressly placed for its reception. Two rope sheaves, *a a'*, receive the rope *z*, fast at each end of the bar at *b b'*. This rope starting from the end passes along the length of the bar thence around the pulley in sheave *a*, thence at right angles around several times the shaft, *G*, back to and around the pulley *a'*, thence along the bar *E*, and fastened to the opposite end from the starting one. The upright shaft, *G*, has a hand wheel, *H*, and the lever is thus operated. Any suitable mechanical device can be used for raising the lever, of course.

IN Wood River recently, the owner of a mine having become discouraged at the outlook and continual expense, sold his claim for $150. The purchasers went down a few feet and found the ledge, and followed it on an upraise until it came within 2 ft. of the surface. At this point the ledge was 10 ft. wide and assayed $1,000 per ton. The investment of $150 can be sold for $100,000.

THE ditch and flume of the Willow Creek Gold Mining company, near Camptonville, Yuba county, are completed and the water turned on. An elevator is in place and running.

Safford District.

A representative of the Eureka *Sentinel* visited the new Safford district some days ago. The *Sentinel* says: There is no other such sligihls location on all the Pacific coast for cheap and snccessful mining. The splendid water power of the Humholdt river, capahle of driving thousands of stamps, mey he utilized at a trifling expense. The mines ere situated within two miles of the river, all the way down grade. Oree that will yield $12 to the ton can he worked at a profit. Fortnnately there are no such inferior oree in the camp. Higher grade ores largely predominate; thie is one feeture of the new district that must inspire everyone with confidence in its great valuo. Assaye from the gress roots rnnning $500 end $600 are of common occurrence. In many instances, the croppings ahove the surface go from $100 to $300 to the ton. The writer took a half dozen pieces of rock from the Contention mine, not two ft. below ground, which gave a most flattering retnrn. We forwarded these samples to Herry Rosener, San Francisco. Yesterday we received a telegram from him steting that the average was $253 in eilver, certainly rich enough for top rock. The mineral helt stretches away for a dozen miles. It seeme to he ahout 1,000 ft. wide, and is as well defined and as easily followed as Main street, Eureka. A dozen mines were being vigorously worked at the time of our visit, and ail held ont the hrightest promises. We may say deliherately and candidly that Safford district presents a better showing on top, of rich mineral and hold outcrop, than any other locality in the State of Nevada. Thie mnch cannot he gainsaid. Whether the mines go down is a qnestion to he determined by futnre development. We believe they do. The evidences in support of thie conclusion are ahnndant and cen hardly misleed the experienced eye. It is in accord with our ohservations in the mining districts of this State that the size of the outcrop ie generally a feir index of the dimensione of the ore bodies when depth ie attained. In this particular Safford has the call over any mining section on the coest, not excepting the famone Comstock. The more prominent mines visited were the Onondaga, Contention, Illinois and Bull'e Heed. The latter hes a shaft 30 ft. deep and going down es fast ee three men could sink it. The Illinois was being industriously worked by Tom Jewell and his pertners. A ehaft had just heen started on the Contention. Many other cleims had made a stert, but we cannot go into details. A general opinion of the district ie all we thought of giving. That we were more than favorably impressed with its outlook, is already indicated in the foregoing. The chief development had heen made on the Onondaga. Here is disclosed an immense mass of good ore. Its extent ie not yet ascertained, bnt it is certainly very great. A tnnnel penetretee the body for a distance of 50 ft. and the end is not yet. We believe the Onondega will prove a great mine, and if it does there will he many other valnahle properties in the district. The contemplated town and ell else depends upon the mine. It will take a little time to settle definitely the permanency of the minss, thongh at present writing the weight of opinion is in their favor. Deputy County Surveyor Merry was husy as a nailer making surveys for the mines. He had eurveyed and merked the boundaries of the following claims: Nob Hill, Lodi, St. Julien, Watkins, Seminole, Oversight, Wallace, Belle of the Hill, Neet Egg, Mary Ann, Star, Cumberland, Albert, Griffin, Eureka. Onondega, Good Luck, Kentuck, Emma, C. & C., Comet, Illinois, Franlin, Bull's Head, Zanola, Flower Pot, Belcher, Contention, State of Meine, Pocahontes, Oneida, Grand View and Hunter's Find.

A NEW LUBRICATOR.—To produce within an oil box a constant pressure which shall insure a nniform consumption of viecous or consistent lubricants, Tovote hae designed a new lubricator. Throngh the cover of the hox, which has a verticel tuhe passing through it, another tuhe fitting closely, carrying a piston at the lower end, is inserted, which, by the constant jarring of rnnning mechinery, is made to exert continual pressure upon the unguent. The hollow piston-rod is loaded with shot to obtain the reqnisite pressure, determined by experiment. Once weighted with the proper load, the hox requirss no further attention nntil emptied, which need not occur more frequently than once in eight weeks, using a 3-inch journal. Extended experiments with textile machinery gave the following results: A 13-inch journal, making 21 revolntions per minute, required 45 ounces of oil in 48 days, while in the eame period but 3½ ouncee of grease were sufficient to do the same work. With a 4-inch journal still more favorable results were obtained; thie with 90 revolutions per minnte required 38 ounces of oil in 42 daye, while hut 0.35 onncee of grease answered the eame purpose when using Tovote'e lubricator. This device could not, however, and for obvions reasons, he used on mechaniem which revolves —*i. e.*, eccentrics, etc.—but in thoee cases the lubricator would he placed on the etrap, or some other relatively fixed member. In stationary machinery this device ie of particular advantage, as sufficient unguent could he supplied to last several months; the position of the piston-rod above the box cover would be a visible gnage of the quantity of material in the hox at any time.

The Carbonate Camp in the Black Hills.

The Black Hills *Miner* says: In cass our friends ahroad may think the carhonate camp which attracted so much attention a few weeks ego bas gone up like a rocket and come down like a stick, we will inform them, although the stampede ie ahont over and the temporary creze about ended, the camp is not played out by any manner of means. Many who deserted ell to get thee firet, as ie the cese in all etampedes, were mere surface prospectors, who lahor theoretically in their fervent imaginations. Practically, they did nothing bnt sit aronnd, dream of weelth, and coneume their provisions. The workers who meke mining camps, and in fact any other country, are etill toiling and developing their propertiee as far ee their means will permit them. On nearly ell the substantial claime the work needful to hold them for a year hee heen done. Meny who would remein there to develop their cleims have heen compelled to suspend operations until they work for another grub stake. Those who are ahle still continue their work. The opinion of an individuel who knowe nothing of mining ie of no greet value either for or against any conntry. Many who know nothing of the cemp, and have taken no trouble to ascertain the trnth are endeavoring to belittle it. So far as the country is concerned, it is a matter of little importance what they say. There is not the ehadow of a donbt carbonates are there; the float rock can he found for miles over the entire district; one or two mines have struck ore bodies from which they are taking mineral, and we are only waiting for emelters to reduce it. The majority of the claims heve just as good indicetions, hut they have not sunk on them deep enongh to discover the ore hody. The deepest mine there is not over 50 ft.; it would be strange indeed if the ore lay on top of the gronnd. The cerhonete of excitement wes the outgrowth of a legitimate discovery, and not a frandulent speculetion for the benefit of any clique or town. We have neither wanted nor encouraged the investment of ontside cepital. If there is anything in the camp, and there ie every evidence there is, thie city and the enrrounding camps will he the firet benefited by it, es they have invested their own cepital; if not, they are the only losers. We hegin to feel now as if we were not particular whether cepital came in to help us develop the conntry or not. We have toiled painfully on, knowing we had a good country, and have worked, hurdened by a thousand discouragements, nntil we oen now begin to eee our way clear. The mines which we were willing a year or two ago to sell for a eong are beginning to pay. We are heginning to reelize the wealth we knew we had if we could only get at it. We have developed minee in many instancee hecause they were too valnehle to throw away; we could not sell, there wee no capital in the conntry for thet purpose, and we had to work to hold them. In the next yeer or two meny a prospector will blees the poverty thet prevented him leaving here, the pareimony which kept the money in the pockete of capitalists who might have had hie mines, and the hard fate which compelled him to work his leeds, wherein lay hie fortnne.

REMOVAL OF THE MECHANICS' PAVILION.—The Mechanics' Pavilion, which has for many yeers occupied the site on the northeast corner of Mission and Eighth etreets, is to he at once torn down. The material will be employed in the erection of the new Pavilion on the block hounded hy Larkin, Hayes, Grove and Polk streets, opposite the new City Hall. The new Pavilion will be prectically the same as the old one, ae the latter will be taken apart in euch a way that the materiel can be pnt together again withont change. The Pavilion will he ehortened on the new eite, partly to conform with the needs of the Institute eo fer as the indnstrial fairs are concerned, and partly to accommodate a row of honses now fronting on Hayes street, which the Mechenics' Institute does not at present intend to disturb, as they bring a monthly rental of $400. It is also intended to heve the building ready for occnpancy next Christmas, when a fitting entertainment will probably he held. It will be placed on the lot in euch a manner that a brick fire-wall can be hnilt ontside of the frame, which will convert .the present temporary etructnre into a permanent earthquake-proof huilding.

WHITE PINE.—Over around Hamilton—eo we learn from parties in from there—the mining outlook appears brighter. It is now conceded as almost certain that Superintendent Kendall hae effected the sale and consolidation of the Ward Beecher, Edgar and Jennie A mines, and the California mill, with all the water privilegee attached thereto. The purchasers are London capitalists, ane they are now only waiting to get transcripts of titlee to the property before paying over the coin and assuming control. They will, it is said, commence active operations thie fall. We hope that the the more than Christian faith and fidelity of onr friends over there may eoon receive their reward, by the revival of its mining prosperity. Taken as a whole, the outlook, present and prospective, of the mining intereste of onr country appears brighter to-day than at any time within the pest fonr years.—*White Pine News.*

Placers in the Black Hills.

The Black Hills *Times* says: When the dry washer, as it is celled, is perfected, or any msthod in fect, whereby placers can he worked without water, then almost every foot of ground in the Hille can be worked, as fine gold is found everywherc. The gulches in the immediate vicinity of Deadwood have all been worked as far as known, althongh gold may still remain in nnexpected places in some of them. It ie impossihle to locate the exect position of the precioue metal, as gold is where you find it, and it hae heen found in apparently the moet nnexpected places. Mining history is full of surprises of that kind. Too much of a good thing ie good for nothing. Although it is imposeihle to mine without water, too mnch of it is worse, if possihle, than none at all. Rich minee on Castle creek had to he ahendoned for this reason, although a machine is now in operation which it is claimed could hendle the original delnge with profit. Decidedly the richest plecer minee fonnd in the hille are located in the Beer Gulch district, which inclndee a nnmber of gulches, known as Potato gulch, so named hecanse no potetoee are there, likely, Nigger, Beaver, Bear, Maloney, Send, and a number of smaller places, namee unknown, if they have any. The "Bear" country eeems to he the very center of the rich placer country, bnt unfortnnately there is hut little water. A sluice head of the precious fluid is aveilable about two monthe in the year only; after that the miners have to retnrn to firet principles, and rock out the precious dust. Notwithstending the difficnlty in working, the claime are said to have produced within the last five years $600,000, and millions more are in the ground, which will have to remein there nntil water can he procnred. The Spearfish *Register* says that Sand creek hes en ahundance of watsr, hut what ie known as the falls has alwaye interfered with mining in this gulch. These fells coneist of a ledge of rocke thrown acrose the streem, some 50 ft. in hight, form a naturel dam which hae exieted for ages, perhaps (thousande of years. The washings of not only Sand, hut Malory, Spotted Tail and many other smaller gulches have emptied their precious metals into thie reservoir for countless ages, almost. It has heen long known thet if this reservoir could he dreined, gold literally by the bushel would rewerd the promotere of the enterprise. Mr. Johnston, of the *Register*, nearly five yeere ago saw that in time capital wonld take hold of thie enterprise, and during all tbe years since has heen quietly picking up cleims on the ground referred to until he owned 28 or neerly 9,000 ft. of the very cream of Sand creek. This spring Mr. Johnson indnced cepitalists to teke hold of the matter. All summer a force of men have been hlasting a cenal some 18 ft. wide through the ledge or fall of rocke referred to.

Several of our solid men are interested in thie entsrprise, and we heve no douht their rewerd will he all they anticipate, as success seems assured. Nearly all the nuggets of any size have come from that country, and we have no douht meny more remein to be found.

Casa Grande District.

Thie district from which emall lots of very rich rock heve heen shipped dnring the lest eight months to San Francisco, where it was redneed, giving very handsome returns, is ahout to enter upon a new era of greet prosperity. Heretofore the greatest drawheck was a lack of water. Mr. Jerry Freyer, one of the pertiee most largely intereeted in the mines of the district, came near dying a few monthe ago from thirst and heet; in the district he hae recently etruck a good flow of water near the eurface. Now the last ohstacle to the development of mines in this promising district has heen removed, and we learn that a force of minere will be permanently at work,

Taking Out Rich Ore

From the minse of Mr. Freyer, in thet district, which is one of the hset mineral sections in the Territory. Col. Bredy and Judge Walker have heen engaged all eummer taking out ore and shipping it to San Francisco, which has worked $200 to the ton. The mines of these gentlemen are located a few miles from those of Mr. Freyer. At these claims water can he had hy sinking 8 ft. The discovery of an ahnndant eupply of water in Casa Grande district proves conclusively that water exists in much larger supply in the Territory than is generally snpposed, and that miners should not be disheartened ahout water nntil a systematic effort ie made to secnre it. In Castle Dome district miners packed water on hnrros a distance of 15 miles, for over 12 months, and hy accident it hecamo necessary to sink a hole in the camp, and hefore they had gone 4 ft., a splendid snpply of good water was found. We believe it can he secured in moet eections of the Territory if persone will only make an effort to find it.—*Arizona Journal.*

A CORRESPONDENT of the New York *Sun* writes as follows of the minee of Lumpkin county (Ga.): I fonnd that good resnlts have followed every well-directed effort, and wonder why these gold fields have heen so long neglected. I cannot say there are any big bonanzas there, as no work has been done on a scale to warrant large returns. The fields are as rich, if not richer than those of California, and the ore, though of low grade, is houndless in extent, and can he mined and milled at from 20 to 40 cents per ton.

Iron in Plumas County.

The Gresnville (Plumas county) *Bulletin* says: Now that there is a rsesonahls essurance of a railroed bsing huilt from Reno into this neighhorhood, the value of the deposits of iron ore in Plnmee county hecomes a subject of much importence. The value of iron, as compared with gold, is so small that, in a gold-producing conntry like this, people are not likely to think iron mining and menufactnring can he of any consequence to us at all. Pennsylvanie derives more wealth from her iron than California from her gold. St. Louis is dependent, in great measnre, npon Iron mountein for her prosperity. New York State owes much of her greatness to her iron mines. The same is true of Michigan and New Jersey. Sweden is a prosperone nation; withont her iron mines she would be next to nothing. Gold must alweys he the chief mineral weelth of Californie; anything that will lessen the cost of machinery will increase the production of gold. Pig iron now costs $72.50 a ton, leid down in Greenville. Fourteen yeere ago it was estimated that iron could he made in Plumas connty for $40 a ton; it could he made cheeper now than at that time. Would the iron made here he as good as that imported? Ie there ore enough, as well es fuel or flnx, to jnstify the erection of works? In answer to the first question, the celebrated German geologist, Beron Richthofen, said:

"Your minee cen hoast of the beet quality of iron ore which is known to exist. They consist eltogether of megnetic iron ore, the same from which the celebrated Swedish and Russien iron is manufactured. * * * None of those euhstences which, hy the emallest admixture, deteriorate the quality of iron (such as phosphorus or enlphur), appear to be preeent." To the second queetion, "Ie there enough?" he eaye: "One million four hundred thousand tone can he got by opeu quarrying in Gold valley alone." And for fuel, "the vicinity offere en almoet unlimited supply of charcoal by the extent of forests of pine end spruce." Speaking of flux, he says: "The ore is a mixture of pure megnetic iron ore with carhonete of lime, which improves the ore hy serving as a flux. * * * Limestone, which altogether is rether of rere occnrrence in the Sierra Nevada, is fonnd in Gold valley, closely accompenying the oree of iron." On the water snpply, he says: "Water is abundent the year round, being afforded hy numerone small streams emptying into Gold valley." The mining and manufacturing of iron nscessarily employs a great dcal of lahor. Should this projeot be carried out, it would, to a certeinty, increase the population, husiness end wealth of the county enormously. Thongh not a single ton of the iron made should go to the Secremento velley, onr own county, together with Sierra, Placer, Butte and Nevada countiee, ae well as the State of Neveda, wonld give a market for vast qnantities, and where no successful competition conld be made. We firmly helieve the manufacture of iron will he established in Plumas conty in the not distent future. Wheu it is, we will enter on a cereer of prosperity such as few now imegine. Then a railroad to Orovillo will he huilt, hecauss it will he an aheolute nececsity.

HARDINESS OF PALMS.—Our palm growers may be interested in a note on the effect of frost on two epecies of chamœrope which we find in an Englieh exchange. Commenting on recent ohservation in France it saye that of all the palms, *Chamærops excelsa* is the hardiest. *C. humilis*, which is indigenons in the south of Europe, and grows well at Montpelier, ie very hardy when adult, hnt tender in the young state. Side hy side, heds of young plants of *C. humilis* and of *C. excelsa*, of one or two yeare' growth, each plant having three or four emall leaves, were exposed to a severe frost in Jannary last (therm. 10° Fahr.); all thoee of *C. humilis* were destroyed, while those of *C. excelsa* were unhurt. Adult plants of *C. humilis* were not injured. Thie ie a lower temperatnre than may be expected in most parte of California. We have yonng plants of these two species in our garden in Berkeley which were not injured last winter. We lost a *Corypha Australis* but a *Latania Bourbonica* did not snccnmb, although it has put forth rather sickly colored leaves this summer.

A NEW CRUCIBLE FOR PRODUCING ZINC.—Mr. A. Landsberg, near Aix-la-Chapelle, has recently invented a new crucible for producing zinc from pnre oxides, or such as are mixed with other metallic oxides. Almost universally, at the present day, crucibles for producing ziuc by reduction and distillation of roasted hlende or calcined ore, when pure or mixed with other metallic oxides, are made of fire-clay, although crucihlee made of a mixture of graphite and clay have been experimented upon with partial euccess. Those made of fire-clay are destroyed on the insine by the combination of the eilicate of alumina, and with the materials heated in them forming various eilicates. The cruichles made of graphite and clay are destroyed externally as the fire hurns out the graphite. The new method consists of making the crucible of two layers closely united; the outer is composed of fire-clay resisting the heat; the inner is made of graphite and clay resisting chemical action. Each is a protective covering for the other. Charcoal, coke or mineral coal may he snhstitnted for graphite.

MECHANICAL PROGRESS.

Mechanical Applications of Electricity.

At the late meeting of the "British Association" as it is familiarly called, one of the speakers took up the question of the mechanical applications of electricity, which he discussed in a most interesting and instructive manner. He remarked that many people looked upon electricity as a panacea for all mechanical deficiencies; as our greatest dependence in the future for the production and application of mechanical power. In discussing this possibility the speaker proceeded to say:—

The difference between heat and electricity in their modes of mechanical action is very wide. Heat acts by expansion of volume, which we know to be a necessarily wasteful principle, while electricity operates by attraction and repulsion, and thus produces motion in a manner which is subject to no greater loss of effect than attends the motive action of gravity, as exemplified in the ponderable application of falling water in hydraulic machines. If, then, we could produce electricity with the same facility and economy as heat, the gain would be enormous; but this—as yet, at least—we cannot do.

At present by far the cheapest method of generating electricity is by the dynamic process. Instead of beginning with electricity to produce power, we begin with power to produce electricity. As a secondary motor, an electric engine may, and assuredly will, play an important part in future applications of power, but our present inquiry relates to a primary and not a secondary employment of electricity.

Thus we are brought to the question, from what source, other than mechanical action, can we hope to obtain a supply of electricity sufficiently cheap and abundant to enable it to take the place of heat as a motive energy? It is commonly said that we know so little of the nature of electricity that it is impossible to set bounds to the means of obtaining it, but ignorance is as likely to mislead in the direction of exaggerated expectation as in that of incredulity. It may be freely admitted that the nature of electricity is much less understood than that of heat; but we know that the two are very nearly allied.

The doctrine that heat consists of internal motion of molecules, may be accepted with almost absolute certainty of its truth. The old idea of heat being a separate entity is no longer held, except by those who prefer the fallacious evidence of their senses to the demonstrations of science. So also the idea of electricity having a separate existence from tangible matter must be discarded, and we are justified in concluding that it is merely a strained or tensional condition of the molecules of matter. Although electricity is more prone to pass into heat than heat into electricity, yet we know that they are mutually convertible. In short, I need scarcely remind you that according to that magnificent generalization of modern times, so pregnant with great consequences, and for which we are indebted to many illustrious investigators, we now know that heat, electricity, and mechanical action, are all equivalent and transposable forms of energy, of which motion is the essence.

To take a cursory view of our available sources of energy, we have, firstly, the direct heating power of the sun's rays which, as yet, we have not succeeded in applying to motive purposes. Secondly, we have water power, wind power and tidal power, all depending on influences lying outside of our planet. And thirdly, we have chemical attraction or affinity. Beyond these there is nothing worth naming. Of the radiant heat of the sun I shall have to speak hereafter, and bearing in mind that we are in search of electricity as a *cause*, and not an *effect*, or motive power, we may pass over the dynamical agencies comprised under the second head, and direct our attention to chemical affinity as the sole remaining source of energy available for our purpose.

At present we derive motive power from chemical attraction through the medium of heat only, and the question is, can we, with advantage, draw upon the same source through the medium of electricity?

In discussing this proposition the speaker proceeded in the usual way to show the difference in cost between the use of coal and zinc for producing energy, and concluded with the idea that in the absence of water power for the production of electrical energy, we must eventually resort to the principle of the thermal battery, and by that means utilize the sun's heat, which, in tropical countries, is equivalent to 4,000 horse-power over every acre of surface. In dealing with the sun's heat we could afford to be wasteful. Waste of coal means waste of money; but the sun's heat is passed out in endless profusion. The speaker closed his most interesting address as follows:—

"In conclusion, I may observe that we can scarcely sufficiently admire the profound investigations which have revealed to us the strict dynamical relation of heat and electricity to outward mechanical motion. Up to this time our knowledge of energy is almost confined to its inorganic aspect. Of its physiological action we remain in deep ignorance, and as we may expect to derive much valuable guidance from a knowledge of Nature's methods of dealing with energy in her wondrous mechanism, it is to be hoped that future research will be directed to the elucidation of that branch of science which as yet has not even a name, but which I may provisionally term 'Animal Energetics.'"

Mechanical Air Navigation Possible.

Notwithstanding the numerous ineffectual attempts in this city to produce a machine that will navigate the air and be subject to the will of the pilot, the thing has been successfully accomplished elsewhere. The Boston *Journal of Commerce*, in a recent number, gives the following:

Four years ago Charles F. Ritchell of Bridgeport, Conn., made some public exhibitions with an air-sailing contrivance that attracted considerable attention at the time, from the fact that his machine could be absolutely governed in ascent and descent by mechanical means, independent of a levitating gas, and relatively directed in a horizontal course. At that time, in a trial made at Hartford, Conn., his machine, as witnessed by the writer, went to a height, perpendicularly with the level of the ground, of at least 300 ft., passed eastwardly over the Connecticut river, turned about and came back to the point of starting, and landed at the feet of the gentlemen who, as a committee, witnessed the ascent.

The next day the apparatus was sent up when a considerable breeze was stirring. The operator took his car up to a line of moving air that carried him away a distance of nearly nine miles. But, working his way down, he was able to descend into a door yard, call for and obtain a glass of water, and then re-ascend, but was unable to get back to his starting point against a breeze. In short, this trial demonstrated the fact that such a machine as that could not contend against adverse wind. But it also demonstrated that mechanical means could guide as well as propel in the air, and more, that mechanical means could be successfully employed to elevate and depress the position of the aeronaut at will.

But these experiments also proved that the limit of guiding and elevating control was confined to that of the power to be employed—which must be manual, as combining the largest amount of exerting force with the smallest amount of weight.

In the experiments made at this time the machine used was a cylindrical gas-holder, suspended horizontally over a frame bolding the aeronaut. This frame was made of hollow, thin steel pipe, combining great strength with little weight. The operator, when seated, made a weight which, with the machine, would be just about the balance in the atmosphere by the gas-holder. To ascend, the operator rotated rapidly a fan on a vertical shaft directly under the center of the contrivance, the fan acting like the propeller of a ship.

A similar propeller in front of the operator, on a horizontal shaft, produced a horizontal movement. This front propeller worked on a universal joint, so that it could be turned to face 30 degrees of the circle, or at least as much as the rudder of a vessel at sea.

It will be seen by this brief summary that the Ritchell machine could be elevated and depressed, and guided in horizontal planes by means of rapidly revolving fans—it has been demonstrated that this can be done. But the limit of action is narrow, as it is controlled by the power supplied by the operator. This power, as applied to lifting, Professor Ritchell finds, is only about 15 lbs. He now proposes to make an experimental machine carrying an engine, to be fed with compressed air, which will furnish available power to lift a very much larger weight and more perfectly control the lateral movements of the machine. He is at work on it now, and when completed it will be exhibited in some large hall or in connection with some exhibition that has sufficient tent area to give room and exclude wind.

THE *Moniteur Industriel* describes a new covering for gutters or leaders crossing sidewalks. Heretofore these covers were plates of cast iron, the surface of which was broken by elevated ridges. Much travel, however, wore these plates quite smooth and polished, making them dangerous to tread upon. The government of the city of Paris is now laying new covers, which are cast with a ridge around the edges, forming a font or basin, which is filled with bitumen or asphalt flush with the sidewalk; this leaves but two narrow ridges of metal exposed, which give no trouble. Throughout the Rue Richelieu these covers have been placed, and the city is introducing them in the Rue Montmartre.

MOLDING CAST STEEL WITHOUT BORAX.—A correspondent of the *Blacksmith and Wheelwright* offers the following recipe for welding steel without borax, which he desires some of his brother smiths to try: Copperas, 2 ozs.; saltpeter, 1 oz; common salt, 6 ozs.; black oxide of manganese, 1 oz.; prussiate of potash, 1 oz. All should be pulverized and mixed with 3 lbs. of nice welding sand. With this preparation welding can be done at a cherry heat.

SCIENTIFIC PROGRESS.

Magnets Identical in Strength.

For some time past, M. Trouve, the eminent Parisian instrument maker, has been engaged in discovering the best mode of making powerful magnets of identical strength. For this purpose he has investigated the best kinds of steel, the most suitable degree of temper, and the most practical and simple method of magnetization. In testing the different kinds of steel, he cut the pieces of the same dimensions and magnetized them, then measured their portative force. They were afterward tempered and magnetized anew. The portative force, after this second magnetization, has led M. Trouve to the conclusion that the best French steel for making bar magnets is that of Allevard, as already known. He also finds that the portative forces, as determined after the two magnetizations, are connected by a simple law which can be expressed by saying that they are to each other in the ratio of $n : n^2$ —that is to say, if the portative force of the first magnetization is represented by 2, 3, and 4, that due to the final or saturated magnetization is represented by 4, 9, and 16. As regards the temper of the steel, M. Trouve finds that a regular temper is necessary, and to insure this condition he employs a muffle furnace heated by gas to a constant temperature. The actual magnetization of the bars is performed by placing them in two solenoids in juxtaposition, and closing the magnetic circuit by means of two plates of soft iron. The solenoids are then electrified by means of the current from six Wollaston elements. By proceeding in this manner, M. Trouve succeeds in preparing bar magnets which will sustain from 12 to 14 times their own weight, and if they are bent into horseshoe form the portative force is quadrupled—that is to say, it becomes 48 to 56 times the weight of the magnet.

EARTHQUAKE SHOCKS IN DEEP MINES.—It has been frequently stated that earthquake shocks are seldom felt at any great depth beneath the surface, as in deep mines. This reported fact has given much hold to the electric theory of earthquakes, under which the earth would not be supposed to be disturbed at any considerable depth. But the following item, clipped from a late English paper, puts quite a different face on the matter: "A severe shock of earthquake is reported to have been experienced in the mining district of Teversal, in Nottinghamshire, about noon on Friday last, (Aug. 1881.) In one of the pits belonging to the Stanton Iron Works Co., the miners were so alarmed at the shock and the accompanying noise that, thinking an explosion had occurred, they rushed to the mouth of the pit. In the Pear Tree Inn, Fackley, bricks were removed from the chimney, and the same thing was noticed in a house at Taversal. The stationmaster at the latter village, while sitting in his house, was thrown from his seat by the shock, and a quantity of plaster was detached from the ceiling. There was no explosion in the mines or other circumstance to account for the phenomena, and an upheaval of the floor of one the pits indicated that the cause of the disturbance was below the workings. One of the pits is 1,290 ft. deep. The shock traveled in a northwest direction."

A SIMPLE METHOD OF TESTING BUTTER FOR WATER.—Among other practices had recourse to for fraudulently increasing the weight of butter, the commonest and most useful to the adulterator, because not easily estimated by the purchaser, is that of incorporating it with large quantities of water. Ewin Johanson, the author of this paper, takes the average amount of water in unsophisticated butter to be 10% to 12%, and considers all above that as a fraudulent excess, and gives the following easy and quick method of testing the matter: Five g. of butter are brought into a burette graduated into $\frac{1}{10}$ c.c., and treated therein with 25 to 30 c.c. of petroleum, ether or benzine, the whole put in a warm place and often shaken, so as to dissolve the fats, and then left to settle. The solvent is then poured off from the aqueous stratum, and this latter again treated with the same quantity of petroleum, ether, or benzine, as before. When the mixture has again settled the number c.c. of water are read off, and the percentage calculated.

FOSSILIFEROUS METEORITES.—The impression of the existence of fossiliferous remains in meteorites seems to be gaining ground among scientists. Reports of such finds have already been given in these columns, and now comes Dr. Hahn, of Tuebingen, who thinks that he has discovered traces of fossils in meteorites, which belong to the siliceous division. One class of meteorites is entirely metallic; the other, containing siliceous substances, has been subjected to examination, and the doctor believes he has been able to prove that they are composed almost exclusively of fossil organisms, compares them to the detritus of coral rocks. He adds that complete forms are rarely to be met with, but elements sufficient to reconstruct them. He has succeeded in establishing the existence of about 50 species of polyps, algæ, glued together by a siliceous cement. These fossils sometimes present much resemblance to those of terrestrial origin. At present these conclusions can only be accepted as hypothesis requiring verification.

Scientific Meetings.

The 30th session of the American Association for the Advancement of Science, which was recently held at Cincinnati, was largely attended and one of much intrinsic interest in the cause of science. The papers read were many and varied, and some of them exhibited evidences of much careful investigation in the line of original research.

At the late Geographical Congress, which met at Venice, several letters of distinction and diplomas were made to the American Section for important additions which have been made during the last two or three years to the geographical knowledge of this continent.

A Congress of geologists assembled at Bologna on the 26th of September, at which all civilized countries were represented. The principal object of the congress was to confer together with the view of effecting a uniformity in the geological nomenclature of the world. The deliberations were conducted in French. We have not as yet seen any report of the proceedings.

VELOCITY OF LIGHT AND ELECTRICITY.—The probable identity of wave velocity in light and electricity has been established in various ways. Weber and Kohlrausch measured the quantity; Sir William Thompson and J. Clerk Maxwell experimented upon the electromotive force; Ayrton and Perry operated upon the electrostatic capacity. The extreme range of velocity in the various results was about 10%; the mean of all the results appear to correspond precisely with the velocity of light. The meaning of this accordance may be explained as follows: Suppose two parallel plain surfaces, each charged with a unit of positive electricity and placed at unit of distance; they will repel each other with a unit of force. Now suppose that they are both set in motion in the same direction, but remaining parallel and at the same distance; they will produce the effects of two parallel currents of the same kind and will exert a mutual attraction which will increase with the velocity of motion. It is possible to conceive of a velocity such that the attraction resulting from the motion will exactly counterbalance the repulsion which arises from the similitude of electricity; this velocity is precisely that of light.—*La Lumiere Electrique.*

A NEW MALARIA PARASITE.—Prof. Laveran, of the medical school of Valde-Grase, has just published a work describing what he considers to be a new parasite which he has found in the blood of persons affected with malarial fever. A notice of his discovery was communicated to the Academy of Medicine so long ago as November, 1880, but it seems to have attracted little attention, being thought to be simply one of the numerous announcements made of late years, of the discovery of the cause of malaria, which prove in the end to have no foundation. The organism described by Prof. Laveran is a minute cell, in general appearance somewhat like a white blood corpuscle, and having like it amœboid movements. He considers it to be animal rather than vegetable in character, but for this there seem to be no sufficient grounds. The matter is one of great importance and we shall look with interest to see what the forthcoming report by Dr. Sternberg of the army, to the National Board of Health upon the supposed causes of malaria, may contain in regard to the claims of Prof. Laveran.

THE NEW HYDRO-CARBON to which we have several times alluded in these columns—the discovery of a Frenchman, and which possess many extraordinary and valuable qualities, still continues to attract the attention of scientists. It boils at 100° Fahr., gives a brilliant white light, unaccompanied by heat, and the slightest puff of wind will extinguish it in case of accidental ignition. The corner of a pocket-handkerchief or even the finger can be dipped into it, lighted and used as a temporary torch, without danger of injury. Owing to the cold produced by the rapid evaporation of the liquid, it is thought possible to make one finger serve as a taper, while sealing a letter say with the others.

A NEW mountain pass has just been discovered through the Bitter Root range of mountains. This pass presents a most excellent way for the locomotive, the maximum altitude of which is less than 4,500 ft., with approaches from both east and west upon a grade of less than 65 ft. per mile. There is no danger of snow slides. There are large quantities of the best class of timber along the route, which follows water courses nearly the whole distance from Lewiston to the summit of the pass. The discovery is considered a very important one.

SHEEP AND CATTLE VACCINATION.—M. Pasteur, who has been patiently continuing his experiments in sheep and cattle vaccination, has now announced the complete success of the work, which he has been carrying on on a large scale at a farm near Melun, France; and he believes that he has obtained a process by means of which sheep and cattle can be made wholly secure against some of the most dangerous and destructive class of maladies to which they are subject.

ELECTRIC MOTIVE POWER FROM STREET CARS. Experiments have been made in Paris to drive street cars by the use of Faures' electric accumulators. These experiments, thus far, are said to have been quite satisfactory.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Sept. 15		Week Ending Sept. 22		Week Ending Sept. 29		Week Ending Oct. 6.	
Alpha	4⅞	3.90	4½	3.95	3.80	3.60	3½	3
Alta	5	4⅞	5⅛	5	5⅛	5	5⅛	4.35
Andes	2.30	1.70	2.30	1.70	2.40	1⅞	2	1.60
Albion	1.95	1.70	1.95	1⅞	1.95	1.80	2⅛	1.90
Argenta	....	....	15c	....	5c	....	....	....
Addenda	20c	15c	20c	15c	15c	10c	15c	....
Belcher	3.30	2⅛	3.35	3	3½	2⅛	2⅛	1.85
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	16	13	15½	12½	14⅛	12⅛	14⅛	11⅛
Mullion	1.30	1	1⅛	60c	70c	65c	80c	50c
Bechtel	1	95c	90c	75c	85c	75c	80c	70c
Bel Isle	15c	....	....	....	10c	....	....	....
Bodie	9	8⅛	9⅛	8	8	7	9	6⅜
Senton	1.05	95c	1.15	1	1.10	1	1.05	75c
Bulwer	2⅜	2⅛	2⅜	....	2⅛	....	2⅛	1⅛
Boston	....	....	....	....	15c	....	5c	....
Black Hawk	20c	15c	....	....	20c	15c	10c	....
Belvidere	....	....	25c	10c	....	....	10c	....
Booker	....	....	5c	....	....	....	....	....
Caledonia	45c	30c	40c	20c	25c	20c	20c	10c
California	1.10	90c	1	95c	1.20	95c	1.10	85c
Chainge	95c	65c	90c	80c	80c	....	90c	65c
Chollar	3.20	2.40	3	2⅛	2.70	2⅛	2⅛	2.45
Confidence	5	3.80	4	3⅛	3⅛	3.60	3	....
Con Imperial	15c	10c	20c	10c	25c	10c	20c	15c
Con Virginia	2⅛	1.90	2.20	1.90	3.40	2.20	2⅛	2.40
Crown Point	1.90	1.65	1.90	1.60	1.70	1⅛	1.40	1
Columbus	....	....	....	....	25c	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1⅛	....	1	....	1	....	1.15	1
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2.15	2	2.80	2.05	2⅛	2.30	2.45	2⅛
E. Mt. Diablo	25c	20c	35c	30c	40c	25c	35c	20c
Eureka Con	27⅛	27	27⅛	27	27⅛	25⅛	25⅛	25
Exchequer	1.35	1	1.30	1	1.10	1	1.10	85c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	40c	....	30c	....	25c	10c
Golden Gate	....	....	....	....	2.80	....	....	....
Goodshaw	50c	45c	45c	....	40c	35c	40c	35c
Gould & Curry	9	7⅜	8⅜	7	8⅜	7⅜	8⅛	6⅜
Hale & Norcross	4.90	4	4.60	3.80	4.40	3.90	3.70	3
Head Center	....	....	....	....	1	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	50c	40c	50c	30c	25c	....	20c	10c
Justice	90c	70c	1.10	30c	1	90c	95c	70c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	1.80	1.60	1⅞	1⅛	2.30	2.15	2⅛	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	20c	15c	25c	15c	20c	....	20c	15c
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1⅞	....	....	....	....	....	....	....
Martin White	90c	60c	1⅛	....	2⅛	2	2.10	1⅛
McClinton	10c	5c	10c	....	5c	....	....	....
Meno	3.65	3.30	3⅜	2⅛	2⅜	2.10	3.10	2
Mexican	14⅜	11⅛	14	11	12⅜	11⅛	10⅛	8⅛
Mt. Diablo	6⅛	6	6⅜	....	6½	....	6	5⅜
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	35c	45c	65c	50c	55c	50c	50c	25c
New York	20c	15c	15c	10c	15c	....	....	....
Northern Belle	17⅞	16⅛	14⅛	11⅞	13⅛	11⅛	12	11⅛
North Noonday	....	....	....	....	....	....	30c	25c
Navajo	25c	....	35c	25c	50c	....	....	....
Occidents	1.55	1⅛	1⅜	....	1⅛	1.45	1⅛	1.30
Ophir	9⅜	7	9⅛	7⅜	9⅜	8⅛	7⅜	6
Original Keystone	....	....	....	....	....	....	....	....
Overman	2.90	2	2.95	2.55	2.80	2.15	1⅛	1.20
Oro	45c	40c	65c	55c	70c	65c	75c	70c
Paris	....	....	....	....	....	....	....	....
Potosi	3.80	3.30	4.10	3.15	3⅛	2.95	3⅛	3
Queen Bee	....	....	....	....	5c	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	3.80	3.05	3.60	2.80	3.20	2.85	3.30	2.60
Seg Belcher	9⅛	7	9⅛	9	8	....	7⅛	....
Sierra Nevada	28⅛	19⅛	28⅛	18	24⅜	20⅛	19	12⅛
Silver Hill	15c	10c	40c	3 0c	30c	20c	30c	20c
Silver King	19	17	19⅛	18⅛	18⅛	18⅛	17⅛	17
Succor	....	....	....	....	....	....	....	....
Summit	30c	25c	25c	....	25c	....	15c	....
Scorpion	2.65	1.85	2.60	1.90	2.40	2	2.10	1⅛
Solid Silver	....	....	35c	....	35c	....	45c	40c
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	40c	....	45c	....	40c	....	....	....
Tioga Con	25c	....	50c	40c	40c	....	45c	35c
Tiptop	5⅜	5⅛	6	5⅜	6	5⅛	6	....
Tuscarora	....	....	20c	....	20c	....	25c	....
Union Con	19⅛	15⅛	19⅛	13⅛	16	14⅛	14	12⅛
Utah	14⅛	11	14⅛	11⅛	12⅛	11⅛	9⅛	7⅛
Ward	....	....	2⅛	....	....	....	....	....
Wales	....	....	80c	....	....	....	....	....
Yellow Jacket	6⅛	5⅛	6	4.80	5⅛	5	4⅛	4.10

Sales at S. F. Stock Exchange.

Thursday A. M., Oct. 6.

345 Alta.....4.55@4.70
20 Alpha.....3
120 Andes.....170@1.65
180 Belcher.....1.90@1.85
385 Bullion.....60@55c
200 B & Belcher.....13½@13⅜
360 Benton.....80@75c
100 California.....95c
680 Con Virginia.....2.40@2.45
260 Chollar.....2⅛
300 Crown Point.....1@1.05
350 Con Imperial.....20@15c
50 Challenze.....90c
200 Exchequer.....90c
220 Gould & Curry.....7⅜
445 Hale & Nor.....3@3.10
260 Justice.....70@75c
50 Julia.....15@10c
200 Lady Wash.....20c
115 Mexican.....8⅛
100 New Wells Fargo.....20c
100 Ophir.....6⅜@6
750 Overman.....1.55@1.60
10 Occidental.....1.30
135 Potosi.....3
60 Savage.....3.30
410 Sierra Nevada.....13½
230 Scorpion.....1.55@1⅛
207 Utah.....7⅞@7⅜
250 Union.....12⅜@12½
130 Yellow Jacket.....4.20

AFTERNOON SESSION.

790 Albion.....2⅛
400 Belding.....20c
150 Bechtel.....75c
120 Bodie.....8
200 E Mt Diablo.....20c
70 Goodshaw.....35c
100 Holmes.....65c
50 Mt Diablo.....5½
255 Manhattan.....1⅞
880 Nono.....2.10@2.30
50 M White.....1⅞
750 Noonday.....50c
150 N Noonday.....30c
150 Northern Belle...11⅛@12
100 Navajo.....60c
700 Oro.....70c
300 Paris.....90c
100 Silver King.....18⅞@18
200 Syndicate.....35c
400 Tioga Con.....40c
200 Tuscarora.....20c

Bullion Shipments.

We qnote shipments since onr last, and sball be pleased to receive fnrther reports:

Horn Silver, September 29th, $7,500; Bullionville, 29th, $7,104; Hananer, 29th, $1,890; Great Basin, 29th, $4,330; Germania, 29th, $2,700; from Silver Reef mines for montb of Septsmber, $76,457; Germania, $6,400; Hananer, 29th, $1,865; Stormont, 29tb, $3,785; Bullion, 29th, $6,785; Northern Belle, 30th, $8,989; Bodie Con., October 3d, $7,244; Star, 3d, $3,869; Silver King, 2d, $21,000; Western, 2d, $15,081.56; Northern Belle, 3d, $6,429.29,; Standard Con., 3d, $19,168; Head Center, 4th, $7,236.

ANTHRACITE COAL.—A dispatch from Victoria, B. C., of tbe 1st inst., says: W. A. Roberts retnrned from Corrichan yesterday, and it is reported that be has discovered two large seams of anthracite coal in the monntains back of Corricban, and tbat a sack full of specimens will arrive to-morrow. The gronnd in which tbe seams are sitnated is owned by a Victoria company.

MINING SHAREHOLDERS' DIRECTORY.

Compited every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	NO.	AMT. LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Argenta M Co	Nevada	9	10	Sept 5	Oct 7	Oct 28	F M Hall	327 Pine st
Belcher M Co	Nevada	23	1 00	Sept 29	Nov 1	Nov 24	J Crockett	327 Pine st
Belle Isle M Co	Nevada	3	10	Sept 13	Oct 18	Nov 8	E M Hall	327 Pine st
Boston Con	California	2	20	Sept 15	Oct 21	Nov 12	F D Luty	330 Pine st
Bullion M Co	Nevada	21	1 00	Sept 21	Oct 28	Nov 15	J M Brazell	328 Montgomery st
Belvidere M Co	California	12	25	Sept 22	Oct 29	Nov 21	C V Hubbard	310 Pine st
Champion G & S M Co	California	9	25	Sept 19	Oct 25	Nov 15	H Burns	309 Montgomery st
Scholar M Co	Nevada	6	50	Sept 29	Sept 30	Oct 21	W E Dean	309 Montgomery st
Con Imperial	Nevada	16	10	Aug 22	Sept 27	Oct 18	W E Dean	309 Montgomery st
Con Virginia M Co	Nevada	16	30	Aug 2	Sept 24	Oct 22	A W Havens	309 Montgomery st
Crown Point G & S M Co	Nevada	45	75	Sept 7	Oct 12	Nov 2	Jas S Newlands	327 Pine st
California M Co	Nevada	2	10	Oct 4	Nov 9	Nov 30	E F Stone	206 Pine st
Caledonia M Co	Nevada	37	25	Sept 23	Nov 2	Nov 22	R Wegener	———
East Mt. Diablo	California	2	10	Sept 27	Oct 31	Nov 21	G W Fisher	324 Pine st
Eintracht G M Co	California	8	05	Sept 27	Nov 2	Nov 19	H Kuntz	209 Sansome st
Exchequer M Co	Nevada	17	25	Sept 8	Oct 12	Oct 31	C E Elliott	327 Pine st
Grand Prize M Co	Nevada	7	25	Sept 30	Nov 1	Nov 21	E M Hall	327 Pine st
Independence M Co	Nevada	8	15	Aug 25	Sept 26	Oct 17	E M Hall	327 Pine st
Juniata Con M Co	Nevada	6	04	Aug 18	Sept 19	Oct 8	C V Hubbard	310 Pine st
Julia Con M Co	Nevada	16	30	Sept 16	Oct 21	Nov 11	H A Charles	419 California st
Justice M Co	Nevada	35	25	Sept 13	Oct 18	Nov 8	R E Kelly	419 California st
Kentuck M Co	Nevada	16	50	Aug 22	Sept 26	Oct 17	A C Stuart	234 Montgomery st
Maybelle Con M Co	California	9	20	Sept 20	Oct 26	Nov 18	W J Taylor	310 Pine st
Mt Potosi M Co	Nevada	7	15	Aug 12	Sept 17	Oct 10	W J Taylor	310 Pine st
Murchie G & S M Co	Nevada	7	15	Sept 7	Oct 11	Nov 10	Wm Letts Oliver	328 Montgomery st
Mexican M Co	Nevada	17	1 00	Oct 4	Nov 8	Nov 28	C L McCoy	309 Montgomery st
Mackay & Revolution M Co	Utah	1	05	Aug 23	Sept 21	Oct 21	C C Harvey	309 California st
Ophir M Co.	Nevada	40	1 00	Sept 30	Nov 3	Nov 23	C L McCoy	309 Montgomery st
Occidental Con Gravel M Co	California	8	05	Aug 22	Oct 3	Oct 26	W T Smith	414 California st
Potosi M Co	Nevada	6	50	Aug 29	Oct 4	Oct 25	W E Dean	309 Montgomery st
Savage M Co	Nevada	47	50	Sept 5	Oct 7	Oct 27	E B Holmes	328 Montgomery st
Tioga Con M Co	California	14	20	Aug 16	Sept 22	Oct 12	W H Lent	309 Montgomery st
Wide Awake M Co	Arizona	14	10	Sept 16	Oct 21	Nov 12	C Hildebrandt	Bush & Kearny stt

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M Co	California	3	15	Aug 22	Sept 22	Oct 10	J M Buffington	309 California st
Alpha Hydraulic M Co	California	3	25	Aug 20	Sept 27	Oct 18	J Ireland	216 Sansome st
Bengal M Co	Arizona	1	02	Aug 31	Oct 7	Oct 29	J H Sayre	330 Pine st
Defiance G M Co	California	6	05	Aug 26	Sept 30	Oct 20	W H Lent	309 Montgomery st
New Basel Con Gravel M Co	California	—	10	Aug 25	Oct 1	Oct 20	F X Simon	525 Commercial st
North Gould & Curry G & S M Co	Nevada	1	25	July 5	Sept 15	Oct 12	M C Southard	331 Montgomery st
North Sierra Nev Co	Nevada	3	10	Sept 19	Oct 27	Nov 17	C C Harvey	309 California st
Navajo M Co	Nevada	8	25	Aug 19	Sept 22	Oct 13	J W Pew	310 Montgomery st
Oro M Co	California	9	25	Aug 16	Sept 21	Oct 12	W Stuart	320 Sansome st
Peabody G M Co	California	1	04½	Aug 31	Oct 3	Oct 21	R D Hopkins	317 Montgomery st
Santa Anita M Co	California	6	12	Sept 20	Sept 25	Oct 10	J B Titus	24 Kearny st
South Hite M Co	California	2	10	Sept 1	Oct 5	Oct 29	T A Berlin	515 California st
Spaulding G & S M Co	California	2	10	June 28	Sept 23	Oct 21	J W Pew	310 Pine st
University G M Co	California	9	10	Aug 15	Sept 20	Oct 12	Wm. L Oliver	328 Montgomery st
Western Home Con M Co	Idaho	2	05	Aug 16	Sept 26	Oct 26	A Halsey	328 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Eureka Con	Nevada	W W Traylor	309 Montgomery st	Annual	Oct 17
Golden Gate Con	California	J T McGeoghegan	318 Pine st	Annual	Oct 8
Happy Valley G M Co	California	D M Kent	330 Pine st	Annual	Oct 24
Red Cloud M Co	Nevada	W J Taylor	310 Pine st	Annual	Oct 12
Syndicate M Co	Nevada	J Stadfeld	419 California st	Annual	Oct 20
Silver West M Co	Nevada	F R Bunker	424 Montgomery st		

LATEST DIVIDENDS—WITHIN THREE MONTHS

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Sept 27
Father De Smet M Co	Dakota	H Dean	New York	50	Sept 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Sept 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Sept 15
Silver King M Co	Arizona	J Nash	315 California st	25	Sept 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Sept 12
Tip Top M Co	Arizona	H Deas	309 Montgomery st	20	Aug 25
Western M Co	California	C S Curtiss	309 Montgomery st	75	Sept 10

The Mining Share Market.

Stocks have only been fairly active during tbe week. People do not seem to know what to make of] Sierra Nevada, wbether to pnt any faith in it or not. The Virginia *Enterprise* says:

It is quite evident that tbe Sierra Nevada company are now in a fertile and highly mineralized portion of the vein. They are cutting seams and stringers of ore in all directions, and tbey will be greatly ont of luck in case none of these shall lead to snbstantial bodies of ore. Wbere there are feeders tbere must be something to feed, They are in a section where are seen the heaviest croppings on the Comstock, tberefore it is bnt reasonable to expect something below in a place where sucb a great upheaval is to be seen on the snrface. If they have not now fonnd wbat they have been looking for they are not far away from it, for of late the "plot has been rapidly thickening."

The face of tbe east crosscnt from the 2700 station is intensely hot. Hot water pours down from tbe roof and spnrts in from the sides. The thermometer shows a temperatnre of 124 degrees. It is necessary to keep a stream of cold water continually playing upon the men at tbe drill, and every piece of iron and stecl becomes so hot as to give pain to the band tbat grasps it. Yet, nnder all tbese disadvantages, pretty fair progress is being made. In order as soon as possible to get air throngb this part of the mine, the west drift from the 2700 station of tbe joint Sierra Nevada and Union Con. winze is being pnsbed ahead as fast as powder and mnscle can send it.

This will be a very important connection, as it will allow of the resnmption of exploring operations at tbe winze and otber important points.

The bonanza mines are now fast cooling off. Tbe new snction fan is doing good work. Operations have been resnmed at most of tbe important points, and soon all will be going on as nsual.

At the middle mines matters are at present at a stand on acconnt of beat, but arrangements will soon be made whereby operations may be resumed at tbe leading points. It is expected that tbe extraction of ore from tbe 1640 level of the Savage will soon be commenced.

THROUGH the columns of tbe *Sun*, parties in New York are proposing to organize a colony to go to California or some Southern State. One writer says: "I send my address, with a view of organizing a colony to go ont next spring and take np a good location either in northern Georgia or sontbern California, or elsewbere, as shall be voted. The Anabeim colony from San Francisco bas been conspicuonsly a success, and there is an nnbonnded field for many such colonies."

BONANZA SUIT.—Metcalf Pratt has commenced suit in the District Court against tbe California mining company for the recovery of three-twentietbs of $30,600,000. The p'aintiff alleges tbat in common witb Jas. Walsh, Jos. Woodwortb, J. W. Hastings and Geo. Wilson, be was in possession of one-fourth of the ground oow known as belonging to tbe California mining company in 1859; that tbe interest of plaintiff was one-fifth; that be subsequently sold one-twentieth of five one-bnndredths of tbe ground, and that he still holds three-twentieths of fifteen one-bundredths of one-fourth of the grond. The complaint goes on to state that tbe California mining company has taken out and mined ores to tbe value of $30,000,000 from the ground in question, and tbat he (tbe plaintiff) bas never received his proportion of this amount nor any part of it. He now invokes the power of the law to compel an accontting "in whatsoever sum may be fonnd dne." The papers in the snit were filed witb the County Clerk by Lewis & Deal, attorneys for the plaintiff, on the 24th inst.—*Territorial Enterprise.*

AN ACCIDENTAL RICH STRIKE.—We see by tbe Wood River *Miner* that the latest "rush" is to the North Fork, about 15 miles above Ketchnm, where a ledge 2½ ft. wide, of milling ore that assays np in the thousands, was discovered about 10 days ago. The discovery purely accidental. A prospector slipped from a ledge of overhanging rock into the water. In crawling on to the bank, he saw native silver and copper stains protrnding from a crevice. A few minutes' work proved the existence of a ledge. Several "extensions" of the find are already recorded.

THE debt statement shows a decrease of the public debt dnring Septemher of $17,483,641. The casb in the Treasury is $250,686,547; gold certificates, $5,248,920; silver certificates, $64,-149,910; certi6cates of deposit outstanding, $8,-315,000; fnnding certificates, $636,950; legal tenders ontstanding, $346,681.016; fractional currency outstanding, $7,098,506.

THE family of Samnel Hamlin of Yuba City partook rather freely of new almonds tbe other day, and all the family, except the father, were taken violently ill, and were only relieved by vomiting and purging. Their experience may be a warning to others witb reference to eating undried almonds.

MESSRS. FARNHAM & GROVES, owners in tbe rich Rainbow quartz mine, visited Downieville lately. Over $200,000 has already been taken from this mine with a hand mortar.

THE antimony mine in tbe McCleod district, San Bsnito is doing well.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MEDIAN.—Amador *Ledger*, Oct. 1: The shaft is down 100 ft, with a ledge 6 ft in width at the bottom. Not a doubt is entertained as to the paying character of the ore. The owners have sent for a patent whim from San Francisco to facilitate the hoisting of rock. This was shipped last Friday, and has probably reached its destination ere this. The 10-stamp mill of the Talisman, close by, has been leased, and will immediately be put in order. By the 10th of October it is expected to have the mill in running order, when employment will be given to 8 or 10 men. The Median is between the Keystone and Spring Hill mines, and is regarded in mining circles as one of the most promising properties in the county.

VOLCANO.—Cor. *Dispatch*, Oct. 1: Mining at the present time is dull, on account of the scarcity of water. However, prospecting is still being pushed ahead with vigor, and many have fully realized their most sanguine expectations. Mr. Jacob Grieshack has been engaged in mining of late. He is now running a tunnel near the Pioneer district, and has struck some very rich rock. Mr. McQuade is still continuing to extract very rich rock from his mine. The Modoc mine is looking well, and is having some very good ore crushed at Mace's mill. At the present time the Golden Gate sinking is progressing nicely, and the well-known Downs mine is making necessary preparations for the winter. Mr. Stewart's mine is yielding fine looking rock, and we think he will realize a handsome "clean-up." His mill on the Mokelumne river near his mine is running regularly. The tunnel company is making preparations for the winter, and when we can have a full supply of water to work the different mines you may expect to hear of good results.

CALAVERAS.

THE CORRAL FLAT MINE.—Calaveras *Chronicle*: About half-past one o'clock Wednesday morning, the men at work in the Corral Flat mine tapped an immense body of water. The old works in the upper part of the flat were known to be full of water, which was confined to that locality by a pillar of gravel extending across the flat. Aware of the existence of this body of water, and it being the intention from the beginning to drain it, as the drift was advanced through this body of gravel, drill holes were made in the face of the drift to give timely warning of their nearness to this body of water. While the men were at work they observed water issuing from the side of the drift near where they were working. The flow of water increasing, the men beat a hasty retreat, and not any too soon. By daylight the water had risen about 80 ft in the main shaft, being within about 50 ft of the top. Shortly after the shaft began to fill, the pump ceased to work, owing doubtless to the accumulation of mud at the bottom.

EL DORADO.

MINING IMPROVEMENTS.—*Mountain Democrat*, Sept. 27: A large and heavy 40 inch tubular boiler passed through town last Wednesday, en route for the Lyon gravel mine at Prospect Flat, where it is to be devoted to pumping and hoisting purposes on the new incline.

MARIPOSA.

THE MINES.—Mariposa *Gazette*, Oct. 1: The mines in this section are looming up once more, and the gloomy past is being foreshadowed by an eventful period in mining interest. A quantity of rock has been taken from the Bower Cave mine to the quartz crushing mill of Mr. Mast at the Martin Walling mine, which is said to prospect well.

MAJOR WILBURN has bonded his mine, called the "Kate Kearney," to two gentlemen in San Francisco for a handsome sum. They evidently mean business, for they have already employed Joe Williams and others to work in the mine. Joe Williams worked in this mine years ago, and he says it is rich. The Major is deserving of success, for he has labored upon and guarded this mine for years. The vein which is traced from the McKee mine to the Major's is all taken up. A brother of Judge Cuttings, of Chinese Camp, is here, and thinks he has a good prospect in quartz. Also, a Mr. Evans and Ham Coward are here taking a peop at quartz. Billy Tisdale is getting out some excellent ore, which Mr. Mast promises to crush for him. Phil Coulter is also getting out some good rock not far from there.

FRANK HALSTED's brother passed here a few days ago. He had a specimen of silver ore taken from a locality but few miles distant. Some rock that was taken from the Marble Spring mine and sent below assays hig.

NEVADA.

GOOD LUCK.—Nevada *Transcript*, Oct. 2: Friday night the miners working in the north crosscut of the Champion, 70 ft from the main tunnel and 1,653 ft into the ridge, struck a splendid body of ore. Shortly before noon yesterday they had advanced into the ledge a distance of 4 ft, and had not passed through it. The quartz possesses the same general characteristics as that found in the Providence. The great hight of the ridge will enable 400 ft of backs to be obtained. It is 5 years since the Champion Co. began prospecting there, and during that time they have had an expense averaging nearly $3,000 a year. In order to develop the ground it was found necessary to run a drain tunnel, which is now in over 1,600 ft through hard rock, and is one of the finest pieces of work of the kind in the State. The development made Friday night is of a character to indicate that the mine will soon be on a paying basis, and thus reimburse the stockholders for their outlay and perseverance.

ROUND MOUNTAIN DRIFT MINE.—*Transcript*, Oct. 2: The Round Mountain Drift mining company of this district has abandoned its old tunnel, excepting so far as to take out the gravel in sight. From the Yuba side of the ridge they are running into the mountain, being now in about 00 ft, where a stratum of gravel is encountered. This development is regarded as an encouraging indication that the new tunnel is going in the right direction to reach the main channel.

STRUCK A GOOD LEDGE.—John Schmidt and Charlie Gallagher, who have been prospecting recently near Monroe's ranch on the Blue Tent road, are inclined to think they have found a pretty good claim. They have taken out about 12 tons of ore from a ledge they struck, and will have it milled this week.

GOT A GOOD PROSPECT.—The Eagle quartz mine out on Gallows flat, near the Masonic cemetery, has struck a good prospect. We are glad it is so, because if anyone deserves good luck, that same is Uncle Billy Smith, the owner of the claim.

CANADA HILL.—*Transcript*, Sept. 30: The owners of the Enright ground propose to carry on both quartz and gravel mining in their claim this winter. They anticipate taking out considerable gold. Sam. Johnson has bought of Mr. Cranston a quarter interest in the Keith & Ahern quartz claim, on which hoisting works have recently been erected. This winter Hamilton McCormick proposes to run a tunnel for the ledge on the upper portion of his property. He recently took out through the incline 55 tons of ore that is stated to have paid over $50 a ton by the milling process. Nivens & Sharp, who by the way have one of the best prospects in that locality, are extending their lower tunnel along the ledge in the direction of the shaft. When they reach it, they will have over 200 ft of backs. The tunnel of the Nevada claim is being pushed forward by night and day, two shifts of men working. It has now followed the ledge about 70 ft, and the face shows well in galena and sulphurets. The owners propose to put up a mill as soon as they get the developments sufficiently advanced, which will probably be next spring.

MORE CAPITAL BEING INVESTED.—Grass Valley *Union*, Oct. 2: It is becoming more evident every day that Eastern people have faith in the permanency of the mines of

Grass Valley district. The Menlo mining company, a New York corporation, has begun very active operations here. Another company has been organized, under the laws of the State of Maine, to develop the Battle mine, near Randolph flat. Also that a New York company has bonded the Allison Ranch mine.

SIERRA.

RICH GRAVEL.—*Mountain Messenger*, Sept. 30: The Bald Mt. Ex. Co. completed their preparations for bringing down water from the Pliocene shaft last week, and 10 inches is steadily flowing into their reservoir at Forest City. In less than a week's time near 50 ounces of large sized nuggets and coarse gold have been sluiced out from the upper dump. There are 800 cartloads of gravel in the lower dump, a large portion of which is as rich, if not more so, than the best rolled out of the noted Bald Mountain. The gold is 950 fine, and worth $19 clear per ounce. Soon as the lengthy run of sluices are finished the lower dump will be cleared; and when the new iron air pipe is all received and put up in the main tunnel, 3,600 ft to the incline and gangways, the main tunnel will be turned up the ridge through the center of the channel, and gangways run to the right and left, affording constant employment to a large force of men, materially adding to the prosperity of Forest City and begin in earnest the working of the river of gold that has been demonstrated to run from the Savage and upper ridge down through the Extension and Bald Mountain to Forest City. Thus far over $3,000 has been taken out. Total assessments to date about $45,000. The lucky stockholders are showered with congratulations, and their prospect of having one of, if not *the*, richest gravel mine on the coast is as bright and promising as the golden dreams of the veteran pioneers of '49. In the rich bed of the Yuba, above Jersey bridge, that yielded from 40 to 60 pounds a day to the claim of 60 ft, at that time allowed by law for each location. Next year many locations farther up the ridge will be thoroughly developed, and are backed with ample capital.

SIERRA CITY.—Eureka Con. are still running through bedrock. Main tunnel is in about 500 ft, all but 50 ft of hard cemented gravel. Hidden Treasure Quartz M. Co., Loganville, started work last week. About 14 men will be employed. A 10-stamp mill will be put up this fall. Ore assays from $25 to $200. Last Chance Co. have their main tunnel in fine appearing blue quartz gravel, and are sinking from their main tunnel. The bedrock is pitching and fine gold is found in all the gravel prospected. The Colombo Quartz M. Co. intend running a tunnel in to reach their ledge. One thousand dollars has been expended on this property. One hundred and seventy ft of tunnel, through slate rock; rich quartz in shaft, 31 ft deep; water has forced temporary stoppage of work; all the timber is claimed from the Sierra Buttes' line to the river. Blue Gravel Co. are in 600 ft with their main tunnel. Gravel still appears well, occasionally prospecting with fine gold. No idea of the nearness of bedrock. A shaft is to be raised for air. One Thousand and One have their main tunnel in 950 ft, and are confident of striking pay with their shaft, expected to reach bedrock 16 or 20 ft below the main tunnel, 50 ft this side of the face.

PORT WINE.—Liberty & Co. are busily engaged in repairing their ditches and reservoirs for the coming season, with great anticipations. The Queen and Union are not doing much at present. The Ohio, at Wahoo, is paying very rich. Last week $1,200 was taken out. If this continues the claim will be one of the richest. Twenty men are working. Quite a number of new buildings have been constructed within the past five months, and if times continue thus prosperous, at the end of the year there will be a little town.

THE Sierra Buttes Quartz M. Co. have started tunnel, No. 9, just below the Downieville stage road, near Sierra City. The men employed in Nos. 8 and 9 reside in town, materially contributing to its prosperity. As soon as needed Burleigh drills will be used in No. 9, to be run about a mile to reach the pay ledge northwest of the Sierra Buttes. On the completion of this new enterprise and mills are put up at the lower end of the city, on the ground lately owned by Jno. Kane, this will be one of the most prosperous and liveliest mining camps in these rich gold regions.

ALLEGHANY.—The resumption of operations at the Golden Gate mine near Alleghany is adding greatly to the business interest of that section. Supt. T. Burke has a full crew of first-class men at work and is pushing developments ahead rapidly. The new hoisting and pumping machinery works smoothly. Four Fruc concentrators are being placed in the mill, which will start up in a few days and run regularly. The Golden Gate is in the same locality as the famous Rainbow mine, and we should not be surprised to hear before many weeks that Supt. Burke had uncovered a bonanza like unto the Rainbow's last one. Even should he not do so his careful and economical management ought to make the Golden Gate pan out well with the average gold-bearing rock of which it contains large quantities.

THE Sierra Buttes Quartz M. Co. stopped all their mills last Monday to afford their employees an opportunity to attend the funeral ceremonies of the late President Garfield, at Sierra City.

THE Hidden Treasure quartz ledge, at Loganville, is steadily growing richer as the work of development progresses.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.— On the 2700 level, the joint Union Con. east drift has been extended 18 ft., and the west drift on the same level 23 ft.

OPHIR.—The large fan over the Con. Virginia shaft is in successful operation and is gradually cooling off the southern portion of the mine. We shall be able to resume work jointly with the California Co. during the coming week.

YELLOW JACKET.—The north lateral drift on the 3000 level was run 38 ft; present length of same 288 ft from the switch. No change in the character of the ground. The north lateral on the 2828 level was extended 20 ft, making the present length 108 ft from the north winze.

NEW WELLS FARGO.—The south lateral drift on the 500 level is now in a distance of 50 ft. The formation still looks well.

UNION SHAFT.—Repairing the drift on the 1600 level to the Sutro tunnel connection; also, cutting out a hoh-pit at the 2600 station.

UTAH.—We are now engaged in repairing the incline. This work has been rendered necessary by the breaking of three sets of timbers below the 1300 level.

CON. VIRGINIA.—The suction fan is working successfully and cooling off the lower levels, which will enable us to resume work at the different points during the coming week.

CALIFORNIA.—The suction fan is running successfully and cooling off the lower levels, which will enable us to resume work at the different points during the coming week.

MEXICAN.—The joint Union Con. east winze on the 2500 level has been sunk and timbered 7 ft. The joint Ophir east drift on the 2000 level has been extended 36 ft.

UNION CON.—The joint Sierra Nevada east drift on the 700 level has been extended 18 ft. The joint west drift on the same level has been advanced 28 ft. On the 2500 level, the joint Mexican east winze has been sunk and timbered 7 ft.

CON. IMPERIAL.—Are putting in air pipe in Imperial and Alpha joint winze, which work is now nearly completed. Are puttinghlower in position at our south station, 2810 level, preparatory to cleaning out cross-cuts on that level.

ANDES.—During the past week drift from winze was advanced 10 ft. There is still some water coming from the face of the drift, which keeps work back a great deal. It is now slacking off, and are in hopes it may give out altogether soon.

OVERMAN.—South drift, 2275 level, has been exteuded 32 ft. In north drift we have put in 7 sets of timbers and cut 445 ft of drain.

EUREKA DISTRICT.

A BUSY PLACE.—Eureka *Sentinel*, Sept. 20: The Geddes & Bertrand mine is one of the liveliest places at the present time in these parts. There is a large force of men employed, and everything is bustle and activity. A boarding house capable of accommodating 100 men is being erected for the company. Grading is going forward for the new works, which are to be immense, the masonry for the foundation alone costing $30,000. The owners of the property have undertaken improvements which must necessarily cost several hundred thousand dollars. There is plenty of rich ore in the mine to justify the outlay. It will not be long until the Geddes & Bertrand is recognized as one of the great mining properties of Eastern Nevada.

GRANTSVILLE DISTRICT.

ALEXANDER.—Grantsville *Bonanza*, Oct. 2: Operations at the company's works have progressed satisfactorily, showing good results both in the mining and milling of ores during the week ending this date. The Alexander stopes show quite an improvement since last report. The chloride stope between levels No. 4 and 5, is getting larger and richer as developments progress. The stopes on No. 6 level, east and west of incline, look well and are turning out plenty of good ore.

THE BROOKLYN.—In the Brooklyn the west drift, No. 3 level, was advanced 28 ft since last report, making the total length 142 ft, the face of which shows good indications of nearing the No. 2 ore body. The stopes on No. 1 and 2 levels continue to look well and produce a high grade of ore.

LEWIS DISTRICT.

THE NEW MILL.—Grantsville *Bonanza*, Oct. 2: From A. J. Franklin, who recently visited Lewis district, Lander county, we learn that the new 40-stamp mill is rapidly approaching completion; all the work in and about it is being done in a thorough and systematic manner under the supervision of Mr. John P. Courter. Mr. Franklin considers it one of the best arranged and most commodious mills he ever saw, everything being so fixed as to render it as labor saving as possible. He also thinks that Lewis is destined to become a flourishing camp and an extensive shipper of bullion.

SAFFORD DISTRICT.

PROSPECTS.—Cor. Eureka *Sentinel*: The Contention, and by the way a proper adaptation of the mine, as it has proven a bone of contention ever since its discovery, looks about as usual. The bond on the same having expired a few weeks ago, the owners have concluded to try it themselves a while; although I would suggest that they allow some one with capital to develop it for them; in fact, this is the only present serious detriment to the camp, as simple post holes, in which you could not even bury your head are held at fabulous figures. It appears to be a "dog in the manger" business, and to a man up a tree it looks as though some one was trying to keep capital away from the district. The Belcher, Albert, Illinois, Eureka, Bull's Head and Good Luck appear about the same, nothing having been done worthy of mention. The Pocohontas, a valuable piece of ground adjoining the Contention and Illinois, owned by Molinelli and Smith of your city, and which must certainly sell for big figures if present developments hold out, has been much sought after by parties who are always a day too late, and after having been jumped and worked several times, it has been relinquished as often again to its proper owners, who feel thankful for the amount of work performed on the same, and at no expense to them. Mr. Rickard, formerly superintendent of the Richmond, has located a water ditch and mill site, and it appears to me that if he builds a mill here all the mines must become tributers to it, as the fall is so slight that it will only permit the working of one mill in this vicinity. It will prove a veritable bonanza to him if the district holds out. It is a strange coincidence that, although people coming here leave at first with a poor impression of the district, they return the second time to leave with more favorable opinions.

TAYLOR DISTRICT.

LOOKING UP.—White Pine *News*, Oct. 1. From W. C. Love, Esq., who returned a few days ago from a trip through the Schell Creek range, we learn that the Monitor mine at Taylor district is looking fine. The mill at Steptoe creek was started up last week and was doing good work. At the mine there is plenty of ore to keep the mill running for months, and they have a large reserve to fall back on. Monday morning they took out their first bar of bullion weighing 1,020 6-10 ounces valued at $1,204.74. The ore worked up to 85% and the bullion was 913 fine. Other bars will follow in rapid succession. Mr. Love tells us he has seen no more favorable mining property in this end of the State than the Monitor, and he considers the chances for its owners—Messrs. Lyons, Briggs and McGill—for realizing snug fortunes almost a certainty.

ARIZONA.

GLOBE DISTRICT.—*Chronicle*, Sept. 20: Through the courtesy of Supt. Spence, of the Hoosier copper mine, we were shown through this property a few days ago, and found the work of development going steadily ahead. The vastness of the ledge is proven by the numerous cuts and openings on the surface, to be a continuous vein of high grade copper ore, and second to none in the district. The shaft, which is entirely in ore, has reached a depth of 25 ft, and from it a drift has been started, which was in about 10 ft when we visited the property. It is all in good ore, and the crosscut which is being made south from the shaft has developed a width of 22 ft already, and from the surface cuts on the ledge, we feel safe in stating that it will be found fully 60 ft between the walls. As development progresses, the ore is becoming more solid and of a higher grade than formerly. The dump presents a very handsome appearance, with its 350 tons of first-class ore, and from the present showing of the mine and the immense body of ore in sight, we shall not be surprised to see the erection of a 30-ton smelter commenced at an early day. The Hoosier may safely be classed as the leading copper mines of Arizona, and its ore, averaging from 30% to 35% copper, be adding materially to the output of bullion from this district.

OLD DOMINION.—The long expected machinery for hoisting works and smelters for this property has at last reached the mines, and a large force of men are employed in the erection of the same.

CARRIS.—The smelter belonging to this property was steamed up on Tuesday morning, since which time there has been a continual outpouring of fine copper, and the bars are being piled up like cordwood.

A QUIET WEEK.—Tombstone *Epitaph*, Oct. 2: The only event of special interest during last week, was the enjoining Head Center by the Western M. Co. This step had been expected in mining circles for several months, therefore it did not create the surprise that it otherwise would have done.

SULPHURET.—Notwithstanding the present work on this mine it is more particularly designed to obtain a large water supply for our mines, and mills to be built at the mines, the same work will open up the mine to a very great depth, and is, therefore, of the utmost importance to the district. The flow of water has steadily increased since sinking began, and, notwithstanding but about 20 ft has been made, the increase has been at the rate of 1,000 gallons per foot—the flow now being 85,000 gallons every 24 hours. The shaft where begun anew is being timbered with square sets, the timbers used being 8x10. If the water continues to increase for the next 50 ft as it has for the 20 ft already sunk, the present machinery will have to be discarded and a Cornish pump substituted.

ANCHOR.—Tunnel in 135 ft, having cut and passed two veins, the one 2 ft and the other 3 ft wide, both carrying medium grade ore, have now come into a compact lime, which will probably continue to the main ledge, upon which the incline was sunk.

TOMBSTONE M. & M. Co.—The mines are all looking well and yielding the usual amount of ore. They sent 100 tons of ore to the mills from the West Side, which all came from development work during the month. The mills are running at their full capacity. Monthly output, 3,240 tons.

CONTENTION—Two new shafts on the north end of the mine have been commenced since our last report. There is nothing new to report above the 500 level. They have struck good ore on both the 500 and 600 levels, but as yet have not determined its extent. The various stopes and breasts of ore look as well as heretofore, and the usual quantity is raised and sent to the mill daily. The monthly output is 2,400 tons.

VIZINA CON.—The shaft is down 408 ft. The bottom is in a soft talcose formation that fills the entire shaft. This formation has already been the harbinger of ore in this mine. A strike of ore in this shaft will be hailed with applause by the whole community, for the reason that in the limestone formation of this portion of the district, the question has been, Will the ore go down? The various stopes and breasts are looking well and could, without exertion, be drawn on for $100,000 per month if necessary. Output for the month, 620 tons.

GRAND CENTRAL.—The old shaft is down 500 ft, and the station for that level is nearly completed. The new shaft is down 65 ft below the 200 level, and going ahead at the rate of 5 ft a day. The stopes are looking as well as heretofore. The monthly output is 2,700 tons.

FLORA MORRISON.—The mine is looking as well as heretofore. No more is being stoped out than is absolutely necessary to continue the exploration work.

HEAD CENTER.—Everything moving along smoothly around the mine. No work is being done in that part of this mine in controversy. Monthly output, 900 tons.

INGERSOLL.—The mine continues to look and yield well. Preparations are being made to mill a portion or the whole of the large dump of ore now out, which cannot be far from 1,500 tons. Monthly output about 200 tons.

STONEWALL.—The mine continues to yield as well as heretofore. Monthly output, 200 tons

COLORADO.

WILLIAM'S FORK.—*Register-Call*, Sept. 30: Yesterday the mining reporter met Mr. J. W. Dripps, who had just returned from the mines on William's Fork, Grand county. Dr. Dripps was well pleased with the outlook of the veins he visited, but claims that mining in that locality is in its infancy; that sampling works are badly needed in the new camp, and without them but little progress can be made. The work of development goes on, the ore extracted from the several lodes being piled up. A few sample lots have been transported to Georgetown with flattering results. Here is a fine field for the investment of capital in the erection of sampling works. They will pay the investors in them, besides assisting the miners to realize upon their labor, and thereby assist further development

DAKOTA.

THE COLUMBIA MILL.—Wood River *Miner*, Sept. 30: About noon to-day two 8-yoke ox teams, drawing immense pieces of machinery, came toiling slowly into town. The cry was raised that it was our new smelters, but upon investigation it was ascertained to be part of the large stamp mill of the Columbia and Beaver companies at Sawtooth. The freighters, Messrs. Darby and Coe, informed the *Miner* that they had on the boiler, roasters, fly-wheel, pans and shoes of the mill, weighing 28,000 lbs, and that the remainder of the mill will be in a few days. The machinery was manufactured at the Pacific Iron works, San Francisco, and left Kelton September 5th. It is expected that the mill be in operation this fall and run through the winter.

A FEW prospectors with their pack animals passed through town this week on their way to the south for the winter. The greater portion of those in the country have claims sufficiently rich to induce them to remain here during the cold season. All or nearly all of these claims will be developed another year, and put into a shape for selling.

IDAHO.

WOOD RIVER SMELTER.—*Miner*, Sept. 30: The Wood River Co.'s smelter, near Hailey, is running smoothly, and smelting the usual 10 to 15 tons of ore per day. Arrangements have been made for ore enough for a 20 days' run, and Mr. Wolters says that there is ore enough on the dumps in the various gulches and ravines roundabout to keep it running at least 3 months longer, if the miners will only sell their ores. The smelter now returns from 92% to 93% of the silver contained in the ores. This is 2% to 3% better than can be done in Salt Lake. The Philadelphia Co.'s smelter at Ketchum is about ready to start for a two months' run, during which it will reduce about 2,000 tons of ore. Of this quantity about 1,000 tons are already at the smelter, or on the dumps of the company's mine; 500 tons more will be extracted from those mines, and 500 tons of "custom" ore will be purchased. About the 1st of December the smelter will shut down until next April. The smelter being erected at Bellevue by E. A. Martin is also about ready. It will start up on ore from the Mundey mine, and between that, the Queen Victoria and the Minnie Moore will doubtless run until snow flies.

NATIVE SILVER.—The vein in the Mayflower and Jay Gould mines is opening up magnificently. Recently, in sinking the shaft in Mayflower ground, near the Jay Gould line, the vein widened from 6 inches to 3½ ft in sinking about 15 ft. The value of the ore also improved wonderfully, the seams in the galena being filled with wire silver. Some specimens taken out showed fully 25 cents worth of native silver. This is said to be the first time in the history of mining where native silver has been found in galena.

ITEMS.—*Democratic Times*, Sept. 30: Winter preparations are in order. Sturgis, Beckuer & Co. are still engaged in drifting on Forest creek, with favorable results. Gus. Pfeil, of Gali's creek, reports some mining still going on there, and that general preparations for winter are being made. John Cimhorsky, who has been at work on the Beaver Cinnabar Co.'s claim on Beaver creek, reports flattering prospects. Wm. Borgman last Tuesday showed us a fine nugget of gold taken out by Walter Simmons at Silver creek some time since. It weighed $102, but contained some quartz. J. F. Salmon, superintendent of the Josephine mining company, made a small test run on their quartz a short time ago, and was so encouraged that he is taking out more quartz. T. J Critzer, superintendent of the Steam Beer mine at Leland, has been making extensive improvements on their mining claims, and will be better prepared than ever to make a good run next Winter. Jas. Hansen, foreman of the Blue Gravel mine at Galice creek, is in town. From him we learn that winter preparations will soon be commenced in that camp. Work on Green Bros.' tunnel is progressing satisfactorily. Henry Klippel, Esq., returned from Squaw lake Friday evening. He finds arrangements for replacing the bulkheads in Squaw lake, and a number of men are now engaged in the work. The repairing of the ditch will also be completed at once.

PUMP.—Idaho *World*, Sept. 27: The Elmira Co. are rigging a steam pump to suck the water out of the lower level of the Crown Point. The water will be conveyed through the lower and main tunnel, 35 ft below which work is now being carried on. A three-foot seam of bluish-colored ore was struck the other day in the drift running west from the 75 level in the Sub Rosa. It is the same character of ore that was mined several years ago near the surface, and 600 tons of which milled between $25 and $30 per ton. The ore of this last strike will turn out about $20 per ton, judging from tests made in a hand mortar.

MONTANA.

ALBION.—Helena *Independent*, Sept. 20: The Albion mine, of the Bald butte group, owned by Chumasero, Chadwick & Tatem, which for a time was quiet, is now again active. At a depth of 100 ft levels have been run 150 ft along the vein disclosing a body of ore averaging about 8 ft in width, and it is estimated that developments have thrown in sight at present nearly if not quite 3,000 tons of the ore, which is safe to average at about $30 gold per ton. A contract has just been made with Messrs. Cotter & Hickey for the use of their Mount Pleasant mill for a run of 300 tons of the ore, 60 of which are now on the dump.

IRON AGE.—Mr. Courtwright, the well-known wheelwright, has offered to erect a 10-stamp mill on the Iron Age mine, and run it 2 years on the ore product, taking pay for the mill during that time out of the quartz, and allowing the owners to take the entire property afterwards, free from any obligation to him. Or, if after he has demonstrated the ability of the mine to pay under such conditions, he will allow the owners to take full possession by paying the actual cost of the mill, with a reasonable compensation for his time spent and services rendered in the development of the property.

GLOSTER.—The Boston & Montana's Gloster mine continues to display a remarkable body of ore that increases in value as development progresses, and each run shows an advance in the degree of fineness of the precious metal. The last clean-up of a 14 days' run resulted in 246 ounces of bullion, which netted nearly $3,400, the actual saving per ton in their 10 stamps being just about $15 average per ton for all ore treated since the mill started. The gold has from the run last but one, was stamped .623‰ fine, while the one last made is .631 fine in gold, or the highest grade yet produced from this mine. Fully 40,000 tons of the ore are in sight.

THE ARCTIC MINING AND MILLING CO., of Tama county, Iowa, is actively developing property in Hyora gulch, 2 miles beyond the Alta Montana's Comet mine. The company has 4 locations on what is known as the Silver Brick lode, and it is reported that between walls, 14 ft apart, the ore is solid for the entire distance. They are running a tunnel.

THE Parsell and Edgington mines of Poor Man's gulch, just over the main divide from Virginia creek, are now owned by Messrs. Holter, Sharpe and Floeder. Messrs. Edgington, Parsell, Morrill and Trent having sold their three-fourths interest. These properties have steadily improved in value, as the vein has been exposed until they bid fair to take rank very soon among the established mines in the Territory.

A NEW MINING DISTRICT.—*Inter-Mountain*, Sept. 29: From Mr. James Moffet, who has just returned from the new mining district, discovered by Mr. Frank Bosworth, about 6 miles east of Butte, on the north side of Elk Park, we learn that some 50 locations were made on and near the new find, some of which show pretty good indications. From several assays made on rock from this place the following reports are made: 109.35 ounces silver; 139.75 ounces silver, and 80 ounces silver and $2.50 in gold. The croppings in some cases are very large and the veins show a width of from 1 to 9 ft. The formation is granite and porphyry, and the rock is free milling, with some iron in it.

NEW MEXICO.

COPPER MINE SALE.—*New Southwest*: Sam'l H. Eckles, for the past two or three months, has had the handling of the group of copper mines in the Burros, known as the Colton, Hilton, Boston, St. Louis, Copper Mountain, Emma, Mary, Parker, and Anything, belonging to James M. Yankie, George Parker, James Lullard and one or two others. The mines were located by Charlie Thayer and others several years ago, and considerable money was spent on them at the time, but more recently, assessment work having been neglected, they became subject to re-location, and were taken up by the parties first named. Sometime since Mr. Eckles succeeded in inducing Paschal R. Smith and F. J. Marshall of Denver, to look upon the property favorably, and as a result of his negotiations with these gentlemen, the sale was effected for $150,000. We are reliably informed that it is the intention of the new proprietors to commence active work upon the property without delay, that a smelter of great capacity is to be erected, and that operations will be upon such a scale as to give employment to about 500 men. Of course, as these mines are situated but 18 miles west of Silver City, this must be the point of supply, and the direct and indirect advantages resulting will be enormous.

SMELTERS.—*New Mexican Mining News*: A few more smelters and stamp mills in Socorro will not do the camp any harm. The Torrence mill and the La Joya smelter will never be able to clear all of the dumps in the Socorro mountain alone, and men with no capital but a few hundred tons of rich ore cannot afford to be kept waiting.

THE miners of the Magdalena range are jubilant over the prospect of soon having a smelter on the ground. The machinery is nearly all there and is being rapidly put up. As a natural consequence mining property in that camp has greatly improved.

RISE IN VALUES—The miners in the immediate vicinity of Cerrillos station are beginning to share in the general rise in values which has recently set in throughout the camps in the Cerrillos district. The placers, near this camp have been kept back solely from lack of water and if the dry washer succeeds in dispensing with what has heretofore been indispensable in placer mining, those who are fortunate enough to own claims there will have a fortune on their hands.

RIO HONDO.—The mines at Rio Hondo are among the best in Taos county. This is comparatively a new camp, but the richness of the ore found there has been clearly proven. The Staples claim is one of the best developed, the shaft now being over 100 ft in depth. The ore taken from this lead will run about 200 ounces to the ton, which is very much above the average of that taken from mines which have yielded enormous dividends. There is now considerable expense attendant when shipping the ore to reduction works, those at Pueblo, Col., being the nearest to the camp, which, of course, materially reduces the owners' profits, but this will eventually be obviated by the erection of smelters on the ground.

THE mines of Colfax county are beginning to attract considerable attention from mining men, and the probabilities are that work will at once be begun on a number of them by parties who have command of sufficient means to thoroughly develop them. Several companies have been formed, having for their object the development of some of the best known mines in the county, and are going at the work with a rush, which will materially advance the mining interests of that section of the Territory.

MINERAL HILL.—Cor. Las Vegas *Mining World*, Oct. 1: The Golden Gate camp is located in a most delightful spot, with the Blue Canyon river sweeping by. About 100 yards distant is an immense dyke of granite, which shows itself in the bed of the creek, and extends almost to Gerard's camp, where it suddenly disappears. The first claim you see is the celebrated Carbonate Queen, Mr. Grans, proprietor. The work on this property consists of an incline driven into the mountain slope 65 ft. There are, if I may judge by the number of stakes and monuments I meet with on this side of the hill, several other claims on which scarcely anything has been done to warrant my wasting ink, with the exception of the Little Rena, Messrs. Irvine & Co., owners. This is 30 ft deep, beginning to go under cover. About one mile up the side of an almost perpendicular mountain, you come to the Little Pearl, Arnold & Co., owners. An open cut extends for about 24 ft from the face at present and is composed of float; howlders are to be met with containing arsenical sulphur, green and red sandstone, etc., largely interspersed with mica and oxide of iron. I was informed that some of this float assayed well for silver. Parties who are about to operate in this district should understand that deposits which will prove of value are not to be met with on the surface; such deposits that are formed in and near the surface are caused by displacement. A careful study of this district teaches us that if we wish to find the true deposit we are compelled to search for them in deeper or more settled stratifications.

UTAH.

THE G. K.—*Southern Utah Times*, Oct. 3: The G. K. copper mine, in Beaver Lake district, is now having an air shaft sunk upon it to a depth equal to that of the main shaft with which it will be connected. It is now down to a depth of 40 ft in ore all the way, which assays from 10% to 45% copper. Mr. Cook, the superintendent, thinks the outlook a very favorable one.

HORN SILVER.—We have lying before us a beautiful specimen of high-grade copper ore, and another of gold-bearing quartz taken a few days since out of the lowest depths of the Horn Silver mine.

It is reported that a rich placer mine with no less than 11 quartz leads, all in the same vicinity, has been discovered in Lower California, about 250 miles south of San Diego.

The Entomological Exhibit at the State Fair.

The insect exhibit at the State fair hy Matthew Cooke, State Horticultural officer, was one of the most valuahle educational features of the fair aud was duly appreciated hy the puhlic. Unfortunately it was placed in a dark corner, when it should have heen in the lightest part of the huilding. The *Record-Union* gives a review of the exhihit which will interest those who could not attend the fair:

There is no more attractive exhihit in the entire list, either at the park or pavilion, aud none more suggestive or of more vital importance to the people, than that made hy Matthew Cooke, chief executive officer of the State Horticultural Commission. It is a complete aud exhaustive exhihit, in all the various stages of their existence aud depredations, of the various insect pests which prey upon the fruits, trees aud vines of this State. The exhihit is presented through the aid of a score or more of microscopes, powerful magnifying glasses, etc. These are ranged at conveuient distances from each other aud heueath them are such specimens of the codling moth, phylloxera and a host of similar pests, as can he only examined hy microscopic aid. In additiou is an almost endless array of the "pest" specimens in vials aud jars, with examples of their destructive work in wood, leaf, fruit, berry, etc., aud showing every one of the stages of their existence. These specimens are from all parts of the State, and have heen gathered hy Mr. Cooke with great patience, to enahle him to gain a full knowledge of this branch of entomology, with a view to applying the hest remedies possihle to the extermination of the pests, which have already caused such great loss to fruit and grape growers. Some time ago a number of grammar school hoys here organized a junior Agassiz association, for the study of entomology and the collection of specimens. It proved quite successful. Mr. Cooke was invited hy the hoys to instruct them concerning insect pests, and he readily undertook to do so. He has now utilized this society hy selecting from its membership a number of the young masters, who, wearing the neat hadge of their association, stand hehind the counters, on which are arranged the microscopes and specimens in the exhihit referred to, and, having hecu instructed hy Mr. Cooke, explain to inquirers all needed details of the exhihit. The three days' experience already had, Mr. Cooke certifies, proves that the youths' association is a most desirahle aid in furthering the purposes of the exhihit, and the puhlic has heen greatly convenienced by the politeness and attentions of the hoys. The exhihit is in the lower east hall, in the southeast corner. (This exhihit should have the hest light and location in the huilding, and he on the upper floor.) The space, 30 ft. hy 14 ft., is railed in. In the center is placed tahles, in the form of a hollow parallelogram, 23 ft. hy 7 ft., giving a surface of 104 square ft. On the tahles are arranged 24 microscopes, some of them valuahle instruments, which have heen given hy their owners for use in this exhihit. There are also 36 magnifying glasses of various kinds. To the tahles are fastened hy chains 12 readiug glasses, for use hy those examining specimens. The visitors enter at one end of the tahle and pass to the right, so that there is no trouhle in the passage arouud the tahle. In the microscope and maguifying glasses are placed specimens of the various insects, and on the tahle are various hottles, etc., containing specimens, as follows:

First—The codling moth (*Carpocapsa pomonella*), which has done so much damage in this State aud elsewhere. Specimens of the egg, larva, pupa, and perfect insect (moth). Also pieces of scantling taken from fruit-packing rooms, hark of trees, paper, etc., showing how this pest hihernates.

Secoud—Scale insects (*Aspidiotus perniciosus*), or San Jose scale, which has done so much damage to orchard property in Sauta Clara couuty, aud is uow found in Solano, Yolo and Sau Joaquin. *Aspidiotus rapax*, fouud in apples, pears, etc., in Sauta Cruz and some of the southeru couuties. *Aspidiotus conchiformis*, or common apple scale, fouud in various sections of the State on deciduous fruit trees aud citrus trees. *Aspidiotus aurantii*, or red scale, fouud on citrus trees aud fruits in Los Angelea county, aud also fouud as far uorth aa Marysville. *Aspidiotus convexus*, found ou the fruit in various counties, hut especially on citrus fruit. *Leconium oleæ*, or hlack scale, found throughout the State on citrus aud nearly all kinds of deciduous fruit trees. Accompauying this species are specimens of *Fumago salicina*, or smut, which accompanies the hlack scale and discolore the foliage aud fruit. *Leconium hesperidum*, or soft orauge scale, fouud in every portiou of the State ou citrus treea. *Leconium acericoleo*, or maple scale, found on grapes in Santa Barhara aud eome other couuties. *Icerya purchasi*, or cotton cushiou scale, au Australian importation; fouud in Santa Barhara and Los Angelea; ita food plants are citrus and deciduous treee, abruhs, etc.; this appears to he a very undesirahle visitor, hy the specimeua shown. *Uhleria araucariæ*, or scale of Norfolk ialaud pine; said to he spreadiug very fast. *Diaspis roseæ*, or rose scale, with epecimena ahowing ita serioua epread ou the rasuherry and hlackberry viues. Iu all, 22 apecies of acale iusects are exhihited.

Tretranychus telarium, or red spider, in all its changes or metamorphoais. Specimeus from several couuties.

Caterpillars — *Clisio campa constricta* and *Clisio-campa* aud *Americana orgyie leuceostigma* in all forms—eggs, larvæ, pupæ moths, etc.

Selandria cerasi, or pear slug, with specimens showing its destructive hahits.

Nematis similaris, or saw-fly, destructive to foliage of pear trees early in each season.

Ægeria tipuleforme aud *Chrysobothris femorata*, currant-husb borers; also, specimens of apple-tree borers, etc.

Orauge, lemon, apple, pear, etc., iufested by scale insects aud set under glasses.

Olive branches iufested hy three distiuct species of scale insects. Lemons, from a recent shipment received from Australia, infested by A. *aurantii*, or red scale, aud *Leconium citricola*.

Collectiou of various insects more or less injurious to trees aud fruit, iucluding several species of *Diabrotica*.

The collection of vine pests, etc., is taken charge of hy J. H. Wheeler, Secretary of the State Board of Viticultural Commissiouers. This iucludes phylloxera, vine caterpillars, aud a full display of remedies for their extermination, fully described by Mr. Wheeler.

Friends of the fruit growers—This collectiou of insects is classified as "lady hirds," *coccinella*, *chrysepas*, or lace-winged flies, etc. Iu this division is exhihited a fine collectiou of parasites of the *coccidæ* or scale insects, kiudly loaned hy Alex. Craw, of Los Angeles, of which Mr. Cooke speaks highly. It cousists of syrphus flies, destroyers of plaut lice, lace-wing flies aud various parasites of the hlack scale, soft orange scale, lady bugs, etc. There is also exhihited pump-uozzles, etc., for washiug trees, scrapers, etc., for cleaniug trees. Volumes exhihited of uatural history of insects, etc.

Durability of Redwood.

The geueral desirability of our redwood timher and lumher is hecoming widely known, and is leading to a promising export trade, as we have uoted from time to time in the PRESS. It seems that the durability of the wood iu sitnations whicb lead other woods to quick decay, may he the fouudatiou of a special trade in redwood. At all events, wood of long life uuder adverse couditions is such a desirable thiug to Eastern huilders, that tbey are inquiriug the record of our redwood iu this respect. All wbo bave had to do with it here know very well tbat it has remarkable durability uudergrouud or betweeu wind aud earth. Iu order to preseut Easteru correspoudeuts an object lesson in the soundness of redwood, Fulda Bros., of Spear street, S. F., who are exporters of lumber, have just sent East a piece of oue of the posts which formed the stockade of Fort Ross in Mendocino county, accompanied hy certified statements concerning the history of the specimen, which are of geueral iuterest, and we puhlish copies of them as follows:

Messrs. Fulda Bros., S. F.:—By your request I send you, by the schooner *Euphemia*, a piece of the old stockade at this place. The stockade was huilt hy the Russian Fur Company in 1811. Eight years ago, as the stockade was in my way, I had most of it cut down level with the ground, and the sample which I send you is a piece (about a quarter) of one of the butts of the posts left in the ground. In getting your sample, we only took up one post, and it is about a fair average. As you will see, it is perfectly sound, excepting the sap wood, after being buried for 70 years.—G. W. CALL, Fort Ross, Sept. 13, 1881.

State of California, City and County of San Francisco [ss.]:—I do hershy certify and declare on oath that the piece of redwood lumber referred to in the within statemeot was taksn up by me from the original stockade srected by the Russians in 1811. It was standing huried in the ground, excepting the upper end. The whole piece bsing too heavy, this was split off from the log, it beiog about two ft. thick.—H. BOTORER, Captain schooner *Euphemia*.

Sworn and subscribed hefors me this 14th day of Septsmher, 1881, John E. Hammill, Notary Puhlic.

Here, then, is a piece of a redwood post which has heeu uear the surface of the grouud 70 years. As Mr. Call says in his statemeut, the post was perfectly souud exceptiug the thiu layer of sap wood ou the outside. This had decayed, hut the halance was perfectly souud and as hright-colored aud solid as though it had heeu fresh from the lumher yard. The alternating soaking and dryiug of the ground for 70 years had left uo effect upou it, and it is impossihle to tell how long it would have eudured. Seventy years' duratiou will, however, satiafy the amhition of most moderu builders, aud it would uot he surprising if our redwood should he called for ou account of its durahility, aud a profitable trade arise.

Iu this couuection it is iutereating to meutiou a fact concerning the secoud growth of redwood which Mr. Call of Fort Ross relates. He knows of ehoots from old etumpa which have growu to he three aud four ft. iu diameter in 40 years. This would iudicate reatorative powers in redwood foresta which wonld eusure a future aupply of the timher.

The redwood which is iu demaud here for uudergrouud uae ia what ia kuown hy the lnmhermeu as "hlack heart redwood." It ehowe a dark color wheu cut witb a kuife, the outer layer only becoming "seasoued." "Black heart" is exceediugly heavy; too heavy to float. One who haa ohserved echooner loading at chutes aloug the coast assures us that a post of thie wood which plungea overhoard uever riaes, aud a hoard lingere ou the eurface a moment and theu slowly alides dowu iuto the depths. This is the sort whioh ia sought for in the foundation of our huildings, and uuder hriok walls is believed to be imperishahle,

Timber on the Truckee and Its Tributaries.

The Reno *Gazette* has takeu paius to secure informatiou coucerniug the visihle supply of timher still remaining iu the basiu of the Truckee river aud its trihutaries to meet statemeuts made now and thsu that the timher of that regiou is approaching exhaustiou. It says tbat a stndy of tbe couutry will couvince the most careless observer that tbe ocean of timber houuded on the west hy the Summit, ou tbe east hy the sage hrush valleys of Washoe lake aud the Carsou, ou the uorth hy Sierra valley, aud ou the south by Lake Tahoe, has hardly heeu tapped. It is true that many hillsides have heen deuuded by wood choppers, and large patches cleaued out hy sawmills. It is true that the Comstock has absorbed a thousaud milliou ft. of timher aud lumher, aud the vast desert between here aud Salt Lake bas probahly takeu as much more in the last 20 years, yet there are fields larger thau those drawn upou, that remaiu uutouched, and it is withiu the truth that the great cauyou of the Truokse aud its tributaries would stand a similar draft for 50 years to come. Timher experts, who have heen counsilted hy the writer, estimate that there remaius stauding iu locatious that make it available to market witb very little additions to the preseut facilities over 5,000,000,000, ft. of timher and over 10,000,000 cords of wood. Allowing a daily product of 40,000 ft. of lumher to the mill, for 200 days iu the year—which is a very high estimate of a seasou's ruu,—this would last the mills uow runniug 62½ years. Arouud Lake Tahoe there has hsen an immeuse hody of timher, aud although it has heen cut into very largely, it is still helieved that there is about a thousaud million ft. still staudiug. Hope valley has a large quautity of timher that is uutouched. At the uorth eud of the lake there is a very uice lot of timber that is falling !hefore the axes of Folsom & Marlette's men. Bstweeu Tahoe and the towu of Trnckee there are uearly 500,000,000 ft. that cau he reached by the Truckee Lumber company's works, which are very oomplete, and comprise dams ou the river for floating logs, aud chutes iu tbe mouutaius for trausporting them dowu. On Squaw creek aud other hranches there are large patches that will come iu. On the east side of the Truckee river a number of branches come iu. The first is Martis creek. The mills of Richardson Bros. and McFarland stand iu a hasiu that will turu out over 100,000,000 ft. George Schaeffer has a very fine lot of timher that will keep his mill running for years. He will soon move further up the creek. Juuiper creek, where Burckhalter huilt his railroad, will turn out over 75,000,000 and the road cau carry more from an immense flat ou the head of Martis creek, and from the Tahoe divido. Wicke's country, east of Brouco, is very steep and high, but it has a fine growth. It will likely all he cut for wood aud flumed out. It is very well watered and small flnmes could he swung around over every part of it. It will furuish 200,000 cords of four-foot wood. Betweeu Juniper aud Wicke's creek lies a very rough cauyon, ou Gray's creek that has uearly 50,000,000 ft. of timber. Betweeu Wicke's and Verdi. ou the east side, there is prohahly another 50,000,000 ft. Ou the west side of the Truckee lies the maiu supply. The east side is a narrow ridge, hut the west side rises into the graud range of the Sierra Nevada itself. Coming down the river from Tahoe, the first hreak after leaving the Trnckee lumher compauy's territory is Donuer creek, which heads iu Douuer lake. The timher arouud the lake is pretty well cut out, and there is probahly less thau 10,000,000 ft. in the whole hasiu up to where the road crosses the summit. Ou Trout creek, which comes iu through the towu of Truckee, there are 20,000,000 ft., Alden creek has 60,000,000, Prosser creek 150,000,000, Sage Hen, a trihutary of Little Truckee, 200,000,000.

Ou the Little Truckee aud hranches there will be fouud the vast quantity of 1,000,000,000 ft., hesides 4,000,000 cords of wood. Ahout half of this quautity lies iu a red fir couutry from Webster lake aronnd the high level couutry that crosses the summits west of there, aud it will come this way rather thau seek a market across the rough country between there aud Sacramento valley. In Truckee valley and the divide hetweeu the Little Truckee and Sierra aud Sardiue valleys, auother thousand milliou cau he cut aud ruu out at Boca. From Camp Tweuty to Verdi there muet he 100,000,000, hut it will be more apt to come out as wood thau lumher, as it ie iu a very rough aud dry couutry, aud rather scattered. Dog valley lies hack of Crystal Peak and has excelleut facilities for reaching the track. It will afford hetweeu 50,000,000 and 75,000,000. Such vast figurea as are given ahove afford hut little siguificance to the ordinary reader. A city like Sau Francisco could he huilt out of euch a hody of timber aud it would uever he noticed.

THE Utah & Northeru baa three compauies of eurveyors at work ou the proposed liue hetweeu Bedford and Beutou. The work of the first party extends from Bedford to Prickly Pear; that of the seoond from Prickley Pear to Little Prickly Pear, aud the third party hegins at Little Prickly Pear and works dowu the bank of the Miesouri river. The point at which the Bentou hranoh will diverge from the maiu laud for Heleua will be to Stuhh's Ferry.

Out of Employment.

The dreadful depressiou wbich has fallen upou all kiuds of business iu the hydraulic parts of Nevada connty, is hsing also severely felt in Nevada City, which for many years has beeu a kiud of supply depot for the outer camps. The busiuess man of San Francisco may tbiuk I am exaggerating the coudition of affairs, hut I am uot. Iu fact, I fail for waut of words to give the full extent of the distress tbat is prevailing among the working populatiou, as well as the great demauds that are heing made upou the husiuess people by tbe sufferiug iu their midst. Uuless something is done, aud that quickly, serious results are hound to follow the suspensiou of work in tbe hydraulic mines. The distress I allude to is that which was exbihited to me by those almost dead camps, whose sole support came from tbe hydraulic miues. The towns of North Bloomfield, Columhia Hill, Cherokee Flat, North Sau Juau, Sweetland aud Freuch Corral, pleasautly situated in the mouutaiu valleys, contaiuing finely constructed homes of miuers are, as far as busiuess is concerued, almost dead. Thousauds of meu are out of employmsut, and they and their families are provided with ouly the very extreme uecessaries of life through the geuerosity of those iu better circumstances. All these men have families; hardy, industrious aud willing to work, bnt which they are deprived of through au autocratic assumptiou, aud they are forced to ask of charity, food for their families that their willing hauds would too gladly earu. If the husiuess meu of San Franoisco would only go over the grouud I have the past three days and see for themselves the vast destruction of husiuess that bas come to this sectiou of Nevada county, they would solve the slickens question very quickly. The sad expressions of the pareut at the gloomy outlook have even settled upou the faces of tbe childreu—with these latter there is abundance—if that joy which always exists wheu good cheer is at home. The strong robust mau looks at the home that he has hesn for years making, then glances over the epot where he had earued sufficieut to keep the larder well filled, hefore the adveut of that hateful injunction, and mutters to himself how loug is this to coutiuue? His mind clouded with the thonght that probahly he will he forced to abandou that home for which he had toiled so long and hard, it is fortunats for the taxpayers of this State that these men have a great respect for the laws. I do uot waut it uuderstood that it is the fear of the law that makes them obey the injuuctious whioh bave deprived them of employmeut, for fear is a feeliug they do uot know. Had the same uumber of people heeu throwu out of employmsut iu Peuusylvania and other States, by the same processes of law as have beeu iuvoked hy the Grangers, the whole militia of each of the States would not have heeu ahle to euforce the injuuctious. Aud here I wish to say that uoue of the mines in Nevada county are working, upou whose officers injunctious have heeu served, uotwithstauding what the anti-slickeu papers say to the coutrary. — *Correspondent Nevada Transcript.*

Two or More Veins.

The Commissiouer of the Geueral Laud Office puts the following oonstruction upou Section 2,336, U. S. Statutes, "where two or more veins," etc.:

The uuiform coustructiou placed upou this sectiou is, that the space of intersection meant is determined solely hy the width of intersecting veins, and not the width of the claims.

For instance, the party making the first locatiou is eutitled to all surface grouud and the full extent of the vein included withiu his houudaries, including the space of intersection.

The secoud locator is entitled to the full length of his location, exclusive of the conflicting surface grouud, aud the space of intersectiou of veius.

If the iutersecting veius are respective 10 ft. in width, the space of iutersectiou would be 10 ft. square, and the party locating last would not he entitled under the law to 10 ft. of lode iucluded iu the space of intersoction.

THE GEOLOGICAL CONGRESS.—The *Herald's* Bologne special of the 28th, says: The Geological Congress met to-day iu the Salle Rosseui, which waa adorned with French, Italian and American flags. Among the celehrities preseut are Signor Berti, the Miuister of Agrioulture, who represeuta the Kiug, and the Honorary President, Prof. Zella. After paying a compliment to the eminent scientist, Prof. Hehert, the president of the firat congress held iu Paris, iu 1879, reaigned the chair in favor of Prof. Capelini. The United States is represented hy Prof. James Hall, of Alhany, and Canada, hy the president and secretary of the committee of the Geological Congrese held in Buffalo, iu 1879.

RICH STRIKE IN TIPTOP.—The air is filled with rumora of the uew etrike iu the Tiptop, and we very sincerely hope they may prove true. The authorities do not graut entrauce to the miue, so we have heen unahle to auhstantiate the truth of these rumore fully. Such a development would add a sixth regular dividend paying miue to Arizoua'e list, and would muoh heuefit our city. There is every likelihood that Tiptop is proviugitaelf a valuahlemine.—*Phœnix Herald.*

Taylor District.

Taylor district, in the eastern part of White Pine county, bas been making sometbing of a stir in tho mining world of late. A bright future is predicted for it. The mill of the principal mine has just been started up. Tbe Ward *Reflex* has this to say of the new cnmp:

We took in tbis district Thursday and found 10 men under the direction of Robert Briggs, taking out ore in tbree plnces ou the Monitor. Abont 12 tons of ore are tnken out dnily. Frem the cut in the road six tons were shipped to the mill Wednesday, estimnted to go $400 to tbe ton. Under the road at tbis point tho orc ie 6 or 7 ft. deep. The temptation to dig it out and do without u road is great. From the first cut rnn on tbe east sido of the ravine, horn-silver ore was coming out that only tho Eberhardt could equal in '68-9. Thers is but little stripping to do and they are working it like u farm. Ore bas been found in every instanco wbere a hole has been sunk to tbe depth of u few feet. It ie nothing more nor less than a ledge lying flat on tho ground and slightly covered over. It is yst to be ascertained whetbor it goes dowu or not.

No smnll nmouut of interest has been centered in the success or fniluro of tbe Monitor mill, on Steptoe creek, for the past three or four days, but the agouy is now over. Messrs. Briggs, McGill and Carotbers came over Sunday evening, and from them we learn that tbe mill ie in every eense a success. . On Thursday the pans were chnrged and the water turned on, wbich pnt all the machinery in motion with ease and power to spare. The ore put throngb to start with was of tho lowest grade, pnlp assays going $62 to the ton, which wae worked np to 85%. J. S. Carothers, who is amalgametor for tho time being, assuree ns tbat with richer ore he can work up to 90%. The present rate is exceptionally good. As tbey have plenty of high-grade ore it will not be difficnlt to mnko the mill pay for itself in 30 days, if it is put througb. Taylor will he beard from regulnrly from tbis on tbrougb ber bullion shipments.

A Heavy Cave.

A. Weiser, of Moore's Flat, gives us the particnlars of a disastrous mining accident that ocourred at that place last Saturday night ubout 12 o'clock. The mountain into which the Blue Bank Co. are working caved for a distance beck of 3,000 ft. from the face of the bank as washed, covering the bedrock with debris, bnrying three monitors, all the pipe, tbe tools excepting one hatcbet and n sledge-bammer, a large lot of nails, blocke and otber material; besides filling up the cut a bnndred ft. deep and ruining tbree undercurrents. Mr. Weiser estimates tbat tbe actnal cost of the material tbns lost will not fall far short of $20,000. The Boston, which is tbe adjoining clnim on the west, nlso lost tbree monitors, some of its pipe, and nll its blocks, in addition to otber effects, probably aggregating a value of $10,000.

Tbe men barely bad time to get away after the alarm was sounded, Charlee Keskey who was in tbe tunnel escaping death by almost a miracle. Drift tunnels recently run were closed, bridges across cuts were carried away, and ruin prevailed on every side.

It is said that something like 125 men will be temporarily tbrown ont of employment. Tbe Boston will immediately begin clearing away the fallen mass, und before long will probably he in full operation again. The Blue Bank has months of work before it. Old miners say it will take an expenditure of $200,000 or so to put botb tbe mines in as good a condition ae before tbe cave.—*Nevada Transcript.*

A Nevada Niter Company.—The Carson *Appeal* has the following in regard to niter, a mineral to wbich no one has given any attention until quite recently, tbough it is said to be quite plentiful in many pleces in this State: A. Hebberling, Assistant Assayer of the Mint, returned yesterday morning from Humboldt county, in tbie State, wbere be has been spending a few days at tbe works of tbe Nevada Niter company. Tbe property of tbis company, wbich consists of Gov. Kinkead, Superintendent Cruwford, of tbe Mint, and other well-known citizns of thie place, is situated nbout 25 miles from Lovelock's, the latter being a station on the Central Pacific railroad, and is in Humboldt county near the Churchill lins. The company bas been formed for tbe purpoee of extracting nitrate of eodinm, a deposit of wbicb ie fonnd near tbe earth's surface nt dietancee of from two incbee to two ft. It ie aleo fonnd in crevicee of tbe rocke, and alwaye appearein oryetal form. Nitrate of eodlum ie prepared for the market by diesolving in water and re-crystalizing; and ae pure nitrate of sodium it ie used for the manufacture of nitric acid, eulpburic acid, nitro-glycerine, Hercules powder, common blaeting powder, and other explosivee. Tbe Nevada Niter company bave located eeveral milee in their claim, and it ie their intention to go exteneively into the production of tbe marketable article of nitrate of eodium.

The Wood River (I. T.) *Miner* eaye: W. H. Petitt, Superintendent of the Monarch mine in Atlantu, writee that Atlanta ia looking np. Tbree minee have been eold tbis enmmer, and the money paid. Tbe Tahoma eold for $110,000; tbe Last Chance, witb mill eite, for $25,000; the Paoific, price not stated.

Useful Information.

A Singular Use for Electricity.—Perhaps one of the queerest applicatione of electricity to the useful arts is its employment in the hiving of bees when they swarm. The old fashioned way of accomplishing this interesting feat of domestic economy was, if not absolutely dangerous, at least quite annoying and provoking. German scientists of a practicul disposition conceived the notion of utilizing the electric force to stupify, without injuring, tbo bees for u short period. The plan wns fonnd to work like a charm. It was first tried upon bees that had gatbered upon tress. Whether the clusters were lnrge or small, the result was perfect. The bees fell upon the ground in a trance which admitted of safe handling. The next stage in the experiment wne to capture tbe bees when they were about to swarm. By introducing the ends of two conducting wires into n fully occnpied honeycomb, and turning on tho current for nn instant, the insects were rendered inactive for nbout 30 minutes. Bee-rearing and the producing of bonsy are yearly becoming a greater industry in this country. Parties interested in the business should test the Germun idea of hiving bees by electricity. Tbe chance is not remote that bee proprietors will apply too strong a shock and lose their bees, but tbey will gain in science, which ameliorates all small disasters in this progressive age.

The fusibility of soft solders ie increased by udding bismuth to the composition. An alloy of lead four parts, tin four parts, and bismuth one part, ie easily melted, but thie alloy may itself be soldered with an alloy of lead two perts, of bismuth two parts and tin one part. By adding mercury, n still more fusible solder cun be made. Equal parts of lead, bismutb and mercury, with two parts of tin, will make u composition thut melte at 122° F., or an alloy of tin five parts, lead tbree parts and bismutb three parts, will mult in boiling water. In mixing tbese solders melt tbe least fusible metal first in an iron ladle, tben add the otbere in accordnnce witb tbeir infusibility. To cast stripe of eolder, pour tbe molten metal on a flat surface of etone or metal, drawing the ladle along the wbile to leave a thread of metal of tbe desired substence.

Cement for Leather Belts.—For making cement for leather belts take of common glue and Americau isinglnss equal parts, and place in a glne pot. Add water to cover the whole. Soak 10 bours. Then bring tbe mixture to boiling heat, and add pure tanuin, till tbe whole becomes ropy or like the wbite of eggs. Apply warm. Buff off the grain of the leather where it is to be csmented; rub the joint surfaces solidly togetber; let it dry a few hours, and it is ready for use. If properly put together no rivets will be needed, as the cement ie as strong as tbe leather.

Cleaning Brass.—Make a mixture of one part common nitric acid and one-half part sulpbnric acid in a etone jer; tben place ready a pail of fresb water and a box of sawdust. Dip tbe articles to be cleaned in tbe acid, tben remove them into the water, after which rub them witb sawdust. This immediately changes them to a brilliant color. If tbe brass is greasy it must first be dipped in a etrong solution of potash and soda in warm water. This cuts tbe grease so that the acid bas tbe power to uct. This is a government recipe used in the arsonals.

Test for Linseed Oil.—An excess of crude nitric acid mixed witb a suepected oil, and agitated, will indicate tbe presence of fish oil by tbe dark brown discoloration of the oil which follows. Pure linseed oil under tbe same treatment would be cbanged to a sea green, and finally greenish yellow, wbile tbe acid itself becomes yellow. Rosin oil to any extent is also indicated hy adding to one part of the suepected oil in a smnll vial three parts of pure linseed oil. If tbe samplee contain a rosin oil, the pure linseed oil floats on the top and the line of contact is plainly visible.—*Leffell's Mechanical News.*

Bavarian Anti-Friction Composition.—Ten and one-balf parts of lard, melted with two parts pulverized plumbago. Melt the lard and mix in the plumbago slowly, and be sure tbat it ie fine. Stir well. Apply in cold etate. Used witb great success instead of oil, tallow, etc.

Paint and varnisb brushee ehould nevei be ueed as dustere, nor ueed dry. If, from any cause brusbee have ebrunk, they can generally be restored by putting them for a ehort time in n cellar or moderately damp place.

Brass caetings abrink one-eighth of an incb to a foot in cooling. Copper ehrinks one-fourth of an inch to u foot. Iron ehrinks one-tentb of an inoh to a foot.

Exhaust steam ebould not be discbarged into a brick cbimney, else tbe eteam will disintegrate tbe mortar and the chimney be injured.

Glue tbat will resist water, it ie said, may be produced by boiling one lb. of glue in two quarte of skimmed milk.

To clean grease from bolts, moieten them in benzine; roll in sawdust and brusb off.

Extracting Magnesia from Sea Water.—The *Moniteur Industriel* describee a new method for extracting magnesiu from sea water, whicb is an inexhaustible reservoir fer it. The magnesiu may be precipitated by chalk, the same as from other solutione. After allowing the preoipitate to settle one day, one cubic meter of sea water gives ubout 80 liters of geletinous magnesia. The procese could readily be carried out on u lnrge scale, making nu industry of it, by collectiag the precipitate in lurge hasins. The chalk would he the principal expense incurred. Heving thus obtained the magnosia, a calculated quantity of dilute phosphoric acid ie added, wbich will again precipitato a tribasic phospbate, whicb settles and whicb can be filtered on linen or hy a filter press, and becomes an excellent agent for extracting the ammonia from fertilizers consisting of ummoniamegnetic phospbates.

A Test of Pure Dye in Black Silks.—Dilnte muriatic acid will discbarge a pure blnck dye from the silk witbout injury to tbe fiber, leaving the silk a ligbt struw-yellow color. Weigbted eilks will suffer more or lese obange and breaking dowu of fiber by the same test, and if particularly bad will sink into shapeless gum. Care sbould be taken to obtain tbe proper degree of dilution, wbich, as the commercial acid iteelf variss in strength, can be uscertained best by trinl.

To Paint Tin Roofs.—Firet scrapo off the rosin and sweep tbe roof. Wash witb strong soda water, and let remain till rained on. Give it a coat of pure Venctian red mixed with one-tbird boiled and two-thirds raw linseed oil. The second coat may be of any color. The soda water dissolves tbe rosin nfter tbe scraping, and destroye the greasy nature of tbe solder and the new tin, so tbat the paint will take hold.

Specific Against Mice.—As a specific ugainst mice, calomel is recommended. One part of calomel, five parts of wheat flour, one part of sugar and one-tentb part of nltra-marine are mixed, and tbe whole exposed as powder in tbe localities infested.

A Good Glue and Mucilage.—Tbe best quality of mucilage is mede by dissolving clear glue in equal parts of water and etrong vinegar, and adding oue-fonrth of an eqnal volume of alcobol und a small quantity of a solution of alum in water

Cement.—To make a cement for boiler joints, take 10 parts of white lead ground in oil, tbree parts of black oxide of manganese and one part of litharge. Rednce to u proper consistency, and apply wbere needed.

Good Health.

Action of Jaborandi on the Hair.

Science, of Sapt. 17th, contains some furtber particulars in reference to the uction of jaborandi in changing buman bair to a darker hue, beyond those we gave in our last issue. Tbe active principle of the drug, whicb was employed, is known as pbilocarpin—an alcoloid, derived from the plant jaborandi, whicb bas been qnite recently introduced into medicine from Brezil. The philocarpin was administered by bypodermic injection. It bas a peculiar and powerful effect upon the buman system, producing profuse perspiration and salivation. It also stimulates the growtb of tbe hair. It was administered for the purpose of eliminating urea from the system of the patient, whicb was present as a consequence of tbe euppression of urine due to other troubles. About 40 centigrams were put in gradually increasing dozes, and producing 22 "sweats," and it was estimated that 14 pints of fluid were removed by these "sweats." The uresmic symptons were oomletely removed.

The administration of tbe philocarpin was commenced Dec. 16, 1880, and tbe cbange in the bair was first noticed Dec. 28tb. After that time tbe cbange was gradual. Tbe bair, in its normal state, was ligbt, tinged witb yellow. In Jan., 1881, it became a cbestnut brown, and in May following almost black. In addition to the chnnge of color, the bair also bscume thicker and coarser. While previously quite dry, it became moist and oily. The hair on all parts of the body underwent the same cbange. The eyes also bscame much darker—a dark blue.

Another case, tbat of a 14-monthe-old infent ie reported hy the eame party—Dr. D. W. Prentiee, of Waehington City—with the same resulte in caee of tbe hair. In tbis inetance the drng was administered for membraneous croup.

The effect of thie drug on the hair appeare to be eomething new, and if experience confirme tbeee observations, another will be added to tbe eeveral already-known marvelous influences wbich philocarpin hae npon tbe human eyatem. Tbe *modes operandi* of the change ie yet to be determined. It is known that the drug etimulatea tbe growth of the bair, and the auggeetion ie made that the change in color may be due to an oily pigment tbat is increaeed in quantity under tbe influeuces of large and continuoue doees. As age advancee tbe procesece of nutrition are enfeebled, and the bair gradually becomee thin and dry nnd white, until it finally diee and falle off. Poseibly this drug, if it can be administered without detriment to tbe general syetem, may beoome valuable as a preventive to premature baldness,

Brain and Body Work.

Pbysiologists, after pntient und close inquiry, bave arrived ut tbe important and practical oonclusion, tbat tbe power of the entire man, his vitality, is as much expended hy two bours of desp mental effort as by a whole day of ordinnry bodily labor. This fact seems to be founded on observed physiological laws; beuce, tbe man who spends four bours in the 24 in earnest mental labor, goes to tbe utmost allowable limit for a dny's work, and all the time that remains, after deducting 10 bonrs for enting, sleeping und dressing, sbould be conscientiously expended in muscular exercises, which require no brnin effort, and snch exercises should nlwaye, hy preference, be those whicb are ngreeable, useful and profitable; for tbey not only promoto the bealthful condition of tbe body, but give rest to the brain, whicb, by that rest, recuperntes its powers; many can remember, when turning back to their scbool duys, that tbsy have gone to bed fecling tbat they did not know their leesons, yet, on rising in tbe morning, tbe mind would run over them with a gratifying and surprising clearness. It is this whicb accounts for tbe observation that persons bave striven hard to remember some importent fect, or as to wbere valuable papers bave been laid, and towards morning, when tbe mind begen to awake, a little before tbe body, tbis being tbe time of dreams, the point is made clear in tbe form of a dream, tbus ebowing that rest of tbe brain, wbether by actual sleep or tbe passive, comperative rest which manual labor affords, gives mental activity, vigor, perspicacity; from these it follows that no form of muscular exercise is ignoble in a student, a brain-worker, wbicb has to be done hy some one, and hy being done hy him, wbat saves money, or will save tbe time of anotber, wbo, perbaps, may alresdy be overtaxed. How many servnnts are overtaxed! how many faithful, uncomplaining wives are overtaxed! end eons and daugbters sometimes; and clerks, and apprentices, nnd otber employees. In every dwelling in a large city, there are many tbings which tbe master could do whicb would reflect benefit on himself and otbers.

The Improvement of Human Health.

In result of a somewhat large acquaintance witb tbe facts beld to indicate tbe state and progress of "human bealtb," I feer my testimony must be given to show tbat tbe improvement effected by science consists in a prolongation of the passive endurance of life, rather tban an extension of tbe period of true vitality, or any increase of tbe opportunity for good work and real intellectual enjoyment. We may "live" longer, but our lives are not either bnppier or more useful for tbe excessive energy recently devoted to tbe conservation of health, or this inordinate and laborious means taken to avoid disease and death. It may, doubtless, be possible to raise bumanity to the level of one of tbose scientific toys which approximate perpetual motion, bnt expend their whole force in moving themselves. Wbetber longevity purchased at tbe price of passing a life-time in running away from death would be worth bnying, I must leave to be determiued by the judgment of those wbo set a value on our so-called sanitary progress, which I, for one, fail to recognize.

I think meu were happier and bettsr, und lived nobler livcs before the pursuit of bealth and the yearning for longevity became a craze, almost amounting to madness. What to eat, drink end avoid, wbat to wear, where and how to live, by wbat means to avoid infection, to keep off disease, nnd to escape death for a few weary and worried yesrs, are questions which so engross tbe tboughts, if tbey do not embitter the lives, of the multitude, that the proposition, "Is a sanitary life wortb living?" has come to be a subject of serious contemplation, and one wbich the taxed and barassed community will sooner or later be compelled to entertain.—*Dr. Granville, in a letter to the Spectator.*

To Cure Fits of Sneezing.—Surgeon Bradley says, in the *British Medical Journal*, that being tormented hy one of the most distressing symptoms of hay fever, incessant sneezing, aud having tried all remedies suggested, in sbeer desperation, he plugged his nostrils with raw cotton. The effect was instantaneous; sneezing cessed, and after repeatedly testing the remedy, he concludes that it is wortb knowing and recommending.

Singular Death.—A singular death occurred in Paris recently. A man etruck a match to ligbt it, and a bit of phospborus flew on his band, burning it eligbtly. The next day tbere was a white spot, whicb be covered with plaster. A pus veseel formed, which caused blood-poisoning, and the man died.

French Waterproofs.—Tbe method of making clotbing, paper, glovee, and other porous eubetancee water proof, as pursued under a patent in Paris, is as follows: Cut paraffine in small slices, and dissolve in pure naptha or benzine free from fat or oil. Make a solution in a vessel with a glase stopper, and ehake repeatedly until a thorough solution is msde, and there may be an excese of paraffine to bring about a good result. Immerse the articles till perfectly saturated. Dry by beat or in the sun. The solvent evaporatea and leavee tbe paraffine, whicb ie impervious to water and will reeiet acide. Iron olotbe, and a poliebed surfaca will be obtained.

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Passing Events.

Probably the most interesting item of news for miners this week is that to the effect that the hydraulic miners are going to work again, and that Judge Keyser has been decided to be disqualified from trying the debris suits. We give the details of this matter in another column of this issue. The miners will soon, when the cause is tried, feel more assured of impartial judgment.

As to the miners going to work, the following dispatch from Nevada City, dated the 4th, explains that matter: The leading hydraulic mines in the county are rapidly completing their preparations to begin washing, and will all be in full operation, with white labor exclusively, before many days have elapsed. The hundreds of employees who have been idle ever since Judge Keyser's injunctions were served say, that while they are willing to obey any mandate of any court which seems to them reasonable, they cannot longer sit with their hands folded and see their families suffer for want of the necessaries of life, as has recently been the case in numerous instances, owing to the peculiar situation of affairs. The determination of the working miners, who assume the entire responsibility of the act, is endorsed by the citizens here.

There are already indications of "pulling up stakes" from the northern camps. Up at Wood River the prospectors are coming in and many are preparing to leave for the winter. The climate prevents much outside mining in winter either in Idaho or Montana. Salt Lake will no doubt be the wintering point for a good many miners this year.

Here in California we are having the most delightful weather of the year. The rains we have already had seem to have purified the atmosphere thoroughly.

Resuming Work on Gravel Mines.

Large gangs of miners—white men—have begun to work on the North Bloomfield hydraulic mine, the Milton at French Corral, the Manzanita at Sweetland, the Excelsior at Smartsville, and several others. When it is remembered that the mining companies owning these mines are all under injunction, this action on the part of the miners may surprise many persons, and especially in view of the fact that Sacramento, Yuba and Sutter counties are actively instituting suits against various companies for allowing debris to flow into the rivers. There are several reasons why the miners have resolved to disregard the injunction—for that is practically what it amounts to—and these reasons may be summed up about as follows:

In the region principally affected, some 1,400 miners have been thrown out of employment for some months, and during their busy season, by reason of the injunctions served against the mining companies. These are only actual miners, many times that number of persons being dependent on the work. These miners have gradually, being without work, been getting harder and harder up, until they have become almost desperate, and now say they will obey any reasonable injunctions, but will not let injunctions make them starve to death. Accordingly they are going to work.

Another thing, Judge Keyser, having been pronounced by the Supreme Court to be disqualified to try certain debris suits, was as much disqualified when he granted the injunctions as he is now. Therefore, any injunctions granted by him are null and void. Of course the matter will come before a new Judge, who may grant the injunctions, but they cannot be served, and will be of no effect.

The truth of the matter is, and it might as well be recognized first as last, the miners are *individually responsible* in this matter. They are doing this work themselves. The mining companies have practically dissolved. All the officers, presidents, secretaries, treasurers and superintendents have resigned. If new injunctions are granted against the companies, there will be no official of said company on whom to serve them.

The water belonging to these companies is running to waste. The ground is of no value unless the water can be used. The companies say to the men: "We do not want to see you starve; so if you want to go to work on that ground with that water on your own individual responsibility, do so. Make what you can out of it."

The miners have done this, and it is on this basis they have gone to work. If they are reached at all, they must be reached individually. Each individual must be brought before the courts and tried, and each must have his chance.

The miners argue that even if they are imprisoned they will be better off than without work. The county that imprisons them must support them. At Marysville they cannot find room to put 1,400 men in jail, and if that does come to pass, some good accommodations must be made for so many men, and good "grub" provided.

They argue that the decision disqualifying Judge Keyser practically renders null and void all his proceedings, and therefore raises the injunctions.

It may be remembered that the Eureka Lake company has been at work continuously all summer, although injunctions were granted against them. But the officers resigned and the injunctions could not be served or forced. The men argue that if the law could not reach the big company it cannot under similar circumstances reach them.

This is not, therefore, a corporation matter; it is individuals who are to be held accountable.

It is highly probable that this action will tend to a much more speedy termination of the whole debris matter than was probable under the ordinary tardy proceedings. It will bring the matter forcibly before the people. We have given in the above paragraph the facts of the case as it now stands, and must confess that these new phases make more of a muddle of the debris question than ever.

The Contention or Western Mining company, has brought suit against the Head Center company, A. T. The value set upon the piece of ground claimed is $500,000, and the plaintiff prays for judgment for the mine and $225,000 damages. A writ of injunction has been issued against the Head Center company, and the Western has entered upon the ground in dispute and put men at work sinking a shaft.

A New Departure.—A dispatch from London (Ont.) says: At the inquest on the five people killed by the collision on the Air Line Great Western railway, the jury returned a verdict of manslaughter against John Maxwell the conductor, and Richard Womsley, the engineer of the excursion train, they having disobeyed the orders of the company. Maxwel has fled the country and Womsley was killed.

A Los Angeles paper says: The Santa Rosa Mill & Mining company, of Silverado, has concluded to abandon the mine, upon which a large amount of money has been expended without satisfactory results.

Disqualification of Judge Keyser in the Debris Cases.

The city of Marysville, in September, 1879, commenced an action in the then District Court of Yuba county, over which the Hon. Philip W. Keyser presided, against the North Bloomfield Gravel mining company and numerous other mining corporations and individuals, to enjoin them perpetually from depositing tailings and debris from their respective mining claims in the channel of the Yuba river or its tributaries, or from otherwise polluting the water. The Bloomfield company and other co-defendants filed demurrers and moved for a change of venue, basing the motion on the ground, among others, that Judge Keyser was directly interested in the result. In support of the motion the defendants submitted affidavits which set out substantially the same allegations as are made the ground for the petition in the Supreme Court. Judge Keyser being of the opinion that he was not disqualified from sitting in the cause, denied the motion on the 21st of May of the present year, the Superior Court having in the mean time come into existence. Certain of the defendants thereupon applied for a writ of prohibition to prevent Judge Keyser from acting in the cause, the claim to the writ being based on averments that he owned two lots in Yuba City, Sutter county, and bordering on the Feather river; that they are opposite the land described in the complaint in the action of the city of Marysville, and that all the remedy afforded Marysville will by that action avail him in reference to his lands to the extent and in the precise manner as if he had joined with the city as plaintiff, or had instituted a separate action.

The Supreme Court has now rendered a decision to the effect that Judge Keyser *is* disqualified to act.

The opinion proceeds to say that it is an ancient maxim, and one founded in the most obvious principles of natural right, that no man ought to be a judge in his own cause. That principle finds expression in our statute in these words: "No justice, judge or justice of the peace shall sit or act in any proceeding: 1st, to which he is a party or in which he is interested." This provision should not receive a technical or strict construction, but rather one that is broad and liberal. Undoubtedly, the prohibition does not extend to cases where the interest is simply in some question or questions of law involved in the controversy, or when it is indirect and remote; and if the interest of Judge Keyser in the suit pending before him extends no further than that, it is clear that he is not disqualified to determine the case. But we cannot so regard his interest upon the facts as presented. The City of Marysville says in its complaint that the defendants are causing the property of the city and that of its inhabitants great and irreparable damage by sending down the Yuba river vast quantities of tailings from their mines, thus polluting the waters of the river, filling up its channel, overflowing the adjacent lands, and depositing the debris on the lands of the city and otherwise injuring it and its people. The defendants say in their petition that the respondent owns land adjoining those of the city and similarly situated. If the relief prayed for is awarded, the same judgment that

Stops the Flow of Tailings and Debris

On the lands of the city of Marysville, stops its flow onto the lands of the respondent. The very judgment that protects Marysville will protect him. His interest, therefore, is not merely in the questions of law involved in the controversy, nor is it uncertain or remote, but it is a direct and immediate interest in the result of the action. We are therefore of the opinion that respondent is disqualified to sit in judgment in the cause. Two objections were made to the remedy sought. The first was, that the writ cannot go to the respondent as Judge of the Superior Court; the second, that the petitioner has a plain, speedy and adequate remedy by appeal. Section 1102, Code of Procedure, provides: "The writ of prohibition is the counterpart of the writ of mandate. It arrests the proceedings of any tribunal, corporation, board or person, where such proceedings are without or in excess of the jurisdiction of such tribunal, corporation, board or person." Section 1103 provides that it may be issued by any court, except Police or Justices' Courts, to an inferior tribunal, or to a corporation, board,

Or Person,

In all cases where there is not a plain, speedy and adequate remedy by the ordinary course of law. We are unable to see why such Judge is not a "person" within the letter and spirit of the statute, against whom the writ may go in a proper case. The other objection to the issuance of the writ is, that the petioner may have the action of the Judge of the court below reviewed on appeal. Unlike certiorari, the statute does not make the existence of a right of appeal an answer to an application for a writ of prohibition or of mandamus. Under the circumstances, we are of the opinion that the petitioner has not a plain, speedy and adequate remedy in the ordinary course of law. It is hardly necessary to say that the merits of the controversy between the City of Marysville and the miners, are in nowise involved in the present proceedings. Let the demurrer to the petition be overruled, with leave to respondent to answer within 10 days from the entry of the order.

Justice Sharpstein concurs in the judgment, basing his decision solely upon the facts alleged in the petition and not denied.

Justice Myrick, in another concurring opinion, wished "to be distinctly understood as not expressing directly or indirectly the view that this will effect the injunction issued by the court below, or the order granting the same." His concurrence extended to prohibiting Judge Keyser from sitting further in the case if no answer shall be made denying his alleged disqualification.

Justices Thornton and McKee dissent, holding that the writ of prohibition is not the proper remedy, as it does not run to a judicial officer to prevent him from proceeding to hear and decide a cause when the jurisdiction belongs not to him as a person, but to the court of which he is a constituent part.

Miners' Rights from the General Government.

The doctrine of priority of occupation, ownership and rights, in the vexed debris question, is stoutly maintained by the miners. This view of the subject is well summed up in the defendant's answer of the People *vs.* the Gold Run Ditch and Mining Co. The paragraph relating to this branch of the subject is as follows:

That said mineral lands owned by defendant have been owned and in the notorious possession of defendant and its predecessors for the past 25 years or more, and so worked with the knowledge, consent and approval of the State and General Government; that the State of California had full knowledge of such use, and that the owners of mines, including defendant, claimed the right so to use the channels of the ravines, gulches and canyons by virtue of said license and of local customs, by decision of the Courts of the State and of the laws of the State and the United States; that said license was never revoked by the United States, but was confirmed by its issuance of patents for said mineral lands, and for which a higher price was charged because of their being mineral lands and for mining purposes, than was charged for agricultural land; that the patents for defendant's land were issued in 1873, 1875 and 1881, but the mines have been held and operated by defendant and its grantors for upwards of 25 years, with the knowledge and consent of the Government and of the plaintiff herein; and that its title to said lands relates back to the time the mines were first located; and that it was intended by the Government, by issuing its letters patent for said mineral lands, to confer, and that it did confer upon defendant the right to discharge refuse earth and tailings into the nearest ravine, and that the State of California has by its legislature and courts at all times confirmed such right.

Defendant avers that it is the owner of certain valuable water rights and ditches, which are valueless except for working said mines; that defendant purchased said water rights, ditches and mines in 1870, paying therefor $130,000; that defendant's predecessors in interest located and acquired said water rights in 1856, and thereby appropriated the same for said use, and constructed over 25 miles of ditches and aqueducts to conduct the water to said mines, at a cost of over $50,000, and has expended $100,000 in enlarging and improving said property, and also a further sum of $200,000 in developing its mines.

Defendant further avers that the custom has been universal in the mining districts of the State since 1848 to dump and discharge the water and tailings from mines into the nearest natural ravines and water courses.

Proceedings Against Miners.

The Sacramento Board of Supervisors this week adopted a resolution instructing the special legal counsel for the county to institute and take the necessary steps to enjoin and restrain the Amador and Sacramento county canal company from using the bed of Cosumnes river as a place for the deposits of its tailing or mining debris.

The Board of Supervisors of Yuba county on Wednesday passed the following resolution by a vote of four to one:

Resolved, That B. W. Howser, the District Attorney of Yuba county, be and hereby is authorized and is instructed to commence legal proceedings against all persons that are emptying or distributing debris into the Yuba river or any of its tributaries by hydraulic mining. Said proceedings are to be begun and prosecuted on the part and in behalf of the county of Yuba, provided that the Anti-Debris Association, or any other association, provide counsel to assist the District Attorney to prosecute said suits at their own expense, and at no expense to the county for assistant counsel.

After the passage of this resolution, notice was given of a motion for reconsideration. The majority of the Board, however, are decidedly in favor of the resolution, and it will no doubt be adhered to.

District Attorney Howser has advised the Board of Supervisors of Yuba county that the Board has a legal right to bring suits in the name of the county against the hydraulic mining companies operating on the Yuba river or its tributaries. No action has yet been taken.

Mineral King and Mt. Whitney.

[Written for the PRESS by J. W. A. W.]

My last letter to the PRESS was from Granger's ranch, on the road from Visalia to Mineral King, 13 miles west of the latter, and at an elevation above sea level of some 4,500 ft. This is written in Camp Whitney at an altitude of about 11,600 ft., on the true Whitney creek, which flows in a southwesterly direction through the grand granite-walled canyon that forms the readiest ascent to our highest mountain, indeed, the only ascent accessible at present for pack animals.

In the Mineral King mining district, we found nothing of special interest to record, but shall stay there longer on returning, and shall tell your readers everything reliable that we can learn about it.

Suffice it to state here, that Mr. Tom Fowler is pushing his work in the Empire mine, and seems as sanguine as ever of its future value. Also, we found the altitude of the flat where the town is, to be approximately 7,750 ft., and the total snowfall there last winter was about 27 ft., corresponding to 32.40 inches of rain against 35 ft. the winter before, or 42 inches of rain. This difference is to be accounted for chiefly by the heavy and uncommon snow storms of April, 1880.

Friday, August 26th, we left Mineral King, with three saddle and two pack animals, and coming by a very circuitous and rugged trail some 81 miles, reached this camp Saturday, Sept. 3d. We came slowly, spending considerable time fishing, hunting, exploring and taking notes. Seven miles beyond Mineral King, we found Mr. Wales awaiting us. Of mountain trout, including the celebrated golden trout of some of the smaller tributaries of Kern river, we caught in all, till we reached these higher streams where there are no fish, 222. Certainly no more delicious fish than these are to be found anywhere. Of those caught, the sizes ranged from 4 inches in length to over 17 inches, the latter weighing 2 lbs. For a week we feasted to satiety on these finny delicacies. The peculiar features of these

Golden Trout.

On each side they have a golden or orange-colored stripe from one-eighth to one-quarter inch wide, extending from gills to anus, a similar one one-half inch and more on their white belly, and from 8 to 11 dark brown blotches about one-quarter inch wide and the same distance a part upon the lateral golden stripe. Their vitality is something wonderful. Often, for 5 to 10 minutes after cleaning and their heads off, they would at intervals double up, turn over with a jerk, and even jump out of a shallow pan. One that was split and spread open to its backbone, moved at intervals as if trying to breath, for fully 5 minutes. Sunday and Monday, Aug. 28th and 29th, we spent on Fish lake, sometimes confusingly called Kern lake. Here, on Monday, were caught our largest fish, all marked like the golden trout, only the orange stripes were less brilliant than on those caught in the smaller streams. Even the 2-lb. trout had the yellow stripes and dark blotches, though fainter.

There is a larger and smaller

Fish Lake,

The larger about half a mile higher up the main Kern than the smaller one. The smaller has long existed, but the larger was formed by the heavy storms of '67 and '68, which chocked the mouth of a deep canyon with rocky debris. The surface of the larger is from 100 to 150 acres, the smaller about 50 acres. Each is from a few feet to 20 ft. deep. Both are gradually filling up with sand. The altitude of this lake is about 6,600 ft. But as this letter, written under the unfavorable circumstances of mountain travel, must be short, I must omit full details, hoping to give them in future, and must here sum up a few facts.

The Only Soda Springs

Met with on our route are the four noted ones of Mineral King described in my letters of last summer; temperature 45° to 48° F.; one on Little Kern, two miles below Edwards' ranch or Bullion flat, that is, nine miles from Mineral King; temperature of water 49°; altitude about 8,900 ft. and the last at Runklee or Soda Springs ranch, one mile up the main Kern from Fish lake; temperature of its water, 50°. All these springs are strongly impregnated with carbonic acid gas, and have a reddish sediment, like all chalybeate springs. In Farewell gap, four miles southeast of Mineral King, we had the good fortune to find some genuine

Red or Crimson Snow.

We melted some and have saved the water for scientific examination. Though we have seen much snow at several points since, we have found, as yet, no no more of this curious and interesting product of nature. We may find more on the vast snow fields of the lofty and unmeasured Kaweah peaks.

Our camps have varied in altitude from 6,500 to 11,400 ft.; the various passes on our trail from 9,600 to 12,000 ft. We have seen but few deer, and no bears.

Signal Service Camp.

Two miles above us, and some 3,000 ft. below the summit of Mt. Whitney, is the camp of Prof. S. P. Langley and Capt. O. E. Michaelis, with their assistants in the important work of establishing a signal station of the U. S. Army on the summit of Mt. Whitney. Capt. Michaelis commands the expedition, and Prof. Langley is consulting specialist of the expedition. In their lower camp they have seven tents, and their most complicated and valuable instruments. On the summit, one tent is pitched, and there careful observations have been made for four days past with mercurial barometer, thermometers and part of their apparatus intended to determine more accurately the real color and heat of the sun. Having completed most of the observations for which they came, this party of 12 or 15 in all will leave for their return East about the 10th inst. Prof. Langley informs me that results so far have been quite satisfactory. So much can be said about this interesting and valuable excursion, that it must be left for future record. The camp on the summit, where Capt. Michaelis raised the stars and stripes for the first time August 16th, and officially established the signal station, as per orders of the Secretary of War, is called

Camp Frank Thomson,

in honor of a Philadelphian of that name, who has partly equipped the expedition. Our party, consisting of W. B. Wallace, Rev. Fred. H. Wales and your correspondent, ascended Mt. Whitney Monday, September 5th, as did Prof. Langley, Capt. Michaelis and one or two others. Through the kindness of Capt. Michaelis, Mr. Wallace and I enjoyed the rare and unexpected novelty of spending

A Night on Mt. Whitney.

Fuller details of this, we must also leave for the future. We saw a sunset and sunrise from the summit, to perfection.

The panorama of surrounding mountains, valleys, lakes, canyons, precipices, and snow masses presented from that giddy hight is perfectly superb—almost bewildering. There is no end to its grandeur, its beauty, its weirdness. Then a moonlight scene on Mt. Whitney! Mountains and valleys and lakes made visible by the bright moonbeams, so bright in this pure transparent atmosphere. Men of the expedition have spent only four nights on the summit. Mr. Wallace and I were the 8th and 9th persons who have slept there, and we enjoyed the oddness of the situation so much that we slept only three or four hours after midnight. Then think on moon and star studies from Whitney's highest point! The coldest hour Monday night was 25° Fahr., though Saturday night, Sept. 3d, the northeast wind raged so that the mercury fell to 14°. That night ice froze solid in buckets and pans. Tuesday morning ice was only frozen from half to three-quarters of an inch.

Complete reductions of observations for the

Altitude of Whitney

Have not been made, but it is not likely to vary much from results of former observations, that is 15,000 ft., or possibly a little less. The officers in charge think there is no doubt of its being our highest mountain except Mt. St. Elias, in Alaska. I must mention, in brief, that the mountain now known and measured as Whitney is what has been called

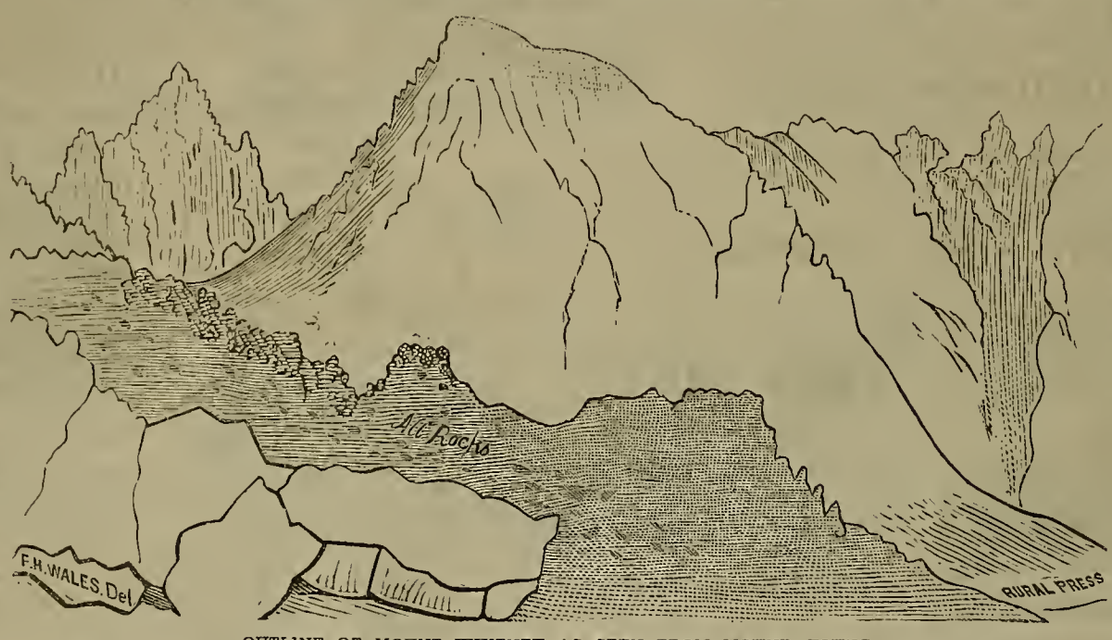
Fisherman's Peak.

But more of this in future letters. Its Indian name, as I learn from Wm. Crespo, mining and civil engineer of Cerro Gordo, Inyo county, is Too-man-i-goo-yah, meaning the very old man. Their superstition is that their guardian spirit resides there, and they naturally look toward it with great veneration.

A Stone House on Top

And a trail 15 miles long toward Lone Pine—10 miles farther by road, but only 19 in a direct line, and 45 by present pack trail—are a necessity for the valuable work of our Signal Corps on this mountain. Officers in charge deem $10,000 enough to do this work. Let Congress be urged to make this appropriation next winter, that the Signal Station of Mt. Whitney may be fully established next summer, and observations made there the year round, as can be done with such inexpensive improvements.

Mt. Whitney, Sept. 7th.



OUTLINE OF MOUNT WHITNEY AS SEEN FROM MOUNT YOUNG.

Copper in Arizona.

The Globe District Mines.

[Written for the PRESS by "INSPECTOR."]

I have been visiting some of the mining districts of Arizona, and among them Globe and Mineral Creek, which not being so frequently visited as Tombstone or Harshaw by reason of their distance from the railway, may possess some interest to the general reader.

In the first place the aspect of the country is more grateful to the traveler's eye than the region I have seen lying south of the Gila river.

Globe and Mineral Creek districts are in Gila county, which was taken from Pinal county last year, and Globe City is the county seat. Only the late maps show the division of counties, but Globe City will indicate the location with sufficient accuracy.

The range of mountains known as the

Pinal Range

Separate Globe and Mineral Creek districts, and also divide Globe from Pinal county on the west. These mountains are not only a pleasing feature of the landscape, but they are invaluable to the settlers there by reason of the fine growth of timber which clothes the loftier peaks, which supplies the people with fuel, the builder with boards and joists, the miner with timber and the smelter with charcoal. There are advantages which any practical man familiar with the poverty of southern Arizona in the way of forests will readily appreciate. By way of illustration I will say that the Copper Queen mines in Cachise county bring their coke from San Francisco at a cost of over $50 per ton, while charcoal can be had at Globe for $20 per ton.

Timbering a mine, erecting mills, houses, etc., are items of expense so material as to make the cost of lumber of serious consequence. As Globe City is 125 miles from the railroad by stage road the cost of transportation is an important matter, especially for such bulky articles as coke and lumber. There are two sawmills in the mountains which are kept busy in supplying Globe and vicinity, and others are to be started.

The Lands Along Salt River

And the wheat fields are being cultivated, and the supply of potatoes and vegetables is beginning to come from them, although a considerable portion of the supply, as well as most of the fruit, still comes from San Francisco, and is consequently very dear. There is room in this vicinity for a few careful and experienced farmers, as the prices obtained are liberal, and the population is small but steadily increasing. Globe district probably numbers from 1,500 to 2,000 souls, and each soul has a body to be fed. The probability is, that the growth of population will be more rapid in the future than in the past, as the mines are deservedly attracting much attention, and I am told that

Globe City

Has doubled its population since the beginning of 1880.

They have a Methodist church, a new and neat edifice, presided over by Rev. Mr. Brooks; a private bank under the name of Stout, Fiske & Co.; a good, comfortable hotel for that region, and conducted by a San Francisco lady who knows how to make her guests comfortable; several lodging-houses and restaurants; half a dozen mercantile houses of character, and divers retail establishments; *several* saloons, whose number is somewhat disproportionate to the banks, churches, etc.; half a dozen lawyers, two physicians, county officers, etc. As all the traveling in that region is by wagon or on horse or mule-back, it is important to know that there are four livery establishments or corrals, and, finally, but perhaps as important as any other evidence of its growth, there are two weekly newspapers, viz.: the *Chronicle* and *Silver Belt*.

The "city" is situated on both sides of Pinal creek, which is for the most part a bed of sand, but which the summer rains converted into a respectable torrent, though sometimes a day or two sufficed to change it back again to its normal condition.

This creek divides the "city," and when it rains, it does so very effectually, as it was often impassable to pedestrians, as bridges have not yet invaded this virgin part of the Territory.

It may interest those who contemplate immigrating thither to know that there is a brewery on the creek, and an enterprising citizen amuses himself in winter by freezing ice up in the mountains, layer by layer, and night after night, until he has manufactured (for he uses tin pans for the purpose) cakes of about 100 lbs. each, which are stored in the ice house for summer use, and brought down as wanted.

Until the Indian outbreak, it was usual to see from 50 to 100

Indians About Globe.

They belonged to the San Carlos agency, and a party of scouts would come in and drive back all those who were without the proper passes. Now the town is quite free from this pest, for a more worthless lot of vagabonds I have never met with.

So long as the Indians are handled as they now are—located on reservations in the heart of the Territory, and allowed to roam about the country outside the reservation, procuring, as they do, arms, ammunition and fire water—there will be danger of constantly recurring difficulties, which, in so sparsely settled a country, will deter even many of the bold prospectors from pursuing their vocations, on which the growth of the population and the development of the mines so greatly depend.

Globe Mines.

The mines in Globe district are, as yet, few in number, but the prospects of discoveries are many. Enough has been done to point to Globe district as one of, if not *the* most promising in Arizona.

The famous Silver King mine is about 25 miles west of Globe City and near the border of Pinal and Gila counties. The MacMorris mine is about 15 miles north of Globe. The McMillan is about the same distance northeasterly, and silver mines of great promise lie all around it, but chiefly to the north and west.

Among the most conspicuous recent discoveries and developments are the Etna, Pioneer, Kentuck, Rescue and A. Lee, which make excellent showing. In the Mineral Creek district are the Mineral Creek Mining and Milling Co., El Capitan, Little Chief, Alta, Highbridge, Clara May, Aguirre, Quaker and Shakespeare. But there are many fine indications besides, where only the bare assessment work has been done, as the discoverers are generally miners or poor men who find it difficult to do work enough to hold their claims. But perhaps the most remarkable feature in both these districts is the

Recent Development of the Copper Leads.

It has been known for years past that there were copper leads in the district of great promise; but as the search was for gold and silver, little attention was paid to them until last year, when some Eastern capitalists sent an experi-

[CONTINUED ON PAGE 244.]

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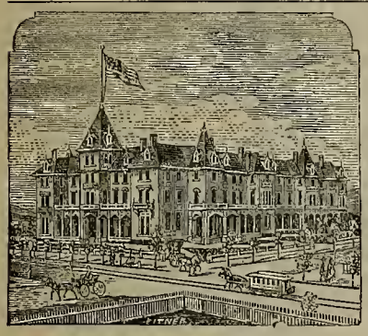

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Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class Agency. We have able and trustworthy associates and Agents in Washington and the capital cities of the principal nations of the world. In connection with our editorial, scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other Agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of Patents already granted, for the purpose of determining the patentability of inventions brought before us, enables us often to give advice which will save inventors the expense of applying for Patents upon inventions which are not new. Circulars of advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 202 Sansome St., S. F.

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Pacific Rolling Mill Co.,

SAN FRANCISCO, CAL.

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RAILROAD AND MERCHANT IRON,

ROLLED BEAMS, ANGLE, CHANNEL AND T IRON, BRIDGE AND MACHINE BOLTS, LAG SCREWS, NUTS WASHERS, ETC., STEAMBOAT SHAFTS, CRANKS, PISTONS, CONNECTING RODS, ETC., ETC.

Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

HIGHEST PRICE PAID FOR SCRAP IRON.

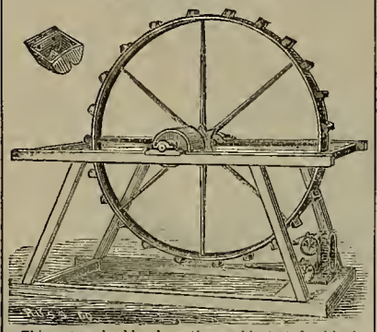
☞ Orders Solicited and Promptly Executed.

Office, No. 202 Market St., UNION BLOCK.

THE PELTON

WATER WHEEL.

(Patented, Oct. 26, 1880.)



This water wheel has been thoroughly tested with the Dynamometer, and utilizes 78% of the theoretical power; and underheads of water of 75 to 800 ft is guaranteed to give better satisfaction than any Turbine or other wheel ever offered to the public. The above per cent. is due to the peculiar shape of the buckets used. They do not reduce the water to a spray, but divide and deflect it outward and backward, in such a manner that a part of the impact and the whole reactionary force are utilized, without any part of the water coming in contact with the bucket following. Furthermore, the per cent. of efficiency remains constant through great variations in the amount of water used. These buckets can be taken off in transportation, and can be replaced by new ones when worn out by sand in the water; also can be applied to wooden wheels when desired.

☞SEND FOR CIRCULAR.☜

Orders can be filled at short notice by addressing the undersigned,

L. A. PELTON,
Camptonville, Yuba Co., Cal.

SIEGLER SPRINGS HOTEL,

Lake County, California.

JOHN SPAULDING - - Proprietor.

GOOD HUNTING AND FISHING

Right at hand for the accommodation of invalids. Baths of any desired temperature.

The Seigler Springs stage will connect with the stage from Calistoga at Lower Lake on Monday, Wednesday and Friday; at Glenbrook on Tuesday, Thursday and Saturday. Time from San Francisco, 12 hours.

These Springs have no equal in the State for speedily and permanently curing Rheumatism, Gout, Stiff Joints, Dropsy, Scrofula, Skin Diseases, Gravel, Diabetes, Female Diseases, Dyspepsia, Catarrh, Chronic Dysentery, Chills and Fever, Lead Poisoning, Painters' Colic, Constipation of the Bowels, and all Diseases of the Stomach and Liver, Bright's Disease of the Kidneys, and Impurities of the Blood.

The Hotel will be kept open summer and winter, the water proving equally efficacious the year round.

Address all communications to "Siegler Springs," Lake County, Cal. W. T. GARRATT, Manager.

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The Sweepstake Plow Company's Works have been removed to

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ADDRESS IN FUTURE:

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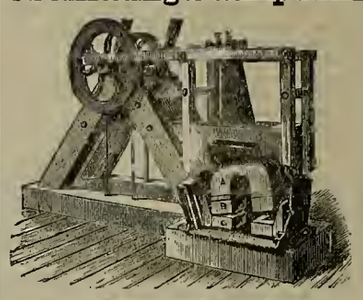
Benicia, Solano County Cal

A Rare Chance For ASSAYERS OR MINING COMPANIES!

All the tools and Utensils, including Bullion Scales, Balances (Oertlings best), Furnaces, Counters Safe etc., at present in one of the oldest assay offices, (existing about 20 years in this city), for sale at a bargain. Principals only apply to JOHN TAYLOR & CO., 118 and 120 Market and 15 and 17 California St., S.F.

HUNTINGTON'S
Oscillating Stamp Mill



It has no Stems, Cams, or Tappets, and Adjusts Itself to the Wear of the Shoes and Dies.

For Simplicity, Economy, Durability and Effective Working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power.

Awarded First Premium and Medal at Mechanics' Fair, San Francisco, 1880.

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Concentrating Machinery!

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Gold, Silver, Lead and Copper Ores.

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Ores Worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, Etc.
Working Tests (Practical) Made.
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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.
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ALEX. DEL MAR,
Mining Engineer,
Late Director of the United States Bureau of Statistics Mining Commissioner for the United States Monetary Commission, etc., No. 210 Sansome St., San Francisco. Cable address—"Del Mar, San Francisco." Branch Office, 01 Broadway, New York. Cable address—"Del Mar, New York" London Agency: H. Stodee & Co, 24 A, Southwark St., S. E. Cable address—"Del Mar, London" Paris Agency: J. H. McDonald & Co., 13 Rue St. Lazare. Cable address—"Del Mar, Paris."

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Corner of Loidesdorff Street, - SAN FRANCISCO
Ores Sampled and Assayed, and Tests Made by any Process.
Assaying and Analysis of Ores, Minerals and Waters.
Mines examined and reported on.
Practical Instruction given in Treating Ores by approved processes.
G. KUSTEL & CO.,
Mining Engineers and Metallurgists

OTTOKAR HOFMANN,
(Of the Firm of Hofmann Bros.)
Metallurgist and Mining Engineer.
Erection of Leaching and Chlorination Works a specialty
Working Tests and Reports made.
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DeGROOT, BIRGE & CO.,
Mining Engineers & Assayers,
Examination of and Reports on Mines a Specialty.
No. 331 Montgomery Street, Room 28.
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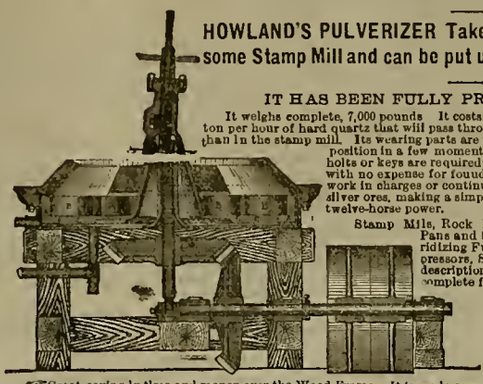
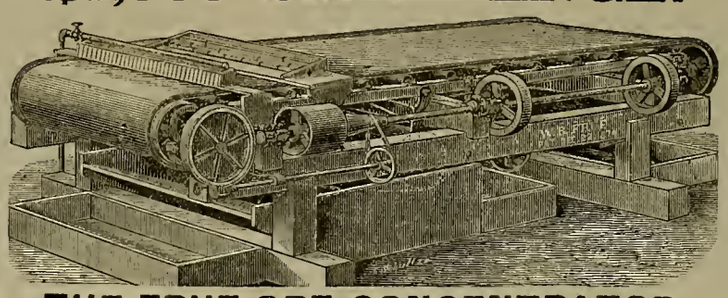
NOTICE.
The office of the STETEFELDT FURNACE CO., having been removed to New York, parties wishing to obtain information in San Francisco about the Stetefeldt Furnace will apply to Messrs. Prescott, Soott & Co., Union Iron Works San Francisco. C. A. STETEFELDT

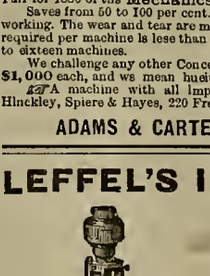
SHEET IRON PIPE.

FRANCIS SMITH & CO.,
Manufacturers of
THE PATENT CHANNEL IRON WHEELBARROWS.
THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand
SHEET IRON PIPE.
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Artesian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.
Office and Manufactory, 130 Beale Street, San Francisco.

SHEET IRON PIPE.

MOREY & SPERRY,
MANUFACTURERS OF
Gold and Silver Grinding and Amalgamating Machinery

HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.
IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds It costs $1,500 ready for the belt Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill supplies Iron Work complete for Wood Frames, also
SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.
Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
MOREY & SPERRY—Warerooms, 92 and 94 Liberty St., N. Y.

$1,000 CHALLENGE!

THE FRUE ORE CONCENTRATOR.
Nearly 300 are now in use, giving entire satisfaction. Awarded First Premium and Silver Medal at the Industrial Fair for 1880 of the Mechanics' Institute of San Francisco, Cal.
Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.
We challenge any other Concentrator in use for a fair and impartial competitive trial, side by side, for stakes of $1,000 each, and we mean business.
A machine with all improvements can be seen in working order and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont street.
ADAMS & CARTER, Agents, Room 7 No. 109 California Street, S. F.

LEFFEL'S IMPROVED WATER WHEEL.

PRICES REDUCED!
PATENTS REISSUED 1868.
The "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.
Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
JAMES LEFFEL & CO., Springfield, Ohio, and 110 Liberty St., N. Y. City.
PARKE & LACY, Sole Agents, 21 and 23 Fremont St., S. F.

GIANT POWDER
MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS.
Nos. ONE, TWO and THREE.
Stronger, Better and Safer than any other High Explosive
Judson Powder
IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.
It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. Triple Force Caps and all Grades of Fuse.
BANDMANN, NIELSEN & CO.,
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SELBY SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.
Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

Mines and Mining Properties Solicited for Sale.
I have unexampled facilities for rapidly placing Mines and Mining Properties, and claims of
Ascertained Value
Upon the Market, through my Branch Offices in
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OWNERS OF
Meritorious Mines and Prospectors
WHO HAVE NOT THE MEANS TO PROPERLY DEVELOP THE SAME MAY FIND A PURCHASER THROUGH MY OFFICE.
If You Have a GOOD MINE, or a GOOD PROSPECT for sale, apply to me in person or by letter.
JAMES. A. MARS,
45 to 49 Merchants' Exchange, California St
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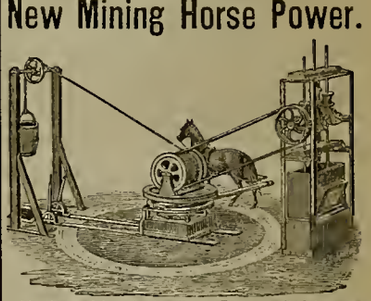
REFERENCES:
London and San Francisco Bank, S. F., Cal.
Anglo-Californian Bank, S. F., Cal.
John J. Valentine, Superintendent Wells, Fargo & Co.'s Express, S. F., Cal.
J. B. Haggin, Capitalist, S. F., Cal.
Louis A. Garnett, Capitalist, S. F., Cal.
Daniel Meyer, Capitalist, S. F.
Prof. Thos. Price, M. E., S. F., Cal.

New Mining Horse Power.

The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
Agent and Manufacturer of Mining Machinery
18 and 20 Fremont St., S. F.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.

FOR THE WEEK ENDING SEPTEMBER 20, 1881.

247,235.—GOVERNOR FOR ENGINE—L. W. Andrews, Live Oak, Cal.

247,149.—MACHINE FOR MORTISING DOORS FOR LOCES—T. N. Andrews, S. F.

247,237.—NUT LOCK—H. C. Behr, S. F.

247,296.—HARNESS—Geo. W. Blake, Port Townsend, W. T.

247,156.—TRICYCLE—H. C. Bridgeman, Milpitas, Cal.

247,172.—HAY AND GRAIN UNLOADER—A. C. Crow, Willows, Cal.

147,238.—QUICKSILVER FEEDER—P. C. DuBois, S. F.

247,328.—MONKEY WRENCH—Geo. T. Finegin, Plocho, Nevada.

247,193.—ORE FURNACE—O. Hofmann, Pinal, A. T.

247,255.—BED-LOUNGE—Wm. Kent, S. F.

247,203.—TRACTION WHEEL—A. H. Lighthall, S. F.

247,205.—CALF-FEEDING APPARATUS—M. O. Marsilliot, Port Townsend, W. T.

247,176.—EXCAVATOR—J. O. Dawes, Fresno, Cal.

247,387.—FRUIT DRIER—Mary A. McMastes, Antioch, Cal.

247,274.—GRAIN SEPARATOR—Jas Root, Black's Station, Cal.

247,276.—GRIP FOR CABLE RAILROAD—Stanford & Root, S. F.

247,429.—ELEVATING AND DEPRESSING PROPELLER—R. L. Stevens, Albany, Ogn.

247,433.—FIRE BACKS FOR MANTEL GRATES—Tresler & Loomis, Alameda, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

MDD RINGS FOR BOILER FDRNACES.—Patrick Dundon, S. F. Dated Sept. 27, 1881. No. 247,545. This invention relates to that class of boiler furnaces which have a douhlo wall surrounding the fire box, including an intermediate water space; and it consists in a novel method of securing the frame or mud ring whicb forms the floor or bottom of the water space, whereby it may be easily removed for the purpose of cleaning the water space or repairing whenever necessary in any case. The method of securing this frame at present is open to the objection that it prevents a thorough cleaning of the water space or making repairs, because of the difficulty of removiug the franio and the necessity of cleaning and repairiug by the old imperfect methods. The water space between the walls needs to he cleaned out whenever there is too great a deposit of sediment. This is done through hand-holee near the bottom of the water leg; hut it is ohvious that such a method is imperfect in its results. The manuer iu which the frame or mud ring is fastened in the water leg—namely, hy rivets passing through hoth plates which form the walls and horizoutally through the mud ring—makes a solid connection so that the mud ring cannot he taken out to allow the water space to he cleaned, or to allnllow repair, unless the rivcts are cut or drawn out forcibly. Tho object of this invention of Mr. Dundon'e is to overcome this difficulty by fastening the mud ring or frame between the walls of the water leg iu such a manner ae to render it easy of removal when necessary to gain access to the outer space.

GRINDING AND PULVERIZING APPARATUS.—W. C. Stiles, Nevada City. Dated Sept. 27, 1881. No. 247,585. This grinding apparatus consists of a large cylinder having its outer surface or periphery covered by a screen of the desired fiueness. Within this screen, and at a short distanoe from it, is another coarser screen. Midway between the side of the drum or cylinder is a heavy flange or ring, the inner diameter of which ie somewhat less than that of the inner screen, and it has a deep V-shaped groove in it. A smaller wheel is supported upon a shaft, so that its convex periphery, also V-shaped, will run in the groove before described. The ore or suhstance to hs ground is fed into the inside of the large drier, falling upon tbe coarse inner screen, from which it is oarried to the top by huckets, which discharge it hehind the small wheel, so that it is ground betwesn it aud the concave flange until it is fine enough to pass through the outer screen. That which is not sufficieutly fine is returned upon the inner screen hy inclined chutes leading from the outer to the inner one, aud will again he ground until it is fine onough to pass the outer screen.

HAY AND GRAIN UNLOADERS.—A. G. Crow, Willowe, Cal. Dated Sept. 20, 1880. No. 247,172. This invention relates to certain improvements upon a hay pitcher and stacker, patented Dec. 16, 1879, No. 322,303, and coneists in such peculiar construction as will enahle the implement to elevate the body of a loaded header-wagon, or a rack, or any such receptacle for hay and grain, and throw its load upon a stack or into a barn.

THE Colusa *Sun* wants a tax of $25 a year levied on every pistol.

Copper in Arizona.

(CONTINDED FROM PAGE 241.)

encsd man to "spy out the land." He selected ths best claims to bs found in tho district, and on a portion of thsm they organized a company already well known in ths East as the Old Dominion Copper Mining Co., and on ths others they organized the Borva Copper Miuing Co. Thsn there is the Takoma Co., the Globe, ths Carrio mine, and various others in embryo. I visited those mentionsd, which are the only ones, I helievs, which are being actively or systematically developed.

The Old Dominion

Takes the lead, the devslopments hsiug remarkahls both as to quantity and quality of the orc. It is unquestionably a permanent vein of solid red oxide and green carhonate, interspersed with glance, and averaging hy many assays 35% to 40% copper. It also carries free gold assaying as high as $200 per ton. It is worked hy thres tunnels on the vein and shaft, and winzs connecting principal tuunel with the lower level. This tunnsl has entersd ths hill over 300 ft., and for the last 50 ft. or morc, the vein is wider than the tunnel, growing widsr as they continue on and as they sink to the lower level. They will have two of Prescott, Scott & Co.'s 30-ton smslters on the ground next wsck, and expect to turn out 500 to 600 tons of bullion monthly from November 1st.

Besides this mins, they havs two claims, known as the New York and Chicago, soms seven milee distant, which thcy are working with equal energy, having a tunnel nearly 400 ft. long, shafts of 50 and 100 ft., and their ore is little, if any inferior to the Old Dominion. It differe in character, however, there being less red oxide and more green carhonate and agurite. The ledge is of unprecedented width, varying in the croppings from 10 to over 100 ft. wide.

When looking at these immense veins of ore, averaging over 30% copper in hoth cases, and remsmhering that the Lake Superior ores run from 1% to 6% copper, and that the Copper Queen in Cachise county (thie Territory) averages ahout 15% copper, one is impressed with the possihilities of euch mining property. The company, I learn, have made arrangements to order forward two additional emolters as soon as the first two are fairly running, and repeat this ae the mines are opened.

The Globe Copper Co. hase their hopee on their proximity to the mammoth lode of the Old Dominion company, their claim heing apparently one of the feeders to that lead. As yet, however, there is nothing heyond surface indications. They are sinking a shaft, run down 80 ft. or more, and hope, when they cross-cut, to find the vein. It is hut 60 days since they commenced operations.

Takoma Copper Co.

Have heen at work some six or eight months, and have uncovered near the surface some handsome glance and malachite. In sinking, they find red oxides and carbonates, hut await further developments as to the ahundance of paying ore hefore erecting smelters—a wise policy, and one worthy of imitation, for it takes a good mine to supply a 30-ton smelter day hy day.

The Old Dominion Co. estimate that they have about 1,500 tons from their development work to commence with, and can stope down from present workioge 100 tone a day for months to come. Meau while the mines are heing opened farther. Their capacity six months hence must he something enormous.

The Borva Copper Co.

Have 6,000 lineal ft. on a lead which shows hold outcrop for a great part of that dietance. They only commenced active operations six weeke ago aud already have over 100 tons of ore out from their workings. It is similar in character to the New York and Chicago.

The Carrie

Is a private enterprise. They have a smelter up, hut it has not yet commenced running. Their ore is chiefly green carhonate, and I will leave the emelter to tell the percentage, ae it depende on how well they separate the ore from the rock with which it ie interspersed.

Other copper enterprises are on foot in the vicinity, hut I havo described those most worthy of attention.

Considering how short a time has heen devotsd to opening these mines, the result of two or three of them is remarkahle, and the output of hullion next year may he a eource of surprise to our copper men.

ONE of the counsel retained hy the Government in prosecution of the Star-route cases, says: There has never heen any doubt about obtaining indictments in the Star-route cases. Grand Juries, although drawn pretty much in the same way as petit juries, rarely hold out against the Government, if it has any case at all, and the present Grand Jury is a very fair one, as far as the Grand Juries go.

A PERMIT for a hurial in consecrated ground was refused to a native Protestant at Xochiapa, Mexico, and the corpse lay decomposing for three days. Tbe civil authorities could offer no relief. When the Protestants organized a funeral procession a mob stoned it and threatened further violence, so a secret hurial took place.

ABODT 100 men are now employed by the Emigrant prospecting company, Silver City. The town already hegins to show signs of returning life.

News in Brief.

RIVERSIDE is experiencing a gsnuine boom in real estate matters.

THE loss hy the hush fires on Saugeen peninsula, Ontario, amounts to $500,000.

IT is reportsd that tho building of several sawmills is in contemplation in Del Norte county.

WIMER & SIMMONS of Waldo cleaned up $23,000, as the profits on their spring and summsr run.

THE coinage at various mints for Septsmhsr was $7,847,300, of which $2,400,000 was in standard dollars.

THE Ventura warebouse at the wharf is full of grain. Nsvcr in the history of Ventura county were ths crops so good.

IT IS reportsd that Mrs. Garfield will shortly sell the house occupisd hy the family previous to her husband's inauguration.

THE Santa Cruz Narrow-gauge railroad was sold recently, under foreclosure, to ths Pacific Improvement Co., for $196,000.

IT is said the second largest spring in Hell's Half Acre, near the Yellowstone park, has turned itself into a spouting geyser.

THREE enginssring parties for tho Northsrn Pacific are operating hstwesn the Mullan pass and the mouth of the Little Blackfoot.

THOSANDS of railroad tiss are being floated down the Willamstte to a hoom near McVey's point. Tbey are banked at that place and piled along ths track.

THE profits of the cbief cotton corner in Livsrpnol are estimated from £250,000 to £500,000. But one small failure has occurrsd, and no others are expected.

WHEN the California Soutbern and the Atlantic & Pacific railroads are completed they will have built at least 350 milee of track in San Bernardino county.

CHIEF Engineer Osgood of tbe California Southern Railroad, says that tbe 116 miles of road, beginning at San Diego, would bs completed hy the 1st of January next.

THE Hailey paper, Wood river, Idaho, claims the county seat hy a majority of 28, while the Bellevue *News* says the official count givos it to that town hy a majority of one.

ORSON PRATT, the well-known Mormon apostle, ie dead. S. C. Scoville, who was shot at the meeting of tho Nevada and Orsgon Railroad Company in Reno, Nev., is dead.

A NDMBER of husiness houses in New York have agreed to receive and pack the mourning decorations recently exhihited on the houses, for the henefit of the Michigan sufferers.

THE whaling season at Monterey eo far hse not heen a propitious one for the whalers, as they have not caught a single whale, although several have been noticed outside the bay feeding.

IT is reported that not less than tbrse lines of railroads will reach the vicinitv of Iron springs, Utah, within a year—the Utah Central, the California Ceutral and the Denver and Rio Grande.

IT is said that there etill remains in the Truckee hasin, Sierra Nevada mountains, 5,000,000,000 ft. of timber and 10,000,000 corde of wood, all of which is so situated that it can be brought out to market.

TIMBER experts say tbat thero remains in the Truckee hasin 5,000,000,000 ft. of timher and 10,000,000 cords of wood, in localities availahle to market, with present facilities for transportation and fluming.

THE Brush electric light was put in at Point Blakely, W. T., recently. There are six lights, each 2,000-candle power. The experiment gives perfect satisfaction, and a 16-light machine will he added.

OFFICIAL notice has heen given at St. Petersburg that the importation of galvanic batteries, induction coils and insulated wire will he snhject to the samo rules of inspection and control as the importation of arms.

WE wish to give each week the latest news from all the camps. If our subscribers would send in items occasionally they would help us, and at the same time keep their sections hefore capitalists and mining men.

THE Commission of the General Land Office Saturday transmitted to the Surveyor-General of California for delivery a patent for the Rancho de la Borreas to Marino Castro. The patsnt embraces 4,172 acres of very valuable land in Santa Clara county.

THE superintendent of the Mint at Philadelphia has been authorized to strike off memorial medale having hsade of Lincoln and Garfield on opposite sides. Similar medals are also authorized, containing the head of Garfield on one eide and a wreath on the other.

C. E. DODGE of Riverside lately made a large shipment of fruits to Topeka, Kansas, one lot heing sent for the purpose of heing placed on exhihition at the Kansas State fair during the week just closing. The fruit was received in Topeka in excellent condition.

ALL charges against Gamhetta and others, that the Tunisian expedition was arranged for stockjohhing purposee, will be made the suhjsct of searching investigation in a criminal proescution about to he instituted hefore the Parie Court of Assizes, hy Roustan, French Minister of Tunis, against Henry Rochefort.

THE Russian Minister of the Interior, in his recent circular appointing local Commissions to examine into Jewish questions, says that the Government recognizes the detriment to the Christian population of the commercial activity, exclusiveness and religione fanaticism of Jews, which are still predominant in spite of 20 years efforts to blend tbe two populations.

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North Pacific Coast

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San Francisco Metal Market.

[WHOLESALE.
WEDNESDAY, October 5, 1881.

IRON.—		
American, Pig, soft, ton	— @	30 00
Scotch, Pig, ton	— @	25 00
American White Pig, ton	— @	—
Oregon Pig, ton	— @	26 00
Clipper Gap, White	— @	26 00
Clipper Gap Car Wheel	— @	35 00
Refined Bar	4½ @	8
Horse Shoes, keg	7 00 @	8 00
Nail Rod	— @	9½
Norway, according to thickness	8½ @	9½
STEEL.—		
English Cast, lb	16 @	18
Black Diamond, ordinary sizes	13 @	15
Drill	15 @	18
Flat Bar	— @	16
Plow Steel	15 @	16
COPPER.—		
Ingot	— @	52
Sheet	— @	20
Sheating, Tinned 14x18	— @	42
Nails	— @	—
Bolts	38 @	42
Old	— @	18
Bar	— @	22
Cement, 100 fine	— @	15½
LEAD.—		
Pig	— @	4½
Bar	— @	6
Pipe	— @	8
Sheet	— @	9
Shot, discount 10% on 500 Bags		
Drop, per bag	— @	2 10
Buck, "	— @	2 30
Chilled "	— @	2 50
TIN PLATES.—		
10x14 I C Charcoal	— @	7 50
10x14 I C Coke	6 00 @	6 25
Banca Tin	— @	25 00
Australian	— @	24 00
I. C. Charcoal Roofing 14x20	— @	7 25
" " " 20x28	20 00 @	21 00
ZINC.—		
By the Cask	— @	9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @	10
NAILS.—		
Assorted Sizes	3 50 @	3 75

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

SAN FRANCISCO, OCTOBER, 1, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, dividend No. 33, of seventy-five cents (75 cents) per share, was declared, payable on Wednesday, October 12, 1881, at the office in this city, or at The Farmers' Loan and Trust Company in New York.

WM. WILLIS, Sec'y,
Office—Room No. 20, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company.

SAN FRANCISCO, OCTOBER 4, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 22) of twenty-five cents (25 cents) per share was declared, payable on Saturday, October 15, 1881, at the office of the Company, Room 19, No. 328 Montgomery St., San Francisco, California. Transfer books will be closed on October 10, 1881, at 3 P. M.

JOSEPH NASH, Sec'y.

The Oxford Beta Tunnel and Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Aurora, Esmeralda County, Nevada.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 23) levied on the 20th, day of August, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. Shares.	Amt.
Richard A. Chase	25	50	$10.00
Moses C. Kyes	147	7	1.40
Moses C. Kyes	187	3	60
Dr. A. Farnsworth (unissued)		40	8.00
F. Staehler	225	10	2.00
F. Staehler	255	10	2.00
Dr. B. S. Mason	259	35	7.00
Larkin Smith	261	50	10.00

And in accordance with law, and an order of the Board of Directors, made on the 20th day of August, 1881, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the Auction Rooms of Maurice Dore & Co., 410 Pine St., San Francisco, California, on Monday, the 17th day of October, 1881, at the hour of 10 o'clock, A. M., of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

GEO. H. PECK, Sec'y.
Office—Rooms of Dr Knowles, 118 Dupont street, San Francisco, Cal.

Belcher Silver Mining Company. Location

of principal place of business, San Francisco, California. Location of works, Gold Hill, Storey county, Nevada

Notice is hereby given, that at a meeting of the Board of Directors, held on the twenty-ninth (29) day of September, 1881, an assessment (No. 28) of one dollar ($1) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 8, No. 327 Pine street, (Stock Exchange Board Building), San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the first (1) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the twenty-fourth day of November, 1881, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors

JNO. CROCKETT, Sec'y.
Office—Room 8, No. 327 Pine St., (S. F. Stock and Exchange Board), San Francisco, California.

Newcastle Gold Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Yankee Hill Mining District, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Twenty-third (23) day of September, 1881, an assessment, (No. 2) of two (2) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 33, No. 318 Pine St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the First (1) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Twenty-first (21) day of November, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

E. G. MATHEWS, Sec'y,
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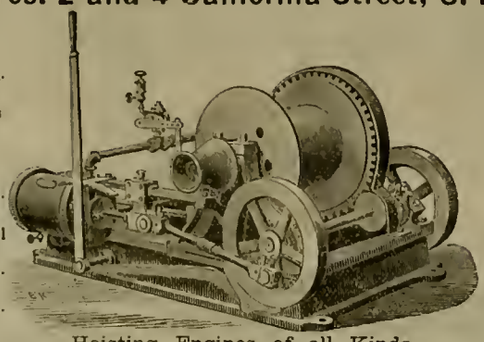

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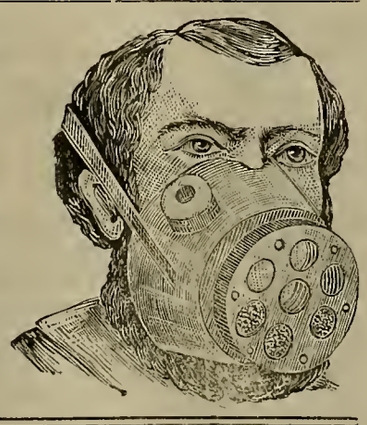

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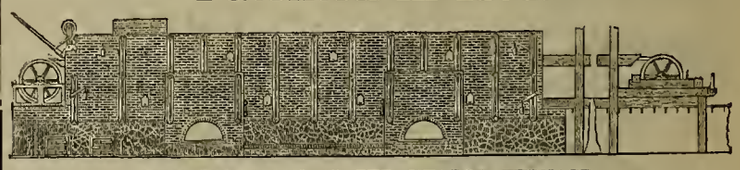

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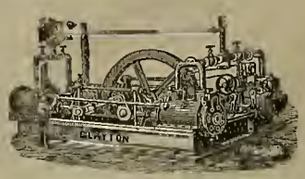

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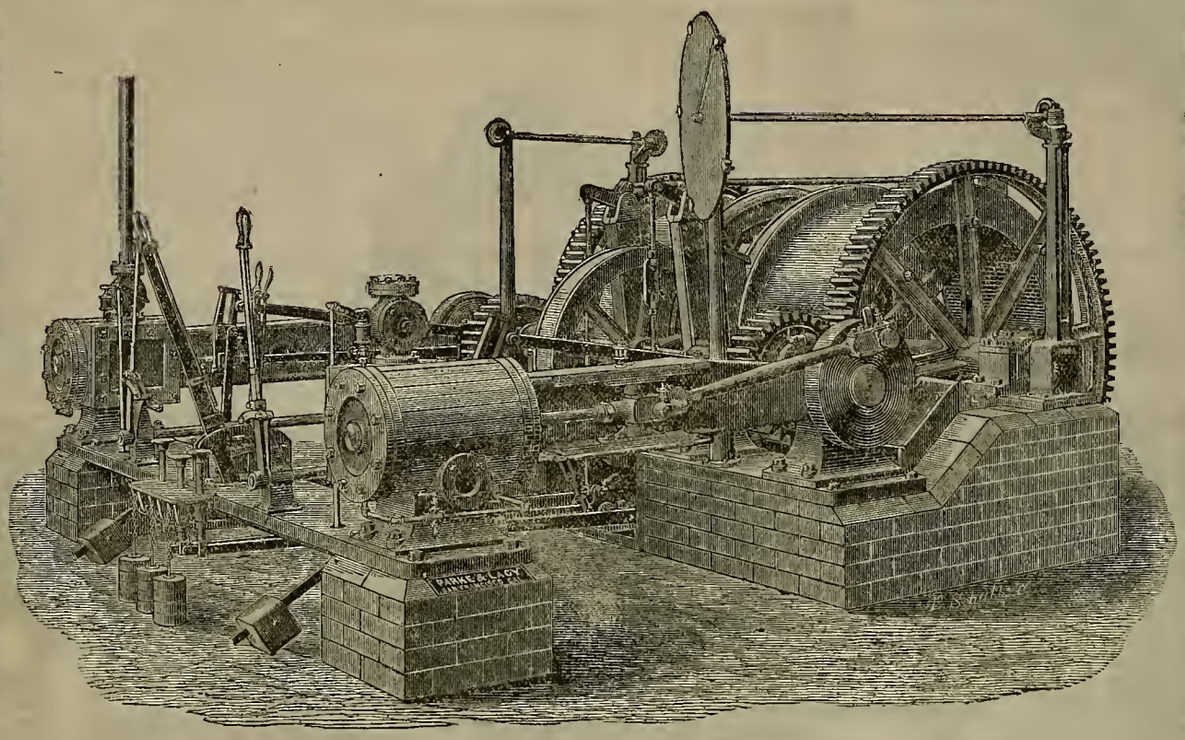

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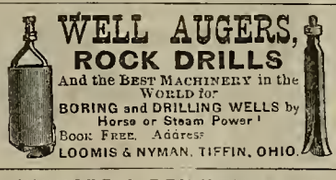

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, OCTOBER 15, 1881. VOLUME XLIII Number 16

The Hydraulic System of Draining Mines.

The hydraulic system of draining mines, as applied to the Chollar, Norcross and Savage mines on the Comstock, has attracted great attention among mining men, as so much depended on its proper working. Some portions of the castings were not sufficiently heavy when the system was first tried, and several breaks and delays occurred. These accidents caused many to believe that the system was a failure, but they were due to defects in minor details, not in the general plan. The pumps have now been some months at work successfully, and their workings have set at rest all doubts as to the success of the hydraulic system. The machinery was designed and built at the Risdon Iron Works in this city.

R. S. Moore, the son of Mr. Joseph Moore, superintendent of the Risdon Iron Works, graduated from the University of California a few months since, and at that time read a thesis on the hydraulic system of draining mines, describing not only the system, but making all the mathematical calculations necessary in its construction, and carefully considering the most essential points arising during the operation of the system. This thesis is a most scholarly production, far above the ordinary papers read on such occasions. The subject itself was an unusual one, and it was treated in a masterly manner. It may be stated here, by the way, that young Mr. Moore is now hard at work at his trade at the Works, and with his practical experience and scientific knowledge, will, no doubt, in time, achieve a reputation for skill in mechanics equal to that his father now enjoys. By permission of young Mr. Moore, we extract from his thesis that portion describing the system in general:

To all those who have watched the progress made within the past few years in developing and prospecting the deep quartz mines of the Pacific coast, this hydraulic system is at once familiar. But for the information of those who have paid little or no attention to this matter, I will state briefly the reasons for its adoption upon this coast.

In the earlier days of mining in this country, neither great depths nor great quantities of water had to be dealt with, and a simple water wheel, generally a hurdy-gurdy, driven by a small jet from some high head, was the prime mover. A pump-bob of the simplest construction and a bucket-lift, all of wood, completed the pit-work. Many a rig like this may be seen running yet, where placer diggings are being worked.

As the mines increased in depth and larger quantities of water had to be raised, larger engines and heavier gears were necessary to do the work, and as these depths became very great, the weight of the pit-work increased enormously, until finally the rate of speed, which is determined by the weight of the mass set in motion, had to be decreased beyond all practical working limits.

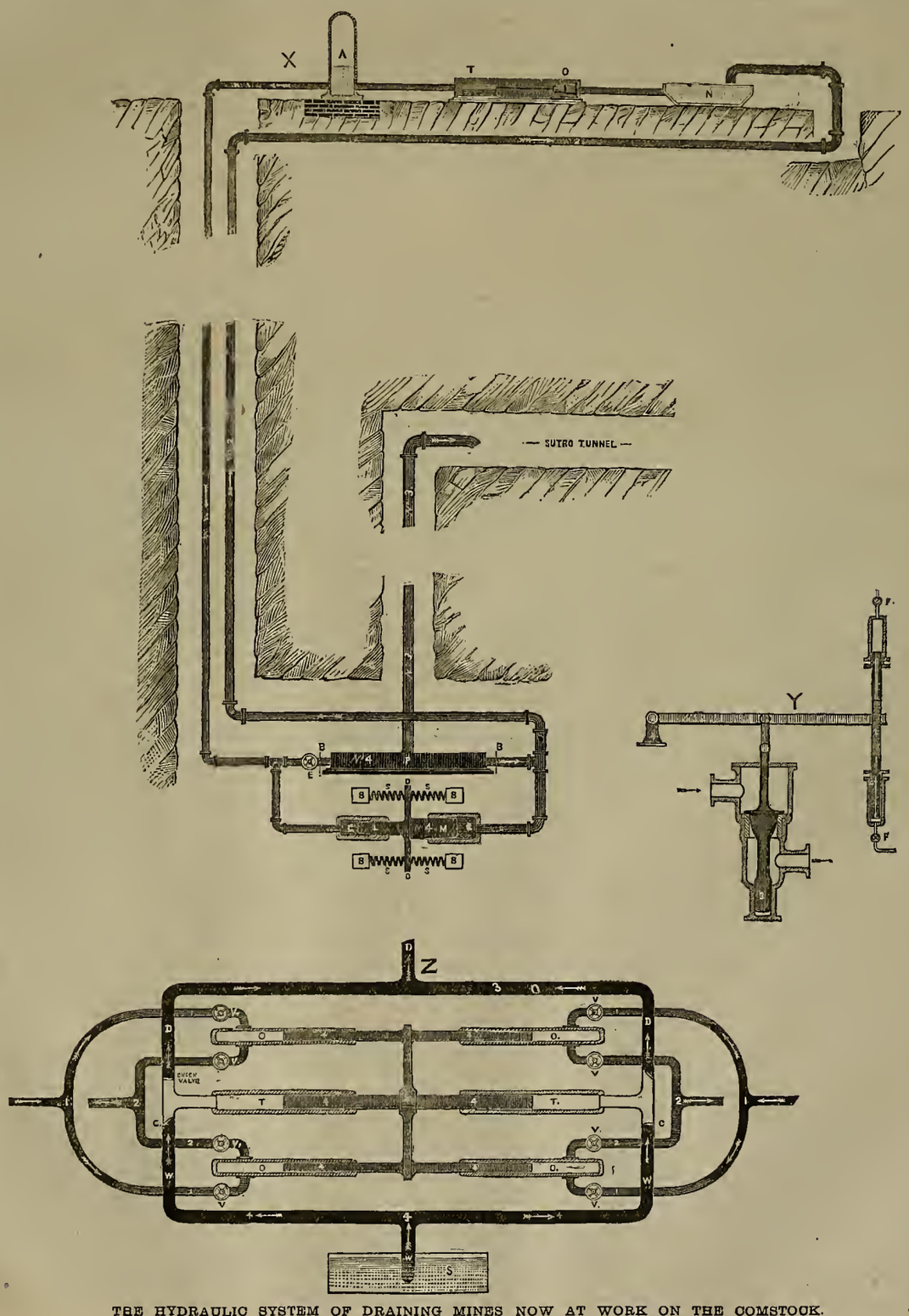
The question then presented itself: What system of pumping can be adopted that will meet all the difficulties that are ever present where heavy pumping works have to be constructed, and that will also meet the peculiar difficulties that have to be encountered in developing the great gold and silver bodies of ore that lie within the bosom of the Sierras?

The mining engineers of the coast differed in opinions. Plans of a hydraulic drainage system, which would do away with all kinds of pump-rods and pit-work, were now prepared, but owing to the fact that the system had never been tried, excepting in Europe, where mines of small depths had been drained, these plans were not accepted and the old style of pumping still adhered to.

Last year, however, the managers of the Combination shaft in Virginia City adopted this hydraulic system, and at the present writing bids fair to revolutionize the draining system of the Pacific coast.

By referring to the drawings of the general plan, it will be seen that the mine to which this system is applied, is 2,400 ft. deep, also that the water to be pumped is to be raised from the 2400 level to a hight of 800 ft. and discharged into the Sutro tunnel, through which it is run off. Upon the 2400 level is erected a pair of hydraulic pumping engines (marked *P* in the drawing) which receive their pressure water through supply pipes from the surface. By these two pumps (as will be fully explained hereafter) the drain water is raised through discharge column to Sutro tunnel, and the water used in doing the work of pumping is sent back through the return pipe to a reservoir, *N*, on the surface. Upon the surface there is a cast-iron accumulator, *A*, which is 60 ft. high and 25 inches in diameter. In this accumulator there are but 20 ft. of water, the remaining space being occupied by air

This air is kept constantly at a certain



THE HYDRAULIC SYSTEM OF DRAINING MINES NOW AT WORK ON THE COMSTOCK.

(CONTINUED ON PAGE 256.)

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Mines and Mining on the Klamath—Hydraulic Operations.

EDITORS PRESS:—What you say in your issne of September 24th about good opportunities for engsging in hydranlic mining along the Klamath river is correct. The few companies at work here, operating for the most part with imperfect appliances and in a small way, are all doing well, as they always have done. These companies along this part of the river are the Woods, Bailey, Mucamuc, Del Norte or Richardson, Furguson & Frazier, Reeves, China Creek and the Gordon & Lane, besides a number of smaller claims which, depending on the gulch water near by, are able to run for only a short time every year. At Wingate hill, eight miles below here, and at Bunker hill, eight miles still farther down, several prosperous bydraulic mines are being worked, some of them on what, for this section of country, may he considered a large scale. A number of mines at Indian creek and Classic Hill have also done well this season.

An Isolated Region and an Unprogressive People.

That hydraulic mining is not here conducted on a more extended plan is because of the non-progressive ideas of those engaged in the business, and who, notwithstanding the improvements introduced elsewhere, still carry it on in a restricted and primitive way. And this, not because we lack here the auriferous gravel, the outlet, water, or any of the other olements essential to large and profitable operations. On the contrary, these are all here present to a greater extent than usual—they may he said to exist to an eminent degree; that they have not heen more largely availed of heing due solely to the cause above mentioned.

Why this indnstry has remained so backward here is owing to a variety of causes, such as our remote and isolated position, deterring the introduction of more recent improvements and preventing the investment of capital in our mines. Time and cost of freights and travel considered, this section of country is as distant from San Francisco as Salt Lake City or Tucson, and nearly as far off as Denver, Colorado. Not until the past few years did any railroad come within 350 miles of this camp, the nearest point on any heing now 200 miles away. This has heen a great detriment to the mines, keeping out the agents of moneyed men as well as the promoters of new ideas, methods and devices.

Then, our population being comparatively sparse, the mines here have not heen depleted as rapidly as in the more accessible and densely populated districts of the State. Claim owners having been able to make good wages working on a limited scale, and with the cruder implements of earlier times, have not beeu forced nor bave they sougbt to expand operations or substitute for their mediocre apparatus, others of more modern and effective patterns.

To illustrate, while we have water in good supply, the ditches are mostly short and small, very few of them delivering their water under a pressnre of more than 100 ft., the pressnre in most cases being much less. Great quantities of water that could easily be brought upon the mines are suffered to run to waste, while thousands of acres of good gravel lie unused and even unclaimed. Some claims after having heen outfitted and supplied with water, are run only dnring the dsy, reducing production to the extent of a third or more. The most of the sluices are short and narrow, and I do not think a single undercurrent has ever yet been put in along the river, such is the inefficient and shiftless manner in which hydraulic mining has heretofore heen carried on in this part of the country.

That the hydraulic miners here are so much behind the times finds its explanation in part in the fact that ours has not heen a migratory population, Siskiyou and Del Norte having suffered hut little from the Frazier river, Washoe and similar excitements as compared with most of the other mining counties of California. The early residents of this section have mostly remained where they were, the majority of our miners having beeu here from 25 to 30 years. Not having left and returned, as has heen so much the custom elsewhere, they have not brought in and rendered available the many new inventions and improved modes elsewhere in use.

Something Gained by the Stay-at-Home Policy.

On the other hand, while our miners have so foregone the benefits of these more advanced methods, they have, by reason of the economy of money and time, effected through this etay-at-home policy, managed to possess themselves of extensivo and valnable mining properties, the most of them having meantime accumulated some ready cash and a few become quite rich. Out of this condition of things has grown not only an indifference to these moderu improvements and an unwillingness to engage in new enterprises, but also a general disposition to sell out their possessions here and betake themselves to other localities, where, after eo many years of isolation, they can enjoy more of the comforts and privileges incident to older communities. Hence the numerous good openinge here, as stated in your article, for tbe investment of money in hydraulic mining.

What you say of the favorable conditions that exist here for the prosecution of that business is true enough, and will he more than sustained by the actual facts. I do uot mean to say that the field here is a very broad one, but so far as it extends it is certainly most inviting; so much so that gaining publicity tbrough such articles as that in the PRESS, it may be expected to meet with wide appreciation and be early availed of.

River-bed Mining.

Of wbich there is a good deal being done along both the Klamath and Scott rivers, has been well prospered the present season, a great deal of gold having already been taken out, with the most and the best part of the season yet to come. This branch of mining is carried on by means of wing damming, these structures heing run out about half way across tbe river and then carried down the stream for 1,000 ft. or more. When finished they inclose a large body of water, which is pumped out hy means of huge wheels attached to long shafts projecting beyond the wing dams and revolved hy the current, these wheels also lifting the water that afterward seeps into the pit.

As little or nothing can he done towards building these dams till the water goes down in the summer, work once commenced has to he driven ahead with all possible expedition, since, with the rise of the river in the autumn, there is an end of operations for the season, the period of gravel extraction hardly ever extending over two and a half moutbs or three at the most. While it lasts every hour is improved, relays of men heing kept busy day and night. The gold hearing material is raised from the pits with derricks or carried out in wheelbarrows and emptied into the sluicee prepared for receiving and washing it, this stuff, where the pits are not too deep, heing thrown up into the sluices with shovels. As many large bowlders are apt to he encountered in excavating these river beds, powerful derricks are required for lifting and swinging them around out of the way, these bowlders heing sometimes piled up on the banks of the pits to a hight of 50 or 60 ft., and covering many acres.

Although the cost of opening and working one of these river-bed claims is great, they never fail to pay well if tbe season proves favorable—the quantity of gold dust taken out hy some of these companies boing large. In some cases the value of the gold extracted in a single season amounts to as much as $200,000, a large proportion of which usually cousists of net profits.

As it is the custom with this class of miners to continue operations till a rise in the river puts a stop to them, they are apt to loose their wing-dams, wheels, pumps, and even tbeir flumes and derricks every fall, the stream rising suddenly on them and carrying all away. And thus it happens tbat, with each recurring summer they have to rebuild tbe whole, a tbing they could not afford to do wore not their yearly earnings very large. OLD SETTLER,

Happy Camp, Del Norte Co., Sept. 27, 1881.

Tunnel Sites and Blind Lodes.

The Commissioner of the General Land Office has decided that the requirements of location and notices of a proposed tunnel apply only where blind lodes are sought to be discovered. And be has also decided that where a party runs a tunnel to develop a known lode, already discovered and located, notice of such intention is not required, and a tunnel location nesd not be made.

The decision in full is as follows:

GENTLEMEN: I have examined the protest submitted hy M. D. Cooper against the issnance of patent to Henry M. Hoyt *et al.* for the Mark Twain lode and mill site, lots 344 A and B, situatsd in Mt. Sneffel's mining district, Ouray County, Colorado, and embraced in mineral entry No. 190, of the series of your office.

The record of said entry shows that the Mark Twain lode was duly located, and that the possessory title is vested in the applioants for patent. The application for patent was filed in your office April 30, 1880, due notice of which was given in the manner prescribed by law, the period of publication expiring Septemher 4, 1880. February 3, 1881, the claimants entered and paid for the land.

Mr. Cooper alleges that during the year 1880, no work whatever was performed upon the Mark Twain lode, and that on the 22d of January, 1881, he made a re-location of the same under the name of the Ida City lode.

Protestant further allegee that "said H. M. Hoyt *et al.* attempted to develop eaid Mark Twain lode by rnuning a tunnel on the Wheel of Fortune lode (a claim owned by Hoyt *et al.*), a claim or lode distant from said Mark Twain lode about 1,200 ft., and lying at right angles with the said Wheel of Fortune lode, the eaid H. M. Hoyt *et al.* not heing owners of the lode or surface ground intervening * * * for the development of said mine or mines," etc.

By an act of Congrese approved February 11, 1875, it is provided that "where a pereon or company bas or may run a tunnel for the purposes of developing a lode or lodes owned hy said person or company, the money so expended in said tunnel shall he taken and considered *as expended on said lode or lodes*, whether located prior to or since the passage of eaid act (May 10, 1872); and sucb person or company shall not he required to perform work on the surface of said lode or lodes, in order to hold the same as reqnired by said act."

Protestant admits that a tunnel bas been commenced on the Wheel of Fortune lode snd run for the development of tbe Mark Twain lode, and that a sufficient amount has been expended upon or in said tunnel to maintain the possessory title to said lode during the year 1880; hut contends that such expenditures cannot be held to apply to said lode, because the line of said tunnel was not located and marked upon the surface of the ground by stakes; hecanse no notice was posted at the mouth or face of such tunnel, describing the purpose for which it was run; and because no copy of such notice was filed for record with the Mining Recorder, etc.

Inasmuch as there is notbing in the law or instructions of this office requiring these things to be done, I fail to perceive the force of the reasons assigned. When a tnnnel is run for the purpose of discovery of "hlind" lodes, under the provisions of Section 2323 R. S., it is proper, and the regulations require, that due notice of such tunnel shall be given, in order that other persons may not prospect for lodes along the line of such tunnel, which by law are vested in the tunnel claimants so long as they shall prosecute the tunnel with due diligence.

But thsse instructions are not applicable to tunnels run in accordance with the act of February 11, 1875, for the purpose of developing lodes already discovered and located. Indeed, said instructions were promulgated long prior to tho passage of said act, and there exists not the slightest reason why any notice whatever should have beeu given to the world as to the manner in which the claimants proposed to develop their claims, as the rights of third parties could not by any possibility he affected therehy.

Admitting all that is alleged hy protestaut, there appears to be uo reason why patsnt should not issue to the applicants.

The protest is herehy dismissed.

J. A. WILLIAMSON, Commissioner.

Electricity in Agriculture.

It is only fitting that agricnltnre should share in the present interest in electrical appliances and machinery, and that while the manufacturer is promised cheap power and the transportation companies cheap motors, the farmer should bave some encouragemsnt that perhaps some day he may plow and rsap and thresh with lightning rather than horseflesh or steam. Such indeed is the present promise, and it adds interest to the promise to know tbat be who makes it, Dr. Siemens the leading Englisb electrician, is in fact a country gentleman and is actually training his newly contrived devices to do horticultural and agricultural work.

The last official announcement of what Dr. Siemens has accomplished and bopes yet to attsin is fonnd in an address he delivered last month before the Royal British Association for the Advancement of Science, of which reports come in our last London oxchanges. His experiments and their results are too extended for us to reprodnce them in detail, but we shall endeavor to catch a few of the leading concln-sions and achievements whicb will show tbe direction of progress in this field.

First, we may remark that Dr. Siemens has experimented in two main lines at least. One is to test the effect of the electric light upon the growth of plants; the other is to make the motive power of electricity available for ordinary farm work. In the first attempt that of growiug plants qnite remarkable results have been attained; in tbe second there are some satisfactory results and some splendid promises. In growing plants hy the electric light, Dr. Siemens met with some failures at first, for he soon fonnd that there must he some rules observed in the manner of admitting the light, etc. His arrangements and appliances consisted of a high pressure steam engine of six-horse power nominal, which gives motion to two dynamo machines connected separately to two electric lamps, each capable of emitting a light of abont 4,000-candle power. One of these lamps was placed inside a glass house of 2,318 cubic ft. capacity, and the other was snspended in the open air at a hight of 12 to 14 ft. over some sunk greenhonses. The waste steam of the engine was condensed in a heater, whence the greenhouses take their circulating snpply of hot water, thus eaving the fuel that would otherwise he required to heat the stoves. The experiments were commenced on Octoher 23, 1880, and were continued till May 7, 1881. The general plan of operation consisted in lighting the electric lights at first at 6 o'clock, and during the short days at 5 o'clock, every evening except Sunday, continuing their action until dawn. The results of thie treatment with different seeds and plante were as follows: Peas which had heen sown at the end of Octoher produced a harvest of ripe fruit on February 16th, under the influence, with the exception of Sunday nights, of continnous light. Raspberry stalks put into the house on December 16th produced ripe fruit on March 1st, and strawberry plants put in about the same time produced ripe fruit of excellent flavor and color on February 14th. Vines which broke on Decemher 26th produced ripe grapes of stronger flavor than usual on March 10th. Wheat, harley and oats shot up with extraordinary rapidity under the influence of continnous light, but did not arrive at maturity; their growth having heen too rapid for their strength caused them to fall to the ground after having attained the hight of about 12 inches. Seeds of wheat, harley, and oats planted in the open air and grown under the influence of the extsrnal electric light produced, however, more satisfactory results; having heen sown in rows on January 6th, they germinated with difficulty on account of frost and snow on the ground, but developed rapidly when milder weather set in, and showed ripe grain hy the end of June, having been aided in their growth hy the elcctric light until the heginning of May. Douhts have been expressed hy some botanists whether plants grown and brought to maturity under the influence of continnous light would produce fruit capable of reproduction; and in order to test this question, the peas gathered on February 16th from the plants which had heen grown under almost continuous light action were replanted February 18th. They vegetated in a few days, showing every appearance of healthy growth.

The effect of the electric light uhon the size and quality of the fruit produced is striking. Dr. Siemens describes especially the heneficial influence of the electric light has been very manifest npon a banana plant, which at two periods of its existence—viz: during its early growth and at the time of the fruit development—was placed (in February and March of 1880 and 1881) under the night action of one of the electric lights, set behind glass at a distance not exceeding two yards from the plant. The result was a hunch of fruit weighing 75 lbs., each hanana heing of unusual size, and pronounced hy competent judges to he unsurpassed in flavor. Melons, also, remarkable for size and aromatic flavor, have been produced under the influence of continuous light in the early spring of 1880 and 1881, and Dr. Siemens is confident that still hetter results may be realized when the best conditions of temperature and of proximity to the electric light have been thoroughly investigated. His object hitherto has rather been to ascertain the general conditions necessary to promote growth hy the aid of electric light than the production of quantitative results; hut he is disposed to think that the time is not far distant when the electric light will be found a valuable adjunct to the means at the disposal of the horticulturist in making him really independent of climate and season, and furnishing him with a power of producing new varieties.

During the day-time Dr. Siemen's was obliged to keep up the fires under his boilers to secure steam, to maintain the temperature in the greenhouses. He saw that he could then use the energy to prodnce electrical power for work, when it was not needed for light. In order to utilize this power he devised means of working the dynamo machine also during the daytime, and of transmitting the electric energy thus produced by means of wires to different points of the farm where such operations as chaff-cutting, swede slicing, timher sawing and water pumping have to he performed. These objects are accomplished by means of small dyuamo machines, placed at the points where power is required for these varions purposes, and which are in metallic connection with the current-generating dynamo machine near the engine. The connecting wires employed consist each of a naked strand of copper wire, supported on wooden poles, or on trees, without the nse of insulators, while the return circuit is effected through the park railing or wire fencing of the place, which is connected with hoth transmitting and working machines hy means of short pieces of connecting wire.

All these details of work with the electric apparatus, Dr. Siemens says were under the charge of his head gardener, assisted hy the ordinary staff of under gardeners and field laborers, who probably never before heard of the power of electricity. Electric transmission of power may eventually be applied also to threshing, reaping and plowing. These objects are at the present time accomplished to a large extent hy means of portable steam engines, a class of engine which has attained a high degree of perfection, bnt the electric motor presents the great advantage of lightness, its weight per horse power heing only 2 cwt., while the weight of a portable engine with its hoiler filled with water may be taken at 15 cwt. per horse power. Moreover, the portable engine requires a continuous supply of water and fuel, and involves skilled labor in the field, while the electrical engine receives its food through the wire (or a light rail npon which it may he made to move about) from the central station, where power can he produced at a cheaper rate of expenditure for fuel and labor than in the field.

THE PARIS ELECTRICAL EXHIBITION has proven one of the most successful and at the same time the most remarkable special exhibit ever undertaken in any country. The *Scientific American* thus refers to it: "Upward of 1,800 exhibitore have contributed to thie pioneer display of the applications of electricity to scientific, industrial, and domestic affaire; and it is noticed as a significant indication of the rapidity of modern progress that the exhibition of a single scientific industry, and that a comparatively new one, should require more space than sufficed for an entire international exhibition of the arts and sciences a quarter of a century ago. The Palais de l'Industrie, with its 45,000 square meters of space, was ample for the World's fair of 1855. It is now crowded with electrical exhibits, and many pavilions of wood and iron have been erected around it for the additional epace required."

MECHANICAL PROGRESS.

The Degeneration of Steel.

What a superb career steel has renounced. It had shaped the world; it had carried out history and formed the nations; it had taxed the limits of languages, and the geography of character and thought; it had vanquished the strong; it had rebuked the proud; it had succored the weak; it had been the arbiter of honor and the accomplisher of justice. The sword was, as the ancient chronicler said, the oldest, the most universal, the most varied of arms, the only one which has lived through time. All peoples knew it; it was everywhere regarded as the support of courage, as the enemy of perfidy, as the mark of commandment, as the companion of authority, as the emblem of sovereignty, of power, of force, of conquest, of fidelity, and of punishment. And all this has steel abandoned—to become rails. Look at what it was, and what it is. Its aspect was brilliant; its habits were punctilious; its manners courtly; its connections were patrician; its functions were solemn; its contact was ennobling; even its very vices were glittering, for most of them were simply the defects of its superb qualities. It is true that it was sometimes cruel, and that its processes of action were distinctly sanguinary, but these reproaches apply to all other weapons, too. Throughout the ages it grandly held up its head and haughtily bore its name. It lost no caste when it allied itself with lance and dagger, with battle-ax and holm, for they were of its natural kindred; and even when, in later times, it stooped to generate such lowly offspring as razors, lancets, knives and needles, the world saw no real abasement in the act, for the chivalrous blade was still the image which represented steel to man. But now the whole character has changed; now, it has thrown aside its gallantry, its grace, its glory; now, it has forsworn its pride for profit, its pomp for popularity.

Steel is now bursting coarsely on the earth at the rate of thousands of tons a month. It is positively made into steam engines, and cannon, and ships, and all sorts of vulgar, heavy, uncomely, useful objects. Worse than all, it is becoming cheap! Steel cheap! The steel of old, the steel of legend and of story, the steel of the paladin and the chevalier, the steel of the noble and the brave, the steel of honor and of might, the steel that was above price, that knew not money, and cared naught for profit—that steel is no more. It has been driven contemptuously out of sight by metallurgical persons called Bessemer, Krupp and Siemens, and these destructive creators have put into its place a 19th century substance exactly fitted to a mercantile period, but possessing no tie whatever between time or fame.

No more steel will append its personal signature, its gloriously recognizable autograph, to the great events of history. The dagger that slew Cæsar, the glaive that Brennus hurled into the scale to weigh against the liberty of Rome, the ax that gashed off Mary Stuart's head, the knife that armed the hand of Charlotte Corday—of course they were not all steel, but they admirably represent the notion of it—are mere faded antiquities. Steel has other functions to discharge now; it has given up marking dates in the world's life, and has gone in for trade; it has ceased to be history, and has become actuality; it is in a state of new departure; it no longer incarnates a sentiment; it is nothing but a fact. It has turned its back on the blades of Damascus, on the armor of Milan, on the shields of Augsburg, on the rapiers of Ferrara, on the halberts of Flanders, on the poignards of Bilboa, and at this very moment is forsaking almost the last refuge which was left to it, and is deserting the marvelous sabers of Japan. In the place of its former glories it is taking up all sorts of low associations; it is being manufactured in big furnaces; it is being "cast," as if it were mere clowish pig iron; it is being rolled, as if it were uncouth "bar;" it is condescending to be boiler plates, and axle-trees, and driving shafts, and girders. To this is steel reduced.—*Blackwood.*

VARIATIONS OF BELT SPEEDS.—From experiments made, it has been ascertained that about two revolutions per hundred are lost in the transmission of motion by a belt. In ordinary practice this would be a slight loss, and would in no wise interfere with the usual manufacturing processes; but where there is a long train of gear repeated from shaft to shaft by belts, the loss becomes serious. It is clear that if the coefficient of loss by shippage be .98 for a single pair, which has been verified with great certainty by varying the tensions of the same belt, it will become equal to the successive powers—.98, .96, .94, .92, .90, and so on—so that after a succession of five speeds, the loss amounts to one-tenth of the calculated speed, and that at the end of 34 speeds the velocity will be reduced to half. From these considerations it appears that where it is required to transmit speeds as near determinate as may be, by means of hands and pulleys, it is necessary to increase the diameter of the driving pulley by its fiftieth part, or diminish the driven pulley in the same ratio.

TO MAGNETIZE A STEEL BAR.—A steel bar held in the direction of a magnetic needle, and struck several blows with a hammer will become magnetized.

Metallurgical Patents.

Among the patents granted at Washington on the 13th ult. was one to Paul Anbe, of Paris, France, for a new method of making steel. A patent for the same was granted him in France on February 14, 1881. Following is the inventor's claim: "The method of cementing iron, which consists in subjecting the iron to heat in a retort in company with substances, as described, which under heat develop hydro carbon gas and nitrogen with or without carbonaceous matter, as described, the subjecting the metal to an acid bath, and finally, at the described temperature, to dry hydro carbon gas, substantially as and for the purpose set forth."

At the same date a patent was granted to Jacob Reese, of Pittsburgh, for a "process of producing a metal high in phosphorus and carbon and low in silicon." Mr. Reese's claim is as follows: "1. The method of producing metal high in phosphorus and carbon and low in silicon, which consists in smelting iron ores in a blast furnace with suitable charges of limestone and phosphoretic basic slag to flux the metal and charge it with phosphorus to the desired degree, and then treating the metal high in carbon, silicon and phosphorus so produced in a silicious-lined open-hearthed furnace, to reduce the silicon, whereby a metal high in carbon and phosphorus and low in silicon is produced, substantially as and for the purpose hereinbefore set forth. 2. The method of producing metal high in phosphorus and carbon and low in silicon, which consists in smelting iron ores with suitable charges of coke, limestone and phosphoretic basic slag in a blast furnace and then running the molten metal into a silicious-lined open hearth and treating it therein until the metal begins to boil and the elimination of the carbon commences, whereby a metal high in phosphorus and carbon and practically free from silicon is produced, as and for the purpose hereinbefore set forth. 3. As a new article of manufacture, cast iron or pig metal high in carbon and phosphorus and containing not more than one-half of 1% of silicon, substantially as herein specified."

The Modern Uses of Steel.

At present there is but one sound reason why steel should not universally replace iron with advantage, and that is, that in some cases it is cheaper to employ iron. Statistics show us that the enormous quantities of steel now manufactured have hut little, if at all, affected the production of wrought-iron. It is, however, I am convinced, hut a question of time. When the day comes—and every day brings us nearer to it—when steel will be manufactured as cheaply as iron, then will wrought iron be a thing of the past among the great civilized nations.

One word as regards the employment of steel made by these modern methods of entlery. Cutlery manufacturers would tell you that it is useless for the purpose; nevertheless, on the Continent, it is very largely used, and in this country to a considerable extent. I do not hesitate to assert that, with suitable ores and proper care in the manufacture, steel well suited for cutlery can be made both in the open-hearth and the converter. An essential in the ore is that it should not contain phosphorus; with but a trace of phosphorus present, a good cutting edge could never be obtained.

If we glance back for a moment to review our history, we shall see that the open-hearth processes embody the same principle as the first process by which steel was produced, viz., the mutual action of carburized iron and oxide of iron on one another, and the Bessemer process is, after all, though a splendid offspring, only the natural descendant of the finery process, the origin of which, as we have seen, was due to modifications in the primitive blast-furnaces. There is perfect continuity throughout, and, after all, what more natural?—*Prof. A. K. Huntington, in Popular Science Monthly.*

Friction.

So eminent an authority as Prof. Sweet, says in reference to the question of economy by reduction of friction, that of two systems, one saving 10% by reduction of friction, and the other 20% in the use of steam, he would take that which led to a saving in friction, which of necessity implies saving in maintenance, attendance, repairs, delays, etc. This loss by attendance, repairs and delay is greater in small engines than in large ones. To get economy in friction there should be generous wearing surfaces, well fitted and properly lubricated, and the engine should be in absolute alignment. We often find shafts that are set in perfect line and remain so when at rest, but which are deflected by the strain put upon them while at work.—*Manufacturer and Builder.*

STEEL BOAT.—James Rees, of Pittsburgh, in speaking of the steel boats of the past and future, says the structure will now be made entirely of steel. Formerly, iron boats were built. Then iron frames with steel plates, steel having more strength than iron, with about half its weight. Now plates and frames are of steel, which further adds to the lightness, a desideratum where this style of light-draught boats are used. The one they are now building to run on the Chattahoochie river is of the latter description.

THE friction of a belt is double as much on wood as it is on cast iron.

SCIENTIFIC PROGRESS.

Galvanic Deposition of Iron.

Printing plates of stereotype metal, and especially those of copper (made by electrotyping), have a surface sufficiently hard and resistent to wear, to give many thousand impressions in the printing press before they show signs of wear—that is, where they do not suffer rough usage; and they are so cheap that there is hardly room for any material improvement upon them. Nevertheless, while we do not think much of our correspondent's suggestion to use iron-faced plates for printing, as a substitute for those before named, we readily accede to his request to know if any methods have been devised to deposit a galvanic coating of iron. Several such plans have been proposed, and we give the more important of these below. Boettger, in 1846, described a process for obtaining galvanic deposits of iron, and employed for this purpose a solution of two parts of sulphide of iron and three parts of sal-ammoniac. Klein improved upon this by using sulphate of ammonia for the chloride. As an anode he used an iron plate, but explains that he found it expedient to connect this with a copper plate. He found the deposits he obtained were very hard and brittle; but he succeeded in rendering them ductile by heating them to a red heat. Varrentrapp recommends that an iron wire be connected with the iron anode, and that the anode and cathode be brought within four or five inches of each other. He employs as his solution four parts (by weight) of green vitriol and three of sal-ammoniac, in 30 parts of water. When metal molds are used, he suggests that they be first silvered, and then given a yellow coating of sulphide by the action of sulphureted hydrogen, which allows the iron shell to come away freely. The current should be weak and constant to obtain the best effects.—*Manufacturer and Builder.*

ELECTRICITY APPLIED TO BALLOONS.—A late number of the *London Times* says: On Saturday last the Balloon Society inaugurated their session by meeting at Lillie Bridge, West Brompton. An address was given by the President, Mr. W. H. Le Fevre, C. E., on an electrical stationary balloon patented by M. Jules Goddard and M. de Fonvielle. A new application of electricity was about to be made, which, it was true, did not enable one to propel a balloon, but by which the system of aerial navigation would be considerably improved. The first step to be taken in making a balloon stationary was to prevent its gyrating. MM. Goddard and de Fonvielle had overcome this by means of a disk somewhat similar to the face of the compass placed in the center of the car poised on a vertical axis. When one side of the car was lower than the other, the disk or plate became instantly affected. An electric current was instantaneously transmitted to a magnetized point immediately opposite, which had a contrary effect, and placed the car in equilibrium. The Plante-Faure battery which produced the electric current would at the same time act on a small shaft running at the bottom of the car and turn a small screw. The balloon would thus neither ascend nor descend. This principle had been carried out successfully and practically recently on a small scale, and, he believed, would come into general use in a very short time. He considered that this was the most extraordinary discovery in connection with the storage of electricity that had ever been made. The result would be that the law of gravitation would be overcome, and that we should be able to suspend a body in the air at any altitude and in any position.

THE COMING GLORY OF SCIENCE.—Edward Atkinson indulges in a vision to this effect: If we can send thought and light over a wire; and if we can attach to the same post another wire by which to transmit electric power, so that every farmer may keep a small thunder-storm on tap in his barn to cut his fodder, milk his cows, and churn his butter, split his kindling-wood, and do all the heavy work and choring about the house; in short, if we are to accomplish here what is now being done in France, that is, operate an electrical machine by a small water-power on the farm, and run the plows, harrows, harvesters and threshers by electricity—if these things begin to be apparent, that are so bewildering that one even gets considerably mixed up in attempting to describe them, and is not quite sure what relation his parts of speech bear to each other—why, then, perhaps the millenium of the economist is nearer at hand than it has been supposed to be; "the time when intelligence and integrity and a very moderate amount of labor will insure so good a subsistence that it will not pay to be rich."

A NEW METAL.—M. Delafontaine, in 1878, communicated to the *Academie des Sciences* the discovery of a new metal in the mineral "samarskite," to which he gave the name "decipium." In the *Comptes Rendus* for July, M. Delafontaine states that he finds his "decipia" of 1878 to be a mixture of two new oxides, one of these being the radicle of the earth, found also by M. Locoq, and to which that chemist gave the name of "samarium," the other being his own "decipium." These names it is proposed to adopt in future.

The Density of the Earth.

Efforts have been made, at all times in which the spirit of investigation can be said to have existed, to ascertain the condition of the interior of the earth. There has been no lack of unfounded assumptions on the subject, and fanciful hypotheses were held even down to a period in which correct conclusions had been reached upon it—to the beginning of the 19th century. Alexander von Humboldt relates that he and Sir Humphrey Davy were several times invited by Capt. Symmes to join an expedition into the interior of the earth, which was represented as a hollow sphere having a large opening at the 82d parallel of north latitude. The idea of the existence of a hollow space within the earth was set at rest by the measurement of the average density of the planet, and the contrary view was advanced that the globe is a mass of great specific gravity. The constituency of this mass, whether it is fluid or solid, with only local bubble-like spaces, filled with fluid matter, has not been determined; but the calculations that have been made contradict the theory of a wholly fluid interior.

Several methods have been adopted for ascertaining the mean density of the earth, to the oldest of which a more accurate method has been added within a few years.—*Popular Science Monthly.*

A CURIOUS experiment has been made by Prof. Ira Remsen, of the John Hopkins University, Baltimore. It was instituted by him in order to see whether the lines of force in a magnetic field would have any influence on chemical action. For this purpose he placed a shallow pan of sheet iron, containing a solution of copper sulphate, over the poles of a powerful permanent magnet, capable of supporting 53 lbs. Outside the influence of the magnetic field pure copper was, of course, deposited uniformly on the iron; but when the saucer was set on the poles of the magnet, the deposit was reduced along the lines marking the poles, so that a groove or "ditch" was soon formed in the copper. When a still more powerful electro-magnet was employed, a still more striking effect was noticeable. The poles were marked by lines of no deposit, and in the space which they enclosed, that is to say, the space immediately over the poles, the copper was deposited uniformly, whereas beyond the blank outlines, the plating was heaped up in irregular ridges at right angles to the lines of force, and apparently coincident with the lines of equi-potential surfaces. By increasing the power of the electro-magnet, the action was intensified and the affected area widened. Prof. Remsen obtained circular ridges nearly four inches in diameter.

WHY SCIENCE IS OPPOSED.—Opposition to science is not the exclusive reproach of any one school of thought; it has been manifested by all. Theology withstood science, because it was itself identified with the old erroneous explanations of nature. Philosophy made a stand against science, because science circumscribed its field and subverted its ideals. Literature strove against science, because of its devotion to fact and its supposed unfriendliness to imagination. Art resisted science as unfavorable to the inventive and creative spirit. Science studied matter to understand its mysterious processes and discern its laws; the schools of culture all contemned the occupation of mind, and shrank from it as a descent into groveling materialism. Philosophy was most potent in its opposition, because it gave law to education and gave reasons to theology, literature and art.—*Prof. E. L. Youmens.*

ALUMINUM FOR TELEGRAPH WIRES.—German telegraphic engineers, it is said, have lately been making some promising experiments with aluminum as a material for telegraph wires. This metal can easily be drawn out to a much finer gauge than is possible with iron, and its conductibility is twice as great; but its greater cost has prevented its use for this purpose. It is now found, however, that an alloy of aluminum and iron can be readily made which will produce a wire much superior to iron as a conducting medium, while it is both finer and stronger, and also less susceptible to atmospheric changes.

COMPARATIVE VALUE OF STEAM ENGINES.—Hallauer's recent experiments have led him to the conclusion that the difference between engines of one and two cylinders, in point of economy, is very slight. In ranging from 80 to 8,000 horse power, with revolutions varying from 25 to 90 per minute, the expenditure of steam for a given amount of work remains the same for the same type of motor. The consumption for two cylinder motors are identical for Woolf and compound, whatever may be the volumes of the cylinders, provided the motors are regulated so as to give the maximum efficiency. The expenditures of steam in motors of one, two and three cylinders, suitably regulated and constructed, are so nearly alike that the choice may be governed in each instance merely by the fitness of the type of the engine for the particular purpose desired.

TO FIT A KEY.—Smoke the blank over a candle. Insert it into the keyhole and press it hard against the wards of the lock. The indentations in the smoked portions will show where to file.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Sept. 22		Week Ending Sept. 29		Week Ending Oct. 6.		Week Ending Oct. 15.	
Alpha	4¼	3.95	3.80	3.60	3¼	3	3¼	3¼
Alta	5½	5	5⅝	5½	5¼	4.35	4.90	4.55
Andes	2.30	1.70	2.40	1¼	2	1.60	1⅞	1.70
Albion	1.95	1⅛	1 95	1.80	2⅛	1.90	2⅛	2
Argenta	15c	....	20c	....	....	....	15c	10c
Addenda	20c	15c	15c	10c	15c	....	15c	10c
Belcher	3.35	3	3¼	2⅛	2⅛	1.85	2.05	1.90
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	15⅛	12⅞	14⅛	13⅞	14⅛	11⅜	13⅜	12⅛
Bullion	1⅛	60c	70c	65c	80c	50c	65c	55c
Bechtel	90c	75c	85c	75c	80c	70c	75c	70c
Bel Isle	....	....	10c	....	....	....	....	....
Bedie	8⅛	8	8	7	9	6⅝	8⅛	7⅞
Benton	1.15	1	1.10	1	1.05	75c	90c	80c
Bulwer	2½	....	2⅜	....	2⅜	1⅛	....	....
Boston	....	....	15c	....	5c	....	5c	....
Black Hawk	....	....	20c	15c	10c	....	5c	....
Belvidere	2½c	10c	....	....	10c	....	....	....
Booker	5c	....	....	....	....	....	....	....
Caledonia	40c	20c	25c	20c	20c	10c	10c	....
California	1	95c	1.20	95c	1.10	85c	1	90c
Challenge	90c	60c	80c	....	90c	65c	70c	....
Choller	3	2½	2.70	2½	2⅔	2.45	2⅝	2.30
Confidence	4	3⅝	3⅝	3.60	3	....	3⅜	3
Con Imperial	20c	10c	25c	10c	20c	15c	20c	15c
Con Virginia	2.20	1.90	3.40	2.20	2⅝	2.40	2.55	2.35
Crown Point	1.90	1.60	1.70	1⅛	1.40	1	1.85	1.70
Columbus	....	....	25c	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1	....	1	....	1.15	1	1	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2.80	2.05	2⅛	2.30	2.45	2⅛	2⅛	....
E. Mt. Diablo	35c	30c	40c	25c	35c	20c	20c	....
Eureka Cou	27½	27	27½	25⅛	25⅛	25	22	20c
Exchequer	1.30	1	1.10	1	1.10	65c	1⅛	90c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	40c	....	40c	....	35c	....	10c	10c
Golden Gate	....	....	2.30	....	....	....	2.60	....
Goodshaw	45c	....	40c	35c	40c	3?c	35c	....
Gould & Curry	8⅜	7	8⅜	7⅜	8⅛	6⅞	8⅛	7⅛
Halo & Norcross	4.60	3.80	4.40	3.90	3.70	3	3⅛	3.05
Head Center	....	....	1	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
ndependence	....	....	....	....	....	....	....	....
Julia	50c	30c	25c	....	20c	10c	15c	10c
Justice	1.10	30c	1	90c	95c	70c	75c	65c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	1⅞	1⅛	2.30	2.15	2⅛	....	2⅛	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	25c	15c	20c	....	20c	15c	20c	15c
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	1⅛	....	2⅛	2	2.10	1⅞	2⅛	1⅛
McClinton	10c	....	5c	....	....	....	10c	5c
Mono	3	2⅛	3	2	3.10	2	2.60	2⅛
Mexican	14	11	12⅞	11⅞	10⅛	8⅛	9⅜	8⅛
Mt. Diablo	6⅛	....	6⅛	....	6	5⅜	6	5⅛
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	20c	5c
Noonday	65c	50c	55c	50c	50c	25c	60c	50c
New York	15c	10c	15c	....	....	....	10c	5c
Northern Belle	14⅜	11⅛	13⅜	....	11⅞	12	11⅛	10⅞
North Noonday	....	....	....	....	30c	25c	40c	30c
Navajo	35c	25c	50c	....	....	....	60c	....
Occidental	1⅛	....	1⅛	1.45	1⅛	1.30	1⅛	1.40
Ophir	9⅛	7⅞	9⅛	8⅛	7⅞	6	7⅞	6⅛
Original Keystone	....	....	....	....	....	....	....	....
Overman	2.95	2.55	2.60	2.15	2⅛	1.20	1.65	1.45
Oro	65c	55c	70c	65c	75c	70c	70c	60c
Paris	....	....	....	....	....	....	....	....
Potosi	4.10	3.15	3¼	2.95	3⅛	3	3	2.80
Queen Bee	....	....	5c	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	3.60	2.50	3.20	2.85	3.30	2.60	4.05	3.40
Seg Belcher	9⅛	9	8	....	7⅞	....	7⅞	7⅛
Sierra Nevada	28⅛	18	24⅝	20⅛	19	12⅜	16⅛	14⅛
Silver Hill	40c	30c	30c	20c	30c	20c	30c	25c
Silver King	19⅛	15⅛	18⅛	15⅛	17⅛	17	18⅛	18⅛
Socoor	....	....	....	....	....	....	....	....
Summit	25c	....	25c	....	15c	....	....	....
Scorpion	2.60	1.90	2.40	2	2.10	1⅛	1.60	1.65
Solid Silver	35c	....	35c	....	45c	40c	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	45c	....	....	....	....	....	....	....
Tioga Con	50c	40c	40c	....	45c	35c	50c	35c
Tiptop	6	5⅜	6	5⅜	6	....	6	5⅜
Tuscarora	20c	....	20c	....	25c	....	20c	15c
Union Con	19⅛	13⅜	16	14⅛	14	12⅜	14⅛	13⅜
Utah	14⅛	11⅛	12⅛	11⅜	9⅛	7⅛	8⅜	7⅛
Ward	....	....	....	....	....	....	....	....
Wales	80c	....	....	....	....	....	75c	....
Yellow Jacket	6	4.80	5⅛	5	4⅜	4.10	4.30	4.15

Sales at S. F. Stock Exchange.

Thursday A.M., Oct. 13.

250 Alta.....4.55
110 Andes.....1.70@1⅞
60 B & Belcher.....1⅜
230 Belcher.....1.90@1.95
170 Benton.....80@85c
400 Bullion.....60c
45 California.....95c
895 Con Virginia.....2⅛@2.55
310 Chollar.....2.45@2.40
600 Crown Point.....1.80@1.85
50 Bon Imperial.....15c
300 Caledonia.....10c
585 Exchequer.....1⅛
65 Golden Gate.....2.60
135 Gould & Curry.....7⅛@7⅜
643 Hale & Nor.....3⅛@3.40
20 Justice.....65c
450 Julia.....15@10c
50 Kentuck.....2.30
60 Mexican.....9⅛
100 New York.....5c
150 Ophir.....7
100 Overman.....1.45
35 Occidental.....1.45
450 Potosi.....2.95@3
535 Sierra Nevada...15⅛@15⅛
2250 Savage.....3⅞@4.05
330 Scorpion.....1.65@1.70
50 Seg Belcher.....7⅛@7⅛
455 Union.....13⅞@13⅝
125 Yellow Jacket.....4.30

AFTERNOON SESSION.

160 Albion.....2⅛@2.20
70 Bodie.....3@3⅛
50 Bechtel.....70c
1500 Bodie Tunnel.....1.20@1⅛
300 Day.....21
40 Eureka Cou.....21
700 Holmes.....50c
20 Mt Diablo.....5
50 M White.....2
35 Mono.....2.00@2⅛
100 Noonday.....50c
30 N Noonday.....40c
40 Northern Belle.....11⅛
250 Oro.....60@65c
400 Syndicate.....40c
10 Silver King.....1.85
440 Tioga Con.....35@30c

Bullion Shipments.

We quote shipments since our last, aud shall he pleased to receive furtber reports:

Western, October 4th, $9,818.53; Horn Silver, 4th $12,500; Germania, 4th, $3,400; Hanauer, 4th, $2,075; Stormout, 4th, $3,290; Stormont for month of September, $31,963; Germania, 5th, $3,000; Stormont, 5th, $3,576; Horn Silver, 5th, $10,000; Barbee & Walker, 5th, $3,060; Alice, 5th, $15,000; Syndicate, 5th, $6,020.44; Germania, 5th, $2,150; Hanauer, 5th, $2,160; Northern Belle, 5th, $6,814.53; Germania, 6tb, $2,450; Great Basin, 6th $3,-550; Horn Silver, 6th, $5,000; Stormont, 7th, $3,798; Hanauer, 7th, $2,240; Germania, 7th, $2,550; Horn Silver, 8th, $5,000; Bodie Con., 10th, $5,970; Standard Con., 10th, $40,810.39; Northern Belle, 10tb, $7,535.20.

The cargo of petroleum of the Italian brigantine *Armenia*, bound for Marseilles, exploded, sinking the vessel and drowning eight persons.

The annual meeting of the National Association of wool manufacturers at Boston was attended by representative wool manufacturers of the United States.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argenta M Co	Nevada	9	10	Sept 5	Oct 7	Oct 28	F M Hall	327 Pine st
Belcher M Co	Nevada	23	1 00	Sept 29	Nov 1	Nov 24	J Crockett	327 Pine st
Bello Isle M Co	Nevada	3	10	Sept 13	Oct 18	Nov 8	E M Hall	327 Pine st
Boston Con	California	2	20	Sept 15	Oct 21	Nov 12	F D Luty	330 Pine st
Eullion M Co	Nevada	21	1 00	Sept 21	Oct 26	Nov 15	J M Brazell	328 Montgomery st
Belvidere M Co	California	12	25	Sept 22	Oct 29	Nov 21	C V Huhbard	310 Pine st
Champion G & S M Co	California	9	25	Sept 19	Oct 25	Nov 15	P Burns	309 Montgomery st
Chollar M Co	Nevada	8	50	Aug 29	Sept 30	Oct 21	W E Dean	309 Montgomery st
Con Imperial	Nevada	15	10	Aug 22	Sept 27	Oct 18	W E Dean	309 Montgomery st
Con Virginia M Co	Nevada	16	30	Aug 2	Sept 24	Oct 22	A W Havens	309 Montgomery st
Crown Point G & S M Co	Nevada	45	75	Sept 7	Oct 12	Nov 2	Jas S Newlands	327 Pine st
California M Co	Nevada	2	10	Oct 4	Nov 9	Nov 30	E F Stone	306 Pine st
Caledonia M Co	Nevada	37	25	Sept 29	Nov 2	Nov 22	R Wegener	———
East Mt. Diablo	California	2	10	Sept 27	Oct 31	Nov 21	G W Fisher	324 Pine st
Eintracht G M Co	California	8	05	Sept 27	Nov 2	Nov 19	H Kuntz	209 Sansome st
Exchequer M Co	Nevada	17	25	Sept 8	Oct 12	Oct 31	C E Elliott	327 Pine st
Graud Prize M Co	Nevada	7	25	Sept 30	Nov 1	Nov 21	E M Hall	327 Pine st
Hale & Norcross M Co	Nevada	71	50	Oct 6	Nov 9	Dec 1	J F Lightner	309 Montgomery st
Harrington M Co	California	2	05	Jun 15	Oct 14	Nov 5	O O Miller	409 California st
Independence M Co	Nevada	8	15	Aug 25	Sept 26	Oct 17	E M Hall	327 Pine st
Julia Con M Co	Nevada	16	30	Sept 16	Oct 21	Nov 11	H A Charles	419 California st
Justice M Co	Nevada	35	25	Sept 13	Oct 18	Nov 8	K F Kelly	419 California st
Kentuck M Co	Nevada	16	50	Aug 22	Sept 26	Oct 17	A O Stuart	234 Montgomery st
Lord of Lorn M Co	Nevada	2	10	Oct 8	Nov 17	Dec 19	R N Van Brunt	318 Pine st
Maybelle Con M Co	California	9	20	Sept 20	Nov 18	W J Taylor		310 Pine st
Mt Potosi M Co	Nevada	7	15	Aug 12	Sept 17	Oct 10	J H Sayre	330 Pine st
Murchie G & S M Co	Nevada	7	15	Sept 7	Oct 11	Nov 10	Wm Letts Oliver	326 Montgomery st
Mexican M Co	Nevada	17	1 00	Oct 4	Nov 8	Nov 28	C L McCoy	309 Montgomery st
Mackay & Revolution M Co	Utah	1	05	Aug 23	Sept 21	Oct 21	C C Harvey	309 California st
Mono M Co	California	14	1 00	Oct 4	Nov 9	Nov 29	W H Lent	309 Montgomery st
Ophir M Co	Nevada	40	1 00	Sept 30	Nov 3	Nov 23	C L McCoy	309 Montgomery st
Occidental Con Gravel M Co	California	8	06	Aug 22	Oct 3	Oct 26	W T Smith	414 California st
Potosi M Co	Nevada	6	50	Aug 29	Oct 4	Oct 25	W E Dean	309 Montgomery st
Quartz Mountain M Co	California	13	75	Oct 7	Nov 14	Dec 5	E Hestris	729 Montgomery st
Sierra Nev S M Co	Nevada	70	1 00	Oct 6	Nov 10	Nov 29	E L Parker	309 Montgomery st
Savage M Co	Nevada	47	50	Sept 5	Oct 7	Oct 27	E B Holmes	329 Montgomery st
Tioga Con M Co	California	14	20	Aug 16	Sept 22	Oct 12	W H Lent	309 Montgomery st
Wide Awake M Co	Arizona	14	10	Sept 16	Oct 21	Nov 12	C Hildebrandt	Bush & Kearny sts

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Alpha Hydraulic M Co	California	3	25	Aug 20	Sept 27	Oct 18	J Ireland	216 Sansome st
Bengal M Co	Arizona	1	02	Aug 31	Oct 7	Oct 29	J H Sayre	330 Pine st
Defiance G M Co	California	6	05	Aug 26	Sept 30	Oct 20	W H Lent	309 Montgomery st
New Basel Con Gravel M Co	California	—	10	Aug 25	Oct 1	Oct 20	F X Simon	525 Commercial st
North Sierra Nev Co	Nevada	3	10	Sept 19	Oct 27	Nov 17	C C Harvey	309 California st
Peabody G M Co	California	1	04	Aug 31	Oct 3	Oct 21	R D Hopkins	317 Montgomery st
Santa Anita M Co	California	1	13	Aug 20	Sept 25	Oct 10	J B Titus	34 Kearny st
South Hite M Co	California	2	10	Sept 1	Oct 5	Oct 29	T A Berlin	515 California st
Spaulding G & S M Co	California	2	10	June 28	Sept 23	Oct 21	J W Pew	310 Pine st
University G M Co	California	9	10	Aug 15	Sept 20	Oct 12	Wm. L Oliver	328 Montgomery st
Western Home Con M Co	Idaho	2	05	Aug 16	Sept 26	Oct 26	A Halsey	328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Belvidere M Co	California	C Van Dyck Hubbard	310 Pine st	Annual	Oct 18
Happy Valley G M Co	California	D M Kent	330 Pine st	Annual	Oct 21
Hila M & M Co	———	B F Dahl	331 Montgomery st	Annual	Oct 25
Shawmut G Q M Co	———	J S Bacon	316 California st	Annual	Oct 27
Syndicate M Co	Nevada	J Stadfeld	419 California st	Annual	Oct 29

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Sept 27
Father De Smet M Co	Dakota	H Dean	New York	50	Sept 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Oct 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Oct 15
Silver King M Co	Arizona	J Nash	315 California st	25	Oct 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Oct 12
Tip Top M Co	Arizona	H Deas	309 Montgomery st	20	Aug 25
Western M Co	California	C S Curtiss	309 Montgomery st	76	Sept 10

Mining Share Market.

Happily we are not this week without a sensation in the mining share market. This grows ont of a remark said to have been made by Col. Fair, to the effect that he entertains a hope, or at least a partial hope, that there exists and most likely always will exist a strong probability that ore, water, porphyry or somethiug else, will yet be strnck in the lower levels of the Comstock; and if not in the lower levels of the Comstock then in some other locality equally deep, dark and hot, but not so *damp* as the great sub-aqueous Washoe ore channel, with the exact sight of which locality he, the Colonel, is not at this time so well posted as he hereafter expects to be.

The annouucement of such a positive and unqualified opinion hy a man so cautious aou gnarded of speech as Col. Fair, prodnced uot only a profound sensation among mining men in this city, hnt created such a cheerful feeling over on the Comstock, that maoy of the old residenters were seen to *smile*, a few having gone so far in their glee as to get drnnk ontright. The nltimate effects of this new revelation remains to be seen.

Meantime, stocks wobblo after the fasbion most in vogue since the Sierra Nevada sqnash-out, a condition they are likely to maintain, at least for the present, and probably for a long time to come.

Tamalpais Hotel.—This most delightful and healthy resort has this summer been refurnished and painted throughont. The proprietor, Mr. W. G. Graham, formerly of Congress springs and other leading conntry hotels, is well known throughont the Pacific coast for his courtesy and attention to his guests. As a caterer he is nnrivaled. The beanty of the country aronnd San Rafael, and the mild and salubrious climate render it a most desirable residence dnring the fall and winter months.

Messrs. Parke & Lacy, tbe well-known dealers in mining machinery in this city, bave gradually enlarged and increased tbeir business, until now they inclnde other branches outside of machinery for use in mines. They bave a very full line of pumps for all sorts of purposes, to be run either by hand or steam. Have woodworking machinery, machinists' tools, steam engines, mill and mine supplies, steel and iron, flat and round wire rope, barbed wire for fences, etc. They will in tbe futnre make a specialty of wood-working machinery. Their stock of wire rope is very large and varied.

Cablegram advice is to hand, giving price of quicksilver in London at £7. Here the stock is very small, and price has advanced to 42 cents a pound.

End of a Noted Prospector and Explorer.

The Spokane Falls *Chronicle* of recent date contains a notice of the death of Joel S. Mead, who was killed by an explosion of powder at Joseph's prairie, in the Kootenay conntry, British Columbia. The *Chronicle*, in alluding to tho sad casualty, remarks that the deceased enjoyed the respect and esteem of all who knew him. This was undouhtedly the case, for Joel S. Mead was a man notable for his generosity, courage and other manly characteristics.

He arrived at San Francisco from New York, his native State, early in the summer of 1849, being then a mere boy, and had remained on this coast ever since. He was as fine a type of tbe California prospector and explorer as the conntry has ever produced, having a fondness for hardy adventure and new scenes that kept him constantly on the mining border. Possessed of a powerful frame and good general habits, neither deprivation, exposure nor toil deterred bim from undertaking the most difficult and dangerous frontier journeyings, he having been among the mining pioneers not only of California, bnt also of British Columbia, Idabo and Montana.

He was among those who visited Arizona and northern Mexico, traversing large sections of both, at a time when the bostility of tbe Apaches made it exceedingly perilous for small prospecting companies to enter that conntry. Mead and his party were on one occasion attacked by these Indians and several of bis companions killed, among them a yonng man to whom he was greatly attached. In pursuing the murderers the next day Mead advancing ahead of his party came suddenly np with the retreating savages, on whom be fired, killing two of them. Having exhausted his shots, he rushed ahead, and, grappling with a third, a powerful fellow, dispatched him with his knife.

Though a man of such cool and determined courage, the subject of these remarks was noted for his kind and peaceful disposition aod qniet demeanor. We have all too few men possessing the kindly virtues and noble attributes of Joel S. Mead.

The Paper Makers of the Eastern States have driven their works so steadily during the past year, that they have largely overstocked the market with every description of paper. So large bas this surplus become, that mntual arrangements are reported to have been recently made among the principal holders to make up a large amount for export to Europe, in order to relieve the home market of its burden. This fact may also be taken as very good evidence of the profitable natnre of the business and the little need that exists for the present rate of duties upon imported paper, which is in fact an indirect tax npon the consumers.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

At the Volunteer Mine.—*Ledger*, Oct. 8: Work has been suspended, the pipe for conveying water to the mine not being strong enough to sustain the pressure, and will bave to be replaced by stronger.

Jackman.—A lot of ore from this mine yielded but $5 per ton exclusive of sulphurets. But as the latter are rich, even this low grade ore can, it is thought, be worked with profit.

The Kennedy mill is still running, and the rock that is being crushed, pay.

Other Mines.—The new patent whim for the Median mine arrived safely, and has been running for several days. They have a ledge six ft wide, of ftne looking ore. The Talisman mill is being put in working order, and is expected to commence crushing to-day. At the Bunker Hill mill 20 stamps have been hung up temporarily, and the working force reduced. At the Amador Consolidated, with the exception of sioking the sump, everything is ready for tunnoling. The depth of 1,000 ft is accomplished, and as soon as the station is completed, drifting will be prosecuted vigorously. The laying of pipe for the Amador canal extension to Plymouth is in full blast. If no further drawbacks occur, the job will be completed by the time winter sets in. The Iowa, a 5-stamp mill, started up on Tuesday last, and in course of time will probably develop a paying mine. The Golden Eagle mine has closed down for this season. The owners sunk a shaft this summer 100 ft deep and found enough to warrant them putting machinery on next spring. The Amador Reduction Works is running on sulphurets from the Keystone mine and Stewart's chlorino works on sulphurets from the Mahoney.

CALAVERAS.

Ditch and Quartz Mill.—*Mountain Echo*, Oct. 4: The Lewis Co ,l near Robinson's ferry, is digging a ditch 10 ft wide and 8 ft deep, for furnishing water for the new quartz mill which they propose building in a short time, and which is to have 80 stamps.

Iron Mine.—James Sperry of the Big Trees has recently discovered and located an iron mine, about 1 mile north of Murphy's, in Calaveras county, which bids fair to rival the famous Iron Mountains of Missouri. The mill upon which the mine is located has been thoroughly prospected for nearly a mile and three-quarters, showing the same character of ore for the entire distance. It is not confined to a vein or lode, but is simply a mountain of ore of a very excellent quality known as brown hematite. Several assays have been made from the mine, some of which assayed as high as 60%.

Small Nugget.—A fine gold nugget worth $15 was picked up on Angels creek a few days since by a Mexican.

INYO.

Offer to Buy.—*Independent*, Oct. 1: Wm Hamilton —probably in the interest of Osbiston & Smith—has offered the Mexican owners of the Keynot mine, Beveridge district, $45,000 for it, which has been refnsed. A McKellips on the 30th ult., brought into Independence 7 ounces of gold, the proceeds of a 7 day's run of a little arastra near the old Chrysopolis mill. The gold is very fine, being worth $19 per ounce. Supt. Holt is overhauling the Rex Montis mill.

New Mill.—*Independent*, A new mill is about to be put up on the mines in Craig's canyon, Beveridge district. The ore is just as rich in free gold as any, while so far as opened the mines look equally as well. This matter of home enterprise and co-operation hits the nail square on the head, and the local community that supports legitimate operations of the kind is bound to win in the race for wealth and population, as against a place where business men lack enterprise or refuse help or credit.

Ore Ahead.—On account of a breakage down in the Taylor & McEvoy mill, the Keyoot mine managers have been compelled to discharge a lot of miners for lack of dump room. Some 250 tons of ore lie on the dumps at the mine and mill, of an even grade of from $100 to $118 per ton.

Where the Money Went.—A few instances can be called to mind which go to show where a good deal of wild "outside capital" was absorbed in this country in early days, when freights were enormous, Indians obstreperous and quartz mining in its infancy. On the other side of the river thousands of dollars lie in the sand, run off in tailings and amalgam. An illustration lately occurred at the old Chrysopolis mill, where the slum tanks are covered with 4 ft of accumulated debris. Out of the black earth near the mill a hoxful was taken in which to raise flowers. Seed were duly planted, but they failed to come up. Dumping out the earth, nearly an ounce of gold amalgam was discovered scattered through it. In the sand-covered tailings also of the San Carlos, Ida and Union mills there are small mines of amalgam and naturally oxidized sulphurets. Doubtless the old Union, Eclipse and present Brown Monster mills have equally valuable deposits, waiting a clean-up of former loss and waste. One would now-a-days like to have a small percentage of the precious metals lost at the old Olancha mill at the foot of the lake, and the Josephine, at Old Coso. The loss, through incomplete amalgamation at the Pioneer, Kearsarge and Greaser (afterwards the Silver Sprout, now the Rex Montis) mill in Kearsarge district, lies irrecoverable in the floods of the creek, as does most of the rich tailings from the old arastras at Fish Springs. The enormous slag piles at Cerro Gordo contain $9 per ton silver, as ascertained by recent assays. But the most notable instance is that of the Owens Lake Silver-Lead Co.'s furnace at Swansea, which operated from 1870 until 1874. There is left there a slag pile of 8,000 tons. After breaking it up and separating the particles of clear lead, the black slag assays $16 per ton.

MARIPOSA.

Hite Mine.—*Gazette*, Oct. 8. Is raising richer ore than ever from the new shaft sunk from the lower level. The body of ore is large and steadily increasing in width and richness. Whenever the river level is reached in this mine, look out for a bonanza of no ordinary magoitude.

South Hite.—The ore now being taken out here is of fair quality, and the prospect of reaching a permanent body of good ore soon is favorable. Modesto silver mine shaft which is down about 230 ft, shows a well defined vein about 2 ft wide, of ore said to be worth from $100 to $500 a ton. Other claims are being prospected in the same neighborhood.

The Diltz.—The shaft on the north side of the mine is downabout 75 ft, and a level is being run northerly on the vein from the bottom, which has reached 30 ft. The ore prospects well, and a fine lot for milling is being brought to the surface. The mines of the Cook Bros., near Coultonville are being worked successfully. The tunnel connecting the Potosi with the Mary Harrison, is about completed, and rich ore is being taken out. The prospects are that quartz crushing will soon be commenced here again. The Savage mine is developing rich ore. Some 3 or 4 weeks ago a pocket of about $500 was taken out, since which time the miners have about $3,000 in sight. Martin & Walling, and Bower Cave mines are being prosecuted with favorable results.

Banderita.—The 1,500-foot tunnel is about one-half finished, and when completed and connected by shaft with the upper works and levels, will probably develop a larger and richer body of ore than ever before.

No 9 mine with a steam mill and 30 stamps, is running with great success under its new management. The Washington mine with new compressor and drill, is making headway through an 8-foot vein of excellent milling ore, taken out below the 1,400 level.

NEVADA.

WILSON RANCH MINE.—Nevada *Transcript*, Oct. 8: We are informed by Prof. Frost, that in all probability the erection of the extensive mining works to be put up on the Wilson ranch property will be begun soon. The buildings and machinery will be of the most substantial character, and the property will be developed as rapidly as possible. The enterprise is being carried on very quietly, and in striking contrast with some of the much-puffed ones of adjacent districts.

THE CHAMPION BONANZA.—A shot in the Champion mine Wednesday night brought the whole breast of the drift into a body of rich ore, the extent of which cannot be estimated. This development indicates very strongly that the ledge which was discovered Friday night is not a blind one, but the main deposit for which the company have been striving.

FINDING THE BIG TUNNEL.—Next Monday the South Yuba Co. will begin retimbering the Big Tunnel, 18 miles above this city. The work will take some time, and in the meantime the water will be shut off from that ditch.

NEW HOISTING WORKS.—*Transcript*, Oct. 11: The carpenters have commenced the erection of the new hoisting works for the Meade M. Co on the Pennsylvania mine, and will push the work with all possible dispatch.

NEVADA CITY MINE.—Last month the new 10-inch pump of the Nevada City was lost and the mine flooded. Since then pumping and baling has been going on day and night, and yesterday the water had been lowered to the 350 level, and the disabled pump repaired. The remaining 80 ft of the incline will soon be dried. The mill will start again to-morrow.

THE BLUE TENT MINE.—The bedrock tunnel is completed and the upraise was commenced yesterday. It will take about 10 days to finish this work, and then the flumes will be put in readiness to start washing when the rains come.

A BIG pump weighing 2 tons exclusive of the fixtures, has been received for the Derbee mine. The present ones are not powerful enough to control the water.

PLACER.

CUROME.—*Herald*, Oct. 8: Some 4 or 5 years ago chrome iron was discovered near the Sugar Pine mills, on the Iowa Hill divide. The first attempt to commercially utilize it, according to the SCIENTIFIC PRESS, has been made this year, 100 tons having been shipped to San Francisco. The ore, which is of excellent quality, is found in irregular, disconnected masses imbedded in the country rock, and varying in weight from a few pounds to several hundred tons. On the largest mass yet found a shaft 20 ft deep has been sunk and does not pass through the deposit. It is expected that the prospecting now going on will develop a large and continuous ore body.

PLUMAS.

GREEN MOUNTAIN.—*National*, Oct. 8: While this company have milled a large quantity of ore, they have developed fully as large a quantity, and probably of better quality, in the Sulphuret ledge. There is lots of good pay yet in the White ledge—the one now being worked—as the mill returns show. The Green Mountain is a first-class "stand-by," a stayer in every sense of the word.

RICH GRAVEL.—The drifts lately run on the Newtown Flat claims have developed some very rich pay, and proved that the lead or pay-streak is some 40 ft in width. With 3 or 4 men at work last week, the clean-up amounted to $300, and the week before to about $100, some of the pieces weighing between $20 and $30. The gold is heavy, washed, rusty and black. The work at present is at a decided disadvantage, and when the claim is placed in proper shape, as it soon will be, there is no doubt but that some wonderful results will be shown.

THE CORBIN & MANSON.—The new shaft struck bedrock on Monday last, and the prospects are very favorable The depth is 80 ft. No washing has been done up to this writing, but small pieces of gold were picked up by the workmen, and the gravel and bedrock look first-class. The upper ground is also paying well, and everything looks right. Developments in the new shaft will soon be made, and we think some splendid pay will show up.

CHEROKEE.—Greenville *Bulletin*, Oct. 5: At the bottom of the new shaft of the Cherokee mine, and the depth of 240 ft, indications of quartz were found several days ago. A new level, No. 3, was started and a fine vein of ore found; the lode is from 5 to 6 ft thick, and of excellent quality. Enough is being taken out now to keep the mill running steadily, and the ledge continues to open out well. This mine has now been developed enough to prove that it is of great value. Within a distance of 240 ft, four separate ledges have been found, known respectively as the White, Josephine, Kettle and Old Bach ledges. The first is irregular in thickness, varying from 6 to 12 ft; the second is about 2½ ft thick; the third, 5 ft, and the fourth about the same. Enough of these have now been opened to furnish work for the mill for a long time to come.

THE Rock Island Hill mine, owned by Mr. W. Smith Dean, has developed well of late; the gravel, in the deepest part, is about 18 ft, and gold is found all the way from top to bottom. It is not intended to drift more than about 6 ft of it, however; this is all quartz gravel, free from bowlders. It gives 5 cents to the pan on every trial; one man can get out 10 carloads a day, and the gravel will give $5 to the car.

SIERRA.

BALD MOUNTAIN EXTENSION.—*Messenger*, Oct. 8: The clean-up here for one and a half days this week, was 27 ounces of heavy lead gold; in it a curiously shaped nugget of 8 ounces. But 4 men are able to work underground, owing to the impure air, that will soon be remedied on arrival of new iron air pipe, when a large force of miners will be afforded constant and lucrative employment. Last week 27½ ounces were sluiced from the upper or prospecting dump.

NOTES.—The Chinamen at work in the river beds hereabouts, still hold their position despite the recent high water, and are busy at work. J. W. Brown is busy making large sized iron water pipe for the Good Hope quartz mine. The Bonanza gravel claim, Howland Flat, continues on a dividend basis.

SHASTA.

SMELTING ORES.—*Courier*, Oct. 8: Assays of quartz taken from the Knox mine on Spring creek, are pronounced sufficiently satisfactory to justify the erection of smelting works. There are a number of rich ledges on Spring creek that would pay well if worked by improved machinery. The quartz is plentiful and rich in gold and silver, but base metals interfere with the amalgamating process

SISKIYOU.

Yreka *Journal*, Oct. 8: The Lime gulch claim on the Klamath is beginning to show up splendidly, and promises to be one of the best paying claims on the river. It is one of the largest bars, and the pay gravel is believed to be 20 ft deep, affording plenty of rich mining ground for many years to come. A short time ago the miners came upon a high wall of black porphyry, beyond which good pay was found, realizing upwards of $40 to the bucket.

NEVADA.

WASHOE DISTRICT.

YELLOW JACKET.—The north lateral drift on the 3000 level was advanced 41 ft. Present length of same, 329 ft from the switch. North lateral drift on the 2328 level has been run 21 ft, making the present length of same 129 ft from the north winze. The ground is quite hard again, with less water. The north winze is this day 242 ft deep on the slope, having sunk the same 27 ft since last report. Ground quite hard. Sixteen ft more on the slope will reach the 3000 level.

CHOLLAR.—No underground work has been done for this company since last report.

CON. VIRGINIA.—Opening up winzes and connecting drifts with Con. Virginia old shaft to improve ventilation on the lower levels.

UNION SHAFT.—Repairing 1600 drift to Sutro tunnel connection, and completed laying extra line of pipes in same. Also cutting out bob pit at 2600 station.

CALIFORNIA.—Are opening up winzes, and connecting drifts with the Con. Virginia old shaft to improve ventilation on the lower levels. The 2700 level joint Ophir cast drift advanced 24 ft.

ALTA.—During the past week the east drift has been extended 44 ft; total distance from the shaft, 115 ft. The rock is hard, and the heat so oppressive that it will be necessary to put in another Baker blower for ventilation.

POTOSI.—The east crosscut on 2400 level is in a distance of 31 ft, and shows no water. The material passed through during the past week was hard porphyry. The underground work for this company is done by the C. N. S. men, for which we settle each month

SIERRA NEVADA.—The 2500 level east crosscut No. 2 extended 16 ft; east crosscut No. 4, 33 ft; main north lateral drift, 30 ft; west drill hole, 192 ft. The 2700 level joint Union Con. east drift extended 15 ft; Joint Union Con. west drift, 20 ft. Joint Union Con. east winze cleaning out bottom.

SAVAGE.—The Savage folks are extracting ore from the 1640 level, and from the old Potosi tunnel level, the bulkheads in the Chollar-Norcross-Savage shaft having been removed.

OPHIR.—The Ophir Co. have so far extended the old upper tunnel that it is now about under the Ben. Rowe vein. They are also sinking on the vein from the surface.

ITEMS.—There is about 400 ft yet to run to connect the west drift from the Joint Union Con. and Sierra Nevada winze on the 2700 level with the east drift from the Union shaft. Work is vigorously prosecuted from both ends and a progress of 40 ft per week is made. The east drift is intensely hot, which makes work necessarily slow. The Joint Ophir and Mexican east cross-cut on the 2900 level is being advanced in a favorable formation, although no assays are being obtained, as currently reported. The middle mined in assuming an increasing shape, and have now the invaluable aid of the finest system of pumping machinery ever constructed. In the Overman, Belcher and Crown Point they will very soon be ready for cross-cutting and other prospecting operations, while at the Alta they are going for their vein on the 2150 level as fast as powder and muscle can send a drift. It will take at least 6 weeks to complete the repairs in progress at the Hale and Norcross. Intense heat retards operations in the north end mines as well as in the middle or water mines. The Gold Hill group of mines are much cooler. At the Gobiston shaft the bob and tank pits are completed, and a double line of pumps will be put in to the 2100 level this week. In the Alpha and Imperial both are at work on the 2800 level. There is talk of resuming work in the Quinn mine.

BERNICE DISTRICT.

A NEW DISTRICT.—A mining district, called the Bernice, has been created in Churchill county, some 60 miles northwest of Austin. The principal ledge is said to be 8 ft in width, carrying free milling ore, from which assays have been made running from $50 to $250 to the ton. Several parties from Austin have visited the district, and speak enthusiastically of the prospect, says the *Reveille*.

CRABB DISTRICT.

MACHINERY.—*Herald*, Oct. 8: Machinery has been purchased for putting up a mill here. In a trial of the ore, 3,000 lbs yielded 10 lbs of amalgam.

ESMERALDA DISTRICT.

AT CORY CITY.—*Herald*, Oct. 8: There are about 35 men working at this place. The city boasts of a store, blacksmith shop, lodging-house, boarding-house and a saloon. The Hicks 8-stamp mill is getting away with 6 to 10 tons of Bay Injun ore daily. The ore has to be hauled about three-quarters of a mile. Toby Crossman and E. L. Buckingham are down on their claim about 100 ft, and have a fine prospect. Messrs. Young, Smith & Co. have a tunnel run about 60 ft on their property, and have struck a ledge of good paying ore. There are many other claims being worked, and the prospect for a live camp is good.

THE JENKS & GROSS MINE.—Tunnel in 180 ft, and a shaft sunk 30 ft on the ledge. Ledge is now some 5 ft wider than the shaft. Crosscutting will be commenced in a few days to ascertain the exact width of the ledge. Three assays went $130, $100 and $140, principally gold; 20% silver.

MORTITE.—Three shifts at work on the tunnel here, which will cut the ledge in 20 days; also making a good showing in the uppermost workings of the mine, running drifts and upraises, finding magnificent ore.

EUREKA DISTRICT.

THE WILLIAMS MINE.—*Leader*, Oct. 7: Connection is being made between the 300 and 360 levels of the Williams, in order to have better ventilation. The mine looks well, and new ore bodies have recently been uncovered. Parties in London have made inquiries lately concerning the Williams, with a view of purchasing it, but the owners, Messrs. McNaughton & Taylor, manifest no disposition to sell.

EUREKA TUNNEL.—*Sentinel*, Oct. 8: Good progress is being made on the ore body recently found in this property, though its full extent is as yet a matter of conjecture. So far the improvement is very encouragiug. The work of development, however, is progressing slowly, and it will be some time yet before the new find is fully explored.

GRANTSVILLE DISTRICT.

REPORT ON THE ALEXANDER.—*Bonanza*, Oct. 8: Supt. San Pedro reports mine looking as well as usual. Chloride stope between No. 4 and 5 levels is furnishing about one-half the amount of ore requisite for the mill. Stopes on No. 6 continue to yield usual quantity of ore. Are running a drift on this level northward along the supposed foot wall, and under the No. 5 ore body, which is showing splendid ore as far as run.

THE BROOKLYN.—No. 3 level going southwest was advanced 23 ft since last report, making the total length to date 105 ft; will have some 20 ft further to run this drift before cutting the No. 2 ore body. The ore stope on level No. 2 keeps improving in size all the time, and will produce a large amount of high-grade ore.

PIOCHE DISTRICT.

A LONG UPRAISE.—Ward *Reflex*, Oct. 3: The upraise started in March past to connect the old upper works of the Martin White has been completed. It is 700 ft long and settles the question of ventilation, enabling further developments to go on with comfort. The air comes from the mouth of the main tunnel, a distance of about 4,000 ft, with a rush and a roar. A chute is to be put up in the upraise, and all the ores and waste will be put through it to the main tunnel. In addition to developing the ore-body where the raise comes out, it is also the intention to do some prospecting along the line of the raise where several bodies of ore have been passed through.

ARIZONA.

COPPER MINES.—Tombstone *Epitaph*, Oct. 6: Three mines, which are situated in Cochise county, about 50 miles by wagon road, east from Tombstone, are yielding immense quantities of rich ore. The principal mine in the group, the Copper Queen, turns out 25,000 lbs of copper ore per day, on an average, some days running as high as 20,000 lbs, and others falling below the first figure, but making an average of 25,000 lbs or 375 tons per month. September was the first month that both smelters have run, and then not up to their full capacity, owing to various causes, and yet 1,806 tons of ore was smelted, producing 320 tons of copper. The entire product of the mine is shipped to the Ansonia Brass and Copper Works, at Ansonia, Con. As the metal is produced here at a cost of about 8¾ cents per pound, the profits realized are large. Since its incorporation, in New York, the company has paid monthly dividends of 1% on the par value of the stock of $2,500,000, thus making $25,000 per month. From this time on the dividends will be doubled, and there will be $50,000, or 2%. The 80,000 tons of ore now in sight is equivalent to 17,500 tons of copper, which should, at present prices, net the company $2,975,000. There are two 20-ton smelters at work day and night turning the crude ore into bars of what is technically known as black copper, which is 97 to 98 fine, averaging 97¼ fine.

THE Neptune company also own a valuable group of mines, and have about 300 tons of ore on their various dumps. Their smelter is located upon the San Pedro at Hereford, and will be ready to start up in the course of a week or 10 days. There are a large number of other locations within the district, many of which show good prospects.

BRITISH COLUMBIA.

KOOTENAY DISTRICT.—Spokane Falls *Chronicle*, Oct. 5: The construction of the Northern Pacific and Canada Pacific railroads, the one running a short distance to the north and the other to the south of this district, is likely soon to impart to prospecting and mining operations there a great impetus. As is well known, the country abounds in rich placer mines from which only the cream was taken by the first crop of miners, who, entering it along from '59 to '61, remained only long enough to wash the surface gravel; which done, they departed, leaving the country nearly deserted for the next 20 years. Knowing well that they had not exhausted the placers or even reached the richest portions of them, a number of the early adventurers into that region have returned during the past few years and taken up what they considered some of the most promising grounds and are now opening up and preparing to work the same. As the deposits they are now going after in most instances lie deep, it will require some capital and labor to reach and remove them. Hence, while the prospects are exceedingly encouraging, actual production must necessarily be postponed for a little time, deep shafts, and in some cases tunnels being required to open up the claims. Among the best managed and most promising of the new enterprises is that of the Kootenay Mining Co., organized to work the bed of Perry creek, known to be extremely rich in gold. The company, while incorporated under the laws of Washington Territory, have procured from the Legislature of British Columbia a long lease of the ground, which they are now opening in a thorough and systematic manner, the work being prosecuted with such energy that it will probably be completed before spring. When finished the gold that will be taken out here will astonish every one but these old timers themselves, who expect, and, in fact, may be said to know, that they will each and everyone realize from the first season's work a very handsome fortune, such result being made certain by the big prospects obtained from the several shafts sunk to bedrock. This company, being made up in part of practical miners working harmoniously together and financially strong, are in the best possible condition to make a success of the undertaking, and such is the confidence felt in the outcome of the enterprise that the company's shares are sought after here among all classes of our business and moneyed men, who would readily buy them at a considerable advance on their par value, were there any for sale. We hear of other mining schemes likely to be set on foot in that quarter, if some of them have not been already inaugurated. Prospecting for both placers and quartz will, no doubt, be very active throughout that entire region the coming spring, some gold bearing ledges having been found and located already.

COLORADO.

HAVERLY GOLDEN GROUP.—Denver *Tribune*, Oct. 5: The mines and the stamp mill of this company are on Bear creek, an affluent of the river San Miguel, which discharges its waters from a precipitous gulch, which cuts through many gold-bearing veins of the specially famous San Miguel gold region. Mr. Haverly and his associates invested in these properties over 2 years ago, and since have done development work sufficient to warrant the erection of a stamp mill, which, after making a test run on ore now on the dumps, will shut down for the winter. It is intended to add 10 more stamps, to be in readiness for next season's operations.

NORTH PARK.—The Rocky Mountain Co. own here several valuable mines, on some of which the work of development has already been commenced, and will be pushed with all the vigor and enterprise characteristic of the gentlemen at the head of this organization.

VARIOUS MINES.—Thursday of last week the Ute turned out 30 tons of milling ore, and on Friday sent to the surface full 50 tons. The San Juan Chief, near Mineral Point, is developed by a 20-ft shaft, and shows 2 ft of gray copper. The Silverton *Herald* says: "As the present writing we know of at least two smelters that will be erected in Silverton next year, which will give employment to a large number of laborers, and also a sale for the thousands of tons of ore now on the dumps of our mines. Indeed, from the present outlook Silverton will be the boss mining camp in the State before two more years roll around." Miners and mine owners of Silverton are laying in large supplies for the winter, which is a good indication that the mines of that district are going to be worked extensively between now and spring.

IDAHO.

SMELTER NEAR HAILEY.—Wood River *Miner*, Oct. 4: The smelter at Marshall gives employment to 15 men, ore and charcoal being plentiful. The dust arrester works nicely, making a saving of from 2½% to 3% net. The company is smelting ores from the following mines: Minnie Moore, Bellevue; Washington, Deer creek; Star, Hailey; Elk Horn, Warm Spring district. These ores average about 100 ozs to the ton, the smelter turning out 10 tons every 24 hours. During this last run of 15 days the company has shipped over 100,000 lbs of bullion.

KETCHUM.—The new smelter near this town is about ready to start up, and when in operation will make a great difference to the adjacent country

CRUSHING.—The Rising Sun mill, on Shaw's mountain, 12 miles from Boise city, has just finished a crushing of 134 tons of silver rock with good results.

DAKOTA.

VALUABLE PROPERTY CHANGES HANDS.—Black Hills *Times*, Oct. 6: The Fort Meade silver mining company today purchased the Red Cloud mine at Galena, in Bear Butte district. This is undoubtedly one of the most valuable mines in the Hills, and the Fort Meade company is displaying rare energy in that they have not only purchased the mine, but have shipped all necessary supplies and secured the services of the former owner of the Sitting Bull lode, who will immediately commence work and ore shipments to Omaha. Omaha will soon appreciate the Bear Butto district.

THE GUSTIN.—Black Hills *Times*, Oct. 5: This mine is being continually and profitably operated. The 25-stamp mill is running all the time, and the 20-stamp mill that is now undergoing repairs will soon start up again. In the spring this company will have a new 60-stamp mill in operation, and it will then be one of the foremost bullion-producing mines in the Hills.

THE PENOBSCOT CO.—Has a full force of men at work in its mine, day and night shifts, developing and opening up, and besides keeps the mill running all the time.

NEW MINING CENTER.—There is reported quite a mining excitement on Clark's fork, Yellowstone valley. Big assays of both gold and silver ores attest that there is some foundation for the rumor, but as the find is on the Crow reservation, no active work can for the present be done; but as the miners are near the route of the Northern Pacific railroad, an effort will at once be made to induce Congress to treat with the Indians for the title to this land. This is little doubt but this effort will prove successful, as it will receive the support of not only a numerous mining community, but also of the railroad company, who have a large interest in having the country opened up to the miners. The mineral resources of Montana are next in importance to the agricultural interests of Minnesota and Dakota, and the Northern Pacific will do all it can for their development. There will be but little trouble to secure the cession of these rich mineral lands from the Crows, unless officious intermeddlers shall make trouble by misrepresentation, for the mineral belt is absolutely of no value to the Indians for any purpose, as there is neither grazing or hunting on their sterile sides and snow-capped peaks. The mineral is found from 7,000 to 10,000 ft above sea level, and is largely in tellurium formation.

THE Western M. Co. own a group of mines, some of which have been worked and yielded fine ores, but operations were suspended on them after they were found to be on the reservation. Besides very satisfactory assays much ore from this region has been submitted to working tests with equally good results.

BLACK WARRIOR.—Twenty tons of ore from this mine has just been shipped to Salt Lake for reduction. This vein is 6 ft thick, and the lowest assay yet made of the ore yielded $600 per ton, and they think this mill will return from $1,000 to $2,000 per ton when they have worked it on the vein, the assays having all been made from surface ore.

WAR EAGLE.—The War Eagle, owned by Ponsford & Patton, is of the same character of quartz as the Black Warrior. The miners have developed the vein in every direction, and the promise of the outcropping is well sustained throughout.

THE Silver Zono yields free gold, and has yielded as high as 500 ounces of silver to the ton. The finding of a piece of free gold led to the location of this mine.

THE so-called Bowlder mines are placer mines, and were in the hight of their development when the Nez Perces, under the fierce chief, Joseph, went through the camp in 1870, and cleaned out the outfit. Hardly had the remnant of the camp returned when the Arrapahoes descended upon and killed 20 of them, and since then the miners have simply sought to hold their claims until they could be protected in operating them, after their titles shall have been clearly established. Some of these were discovered and operated after a crude fashion as much as 18 years ago. They promise to pan out well under favorable development. The advent of the railroad and Eastern capital will tend to put a new face on affairs and bring them out right very speedily.

THE Bear and Crevice, also placer, are located on the Yellowstone at the mouth of Gardiner river. This is a free gold lode, discovered in 1804, and at one time worked by a camp of 13 men, all of whom were set afoot by a raiding band of Indians, who stampeded their horses where they thought they had them securely cached at the head of the creek. The Legal Tender is owned by Stoner, McLaughlin & Co.

GUNDORF.—The Gundorf is owned by the Gundorfs, Hartman, Cannus & Fisher, and has yielded $3,500 per ton, which is fine pay dirt. The dust is cashed at Bozeman by the hank, and miners regard this class of mineral with great favor because it can be so easily converted into cash. These mines will be worked for all they are worth when titles have been perfected and the Northern Pacific shall have been constructed along the upper Yellowstone within easy access of them. Others will be discovered and developed, for these mountains are full of pay dirt and rich mineral.

MONTANA.

THE MOULTON MILL AND MINE.—*Inter-Mountain*, Oct. 4: The mill of this company is finished, and over 1,000 tons of ore on the dump and in the ore-houses. The only delay in starting the mill is the failure of the contractors having the contract to bring in the water by the 4 mile covered flume. The same is now completed to within 3,000 ft of the mill, and will be in within the next 10 or 15 days. As soon as the connections can be made, the mill will be ready to start crushing. The sudden rise in price and the scarcity of lumber renders it impossible to secure lumber fast enough to finish the flume. The mine is looking in splendid shape, and opened in such a manner that at any time the mill starts it can furnish ore enough to keep it running to its full capacity At present only such ore as is necessary to remove in order to develop the mine ready for a heavy production of ore is being raised. The 400-ft crosscut is nearing the rich body of ore found on the 200 level. The crosscutting on the 500 level is being pushed with as much speed as possible, and as soon as the vein is cut on the 500 level, the work of sinking to the 800 level will be resumed.

UTAH.

ONTARIO CO.—Salt Lake *Tribune*, Oct. 10: A new 3 compartment shaft is being sunk on the Last Chance claim belonging to the Ontario Co. Two of these compartments are for hoisting and one for pumping, the shaft being 21x8 ft. The machinery is very massive, weighing over 500 lons, including the pump and engine. The shaft, now down 160 ft, will connect with the 600 level. The drain tunnel driving to connect the mine with the mill is now in a distance of some 280 ft. When finished, it will be nearly 1 mile in length, and it is the present intention, if possible, to finish it within 2 years.

VARIOUS MINES.—The Barbee & Walker mill was started up several weeks ago and has been running steadily since. The ore deposits are improving, the extreme north stope on the 4th level north showing a face of ore 14 ft thick. Work continues on the Lead's mine with a moderate force, principally upon ore. There is upwards of 500 tons ready to be landed on the mill floor as soon as the repairs are completed In the Stormont mine a strike is reported in the 3d north drift. The face of the winze now sinking to connect with the 3d and 4th drifts south shows a stream 2 feet ledge with rich ore. At the Utah, drifting for the vein on the 340 level is being pushed ahead. It is expected the vein will be cut about 30 ft from shaft. The Empire has discontinued the work of tanking for the present. They expect, however, to resume operations about the 1st of the month. The building of the hoisting works still continues. The Tidal Wave has abandoned its old shaft on account of bad air, and a new one has been commenced. At the Pilgrim mine 45 men are employed. They have about 100 tons of ore on the dump, and will ship to the Park City smelter as soon as the new grade is completed. The Pinyon is a fine and well developed mine, and were the pending litigation at an end, would easily add one-third to the present bullion output of the camp.

UTAH ANTIMONY.—The first shipment of antimony from Utah to Baltimore, which upon being worked was found to yield from 60% to 65% of antimony, should mark the beginning of a new branch of business. Central Utah has immense deposits of this mineral, and there is certainly no longer any necessity for importing it, as we have been doing for years, and paying a duty of 10% ad valorem.

THE GREAT BASIN MINE.—This property under the management of Genl. P. E. Connor, is now in splendid condition and making a large and profitable bullion production. The daily output of ore amounts to about 60 tons, all the engine can hoist, a fact that admonishes the management of the necessity for a more powerful engine and a new or enlarged shaft, as the stock of ore is ample and will bear heavy drafts upon it for a long time.

WASHINGTON.

SILVER ORE.—The press of this Territory contain accounts of rich silver ore having been discovered in the vicinity of Mt. Adams, one of the lofty peaks in the Cascade range. Some of this ore is reported to have assayed as high as $66 per ton.

RESPONSIBILITY OF ENGINEERS.—Investigation into the recent Morelos accident in Mexico, where a train plunged through a bridge into the river with terrible destruction of life and property, has resulted in a verdict of the department of public works finding the chief engineer of the company and the government engineer responsible, and steps have been taken to proceed civilly against the company, and criminally against the engineers. If bridge builders and engineers were always to be held responsible, criminally, for accidents resulting from failure of their structures, the effect might be to increase the cost of many of the structures unnecessarily, but it is doubtful whether it would be just or serve any good purpose. Men do not build bridges intending to have them fall.

COLORED children having entered the public schools at Galena, many of the white children went home, and two of the School Board resigned.

Academy of Sciences.

Want of epace prevented onr reporting tbe reguler meeting of the Academy of Sciences. Dr. Behr was in tbe chair. Wm. Robinson, Principal of the Hamilton Grammer echool; Andrew J. Hatcb, Surveyor-General of Nevada, and F. S. Donty, Secretary of the Pacific Improvement Company, were elected resident memhers, Mrs. John R. Sargent was proposed for memherehip.

Animal Foseils of Santa Clara County.

Among the donations to the mnsenm were the following: From L. P. Alexander, of Santa Clara, presented throngh A. W. Sexe, M. D., a fragment of an entire cross section of a fossil elk horn, thrown up Angnst 1st, through the month of an artesian well, 487 ft. deep, bored on the farm of Mr. Alexander, near Lawrence station, on the Southern Pecific railroad, ahout a mile and a half northward on the Alvieo road. The diemeter of the bore was 10 iuches, located in a deposit of sandy clay and gravel, nnderlying a stratum of clay 20 ft. thick. The accumulating numbere of similar animal fossils, found at various depths, in the alnvium of Santa Clara valley, in artesian wellborings, or in the material ejected by the outflow of these wells, are rapidly increasing in interest to the ecientific student, as bearing directly on the now almost certain fact of remote geological subsidences and local elevations about the Bay of Sen Frencisco. It is pretty generally accepted that the Golden Gate was opened by a rupture during some such cataclysm, and eome incline to the helief that many thousand yeare ago the Pacific ocean extended to the foothills of the Sierra Nevada mountains. Goat island, in our bay, and all the stratifications of the exposed parts of monntains, appear to indicate local elevations bnlged up by side pressnre. A very large and perfect stone Metate, with its grinding stone, nsed by the Indians in grinding ecorne and grass seed, wee presented by John Berker, of Sumner, Kern county, Cel., which wae dug up in that neighborhood. Mrs. Mary Melrose donated an anoient stone pestle, dng up in Sen Jose.

Indian Trout Hooke.

B. B. Redding presented an Indian trout hook and line, nsed hy the Shoshoncs. He described how they nsed these very ingeniove contrivences, curious as showing the ingenuity of man in procuring food. The hooks are mede of eharp fishhone, back of which is placed a willow stick to act as a epring to keep the hook in the fish's mouth, answering the eame purpose as a berb on steel hooks used by us. He then described certain large arrow heads, of which there are three in the Academy's mnseum, and said he had jnst leerned their nse from the practice of a Shoshono chief. They were nsed as the head of the officiel speer of the chief of the trihe, and were the emblem of his anthority. They were only nsed when the trihe was celled together in council, and were affixed to a staff usually about 7 ft. high. They are rarely found. Prof. Cope has two, the Smithsonien Institute hes six, and the Harvard museum three. He knows of no others. They are best described ae the emblem of a chief, and are not "fleshers," as eome have supposed. Varioue intereeting donations were then made to the library, inclnding a eet of Mexican meteorological reports of their Netional [observatory, which may well repay a carefnl study.

Analysis of Recent Arctic Advices.

Charlee Wolcott Brooks heing called upon to explain to the Academy the letest reports from the various Artic expeditions now at the North, gave a concise synopsie of the verious details of Arctic newe which have thns far heen received this autumn. He illustrated on a large map the course of the recent cruise of the *Corwin*, and Capt. Hooper's gallant exploit in landing on Wrangel Land. He sifted and compared the various stories given by native Tschuktchie and Innuits, in Siheria on the Russian coast and in Alaska on the Americen side, and expressed the belief that they referred to either or both the whaleships *Vigilant* and *Mt. Wollaston*. He ehowed very plainly that if the *Jeannette* ie succeeding in what she hee undertaken, she mnst necessarily he far north of where any vessel from which we have since heerd could posiihly have commnnicated with her. We have no reports from any part of the Artic hasin farther north than Point Barrow on one side, and ebout the latitude of Herald island on the other. The *Jeannette* should be at least eix degreee farther north, and may be working through across the Polar region, and may eventually come down along the coast of Greenland on the Atlantic side. Thie was her aim, and the brave De Long and his heroic band will eurely do it if their most earnest efforte can ensure success. The *Jeannette* was abundantly fitted for a three years' cruise, with provisions enough to eke out five years. At the date when we

Last Heard from the Arctic,

Namely, Ang. 16, 1881, it was only one year, 11 months and 12 days since the *Jeannette* wae last seen, Sept. 4, 1879, eteaming northward, near Herald island, along a channel of water, heading for the Pole. We cannot think ehe wintered the firet winter eouth of latitude 78° north, while Herald ieland ie in about 71¼° north. Should any inquire why relief veeeels have heen eent, under these circumetancee the answer ie very clear. They were sent to he prepared and ready at the point of exit from the Polar ice along the southern edge of the ice peck to render assistance in case of any accident to the *Jeannette*, in which event her crew, well snpplied with dog sleds, doge and provisions, would have made their way southword on tho ice and have heen rescued hy the relief vessels. It is well nnderstood hy all scientific societies that anch relief vesseleshould he on the spot reedy and prepared to assist at any time a vessel, which, like the *Jeannette*, has heen pnt into the pack hy her commander, with a view of advencing as far toward the Pole as may be possihle. Other nations have edopted a like policy. Mr. Brooke then gave the experience of the steamer *Proteus*, which took the Greeley party to Lady Franklin hay, in latitude 81° 40′ north, and after landiug them without any material delay from ice, retnrned to St. John'e, N. B., reaching there after an ahsence of only 70 days.

All Accounte Agree

Thet along the track taken by the *Jeannette*, and where ehe aims to come out, the season hes heen a most nnusnal and exceptionally open one, and the Artic hed much open water for two months last winter. This was also true on the coast of Greenland, elthongh ahont Nova Zemhla the eeason was severe. All things seem to favor the *Jeannette's* progress northward, and Mr. Brooks concluded hy expressing his firm helief that she will he heard from hy next July, perhaps on this eide, hut quite as likely on the Atlantic, which will he the glorious echievement for which her voyage was planned and undertaken. After describing the ocean currente this season obsnrved in the Arctic, allusion was mede to a marine buoy which got adrift from the Amoor river, near De Castrie's bay, in Siheria, having on it Rnssian characters, which had recently heen reported to have heen cast ashore upon Vancouver Island, on our coast, hy the action of the Kuro Siwo, or Japanese Warm Stream.

Metallurgy of Nickel.

At the recent exhihition of the Germen patents and designs the metallnrgy of nickel and cohelt wes illustrated in an interesting manner by Fleitmann & Witte, of Iserlohn. Dr. Kollmann descrihes it as followe:

It is only within a few years since the discovery of pure malleable and weldeble nickel hy Dr. T. Fleitmann, that nickel has entered the renk of those metale which are technicelly employed on a lerge scale. Previously, only the alloys of nickel with copper end other metals could he easily wrought, while pure nickel could he neither hammered nor rolled. The reason of this was thet pure nickel absorhs (occludes) gases while melted (Fleitman thinks it is carhonio oxide), and the nickel cannot be worked nntil these gases are removed.

Fleitmann's procese for meking nickel malleable consists in adding a very emall trace, only one-twentieth of a psr cent., of magnesium, which is introduced in the form of a har into the liquid nickel while in the crucihle. This small percentage of metallic magnesium renders this brittle metal perfectly malleeble, and it can even he welded. Magnesium is well known to oxidize very easily (at high temperatures), and hence eerves to remove these injurious gases. (Would not phosphorus accomplish the seme end?)

The extraordinary tecbnical importance of the new discovery (which is alreedy patented in all countries) is evident at once. Formerly, alloys with comparetivly only a little nickel could be used, say, for coin. The German 10 pfennig pieces (like the American 5 cent piece) contain only 25% of nickel to 75% of coppsr. Now, on the other band, we can have pure nickel cast in any desired ehape, and also forge it and roll it like iron or eteel. We mey, indeed, assume with tolereble certainty that if Fleitmann's method had heen known 10 years ego we Germans would not have been pestered with our unhandy little 20 pfennig silver coins, for much more convenient ones could have heen stamped from pure malleahle nickel. Pure nickel, in addition to its melleability, possesses the great advantage that it does not lose its luster in moist air and ie nnaffected hy organic ecids, while its alloys, we know too well, gradually lose their luster and tnrn reddish.

Fleitmann, in his very interesting investigation, also made the discovery that pure nickel treated with a very little megnesium, becomes weldable just like iron, and upon this he founded a method of welding nickel to iron. Thie discovery has gained very considerahle importance, eince we are now ahle to weld plates of nickel on both sides of the iron or eteel, instead of merely depositing ou it a thin coating hy electricity.

The question of welding, which is not yet settled in the metallurgy of iron for Bessemer metal, for example, may perhaps he solved in a manner similar to that in which Fleitmann solved it for nickel. Its importance technically and economically can hardly he overestimated. Nickel made hy the new process with magnesium has a resemhlance to carbureted, malleable iron.

Kollmann made a series of teste of strength with Fleitmann'e nickel, and arrived at a surprising result, namely, that the elasticity as well as the absolute strength correeponde exactly with thoee of medium hard Bessemer steel.

The expansion by rolling aud forging of the two metals is the eame, eo that they can he rolled together.

Kollmann then givee some of the nnmerical resulte of his teets, which we omit, hnt they go to show that the physical properties of nickel and iron are very analegous, eo thet the thought arises that perhaps nickel is, after all, only an allotropic state of iron!

Since nickel and steel expand equelly, blocks of nickel can be welded on hoth sides of an ingot of steel, and the whole rolled out into eheete of any desired thickness already covered with nickel. Iron wire covered with nickel conld he drawn out jnst like ordinary wire. Another advantege is that the welding as well as the melting temperatnre of steel and nickel is close together, eo thet the nickelized steel can he welded as hefore.

Cobalt can be rendered malleable and weldahle in the eame manner, *i.* e., hy the addition of a little magnesium.

Fleitmann has also discovered that not only can nickel and cohelt he welded on steel and iron so as to form nickel-plated wire and sheets, hut that it can he welded on to tbe alloye of copper and nickel, which can he rolled at a very high temperatnre. In this operatiou the metals to he welded are surrounded with thin sheet iron, which is afterword dissolved off, or is heated in an eir-tight apperatus. In this way, too, sheet iron can he comhined with elloys of copper and nickel hy welding.

To prevent articles made of nickeled eteel or iron from rusting on the cut eurfaces, the iron heneeth is dissolved awey et the edges with dilute acids, and the projecting nickel then hammered down and welded over it. In Birminghem, H. Wiggin makes nickel malleahle hy adding 2% to 5% of mauganese.

The State Bag Factory.

The State enterprise looking toward tbe cheep production of grain hags by the labor of conviete at San Quentin is progressing, and Gov. Perkins' proposition to cheapen burleps, employ convicte, and still not come into competition with legitimate local menufacturing enterprise, will soon he put to a prectical test. Those who have the enterprise in hand are quite confident that the convicts can be made self-supporting, and at tbe same time begging material cheapened, which will be a merited hoou to our grain growers. If everything snceeeds as now anticipetcd, we may ere long he growing jute, and then the great drain for hegs and burlaps paid to the manufactories at Dundee and Calcutta will be stopped.

For the jute-meking effort it was necessary to bnild new buildings, and the main pert of the work wes done by the convicts. A reporter for the *Chronicle*, who lately visited the prison, gives a description of the new jnte factory, from which we shall take the leeding points: The buildiog is of enormous proportions, and is designed from the letest approved plans submitted as hest adapted for heevy mechinery running with strong vibratory motion. Ite ground plan is a parallelogram for the main building, which is 265 ft. long, extreme length, and 153 ft. wide, extreme width. The floor in preparation is solidly packed and tamped with the hest quality of gravel and seud, hetween closely-leid heavy timhers of redwood, and then cemented into a smooth, heevy concrete with Portland cement, meking it is as solid as if of stone foundation. The building is of one etory, with 16 ft. in the clear; from the floor to the hottom of the joists above is a succession of eight-gable roofe, each of the seme width and running laterally the fnll width of the building.

Each roof is covered with tin, and has on top a gable line of ventilators 3 ft. high by 5 ft. wide, running the entire width of the building. On the north side of each roof from the hottom of the ventilatore rune a sky-light 5 ft. wide throughout the entire length of the roof. The huilding to begin with ie framed from selected pine and redwood, and eo bracod and trussed according to tbe latest eccepted plane from Dnndee, Scotland, ae to deetroy the tendency of the machinery to vihratory motion. There are within the building, as sopports, 126 messive uprights of pine, each properly fitted to cross pieces, besides heing fastened firmly within the concrete, and all to he covered with tin to gnard against fire.

The machines—menufactured in Leeds, England, and embracing a complete symtem of 100 looms, with eoftening, breaking, damping, twisting, werp and cop winding, spinning, dressing, measnring, sack-cutting and calender machines, total 148—are all at San Quentin in perfect order, even to minute details of extras belonging to such thorough and complicated machinery. Although the building, as just described, is independent in itself, constructed with a view to ite heing entirely free from vihration, it is inclosed by massive hrick walls, 25 ft. in hight, and with piers at each 15 ft. snpporting lateral heavy timhere holding the line shafting, thns adding to the eolid character of the structure. A helt chamber, to regnlate the revolntions of the various lines of shafting from which the different machines are run, starts from the flywheel on the west eide and runs the full length of the building, having a full width of 7½ ft. within the huilding.

In addition to the main bnilding an engine and boiler-room ie heing erected adjoining, with a length of 60 ft. hy 40 ft. wide. The ground for the same has heen excavated to a depth of 12 ft., and ie being filled in with solid maeonry to form a thorough support for the engine and hoilere, which are of maseive pattern. The motive power for thie vast etructnre consists of four eteel hoilere, each 16 ft. long by 53 inchee wide; a low presenre engine of 480 horse-power, having a 30-inch cylinder with a 60-inch stroke. The fly wheel drivee tbe main belt, which has a widtb of 42 iuches. The wheel itself is 18 ft. in diameter end has a full weight of 20 tons. The factory is expected to he in complete working order by Jenuary 1, 1882.

Dissenting Opinion in the Debris Case

We gave lately an abstract of tbe decision in the "slickens case," mentioning merely that a dissenting opinion had heen filed by Judge Sherpstein. As the dissenting opinion brings forward some significant points, we give it in full:

I dissent. It eeeme to me that most of the grounds upon which it is claimed that the "act to promote drainage" is unconstitutional cennot he considered in this cese. Courte will not listen to an objection made to the constitutionelity of en act by a party whose right it does not affect. A stetute is assnmed to he valid until some one complains whose righte it invedes. (Cooley's Const. Lim., 163.) In the language of the Code, "Every action must he prosecuted in the neme of the real perty in interest." This ection is brought hy the people of the State, and if the provisions which effect them aro constitutional, they are not necessarily affected hy the other provisions of the act, even thongh they be unconstitutionel. "A statute may contain some euch provisions, and yet the same act, having received the senction of ell hranches of the Legislature, and being in the form of law, may contain other useful and salutary provisions not ohnoxious to any just constitutional exception. It would he inconsistent with all just priociples of constitutional law to adjudge these enactments void beceuse they are essociated in the seme ect, hut not connected with or dependent on othere which are noconstitutionel." (Id. 177.)

I know of no provision of the Constitution, and am not advised that it is cleimed that there is eny, to which this act, so far as it provides for the reclemetion of overflowed lands, the rectificetion of river courses and the impounding of debris, at tho expense of the State, under the direction of commissionere end directors, named in the act, or whose appointment is authorized hy it, is repugnant. But it is claimed that the power conferred upon the Board of Drainage Commissioners, to fix the houndaries of drainage districts, is legislative in its character, and cennot he delegeted to the executive officers, who, by virtue of tbe act, constitute that hoard. "One of the settled maxims in constitutionel lew is, that the power conferred upon the Legislature to meke laws cannot he delegated by that depertment to any other hody or authority." (Id. 116.) If the act under consideretion attempts to delegate that power to any other depertment of the Government, or to any hoard, person or persons whatsoever, it must be held to be, to that extent, at least, unconstitutionel.

It can meke no difference whether tho attempt is made to confer tbet power upon another department of the Government, or upon persons not connected with the Government. The power cennot be delegeted.

The objection, however, ie not that an attempt is made to delegate the law-making power to a hoard of drainege commissioners, hut that the act authorizes the hoard to estahlish drainege districts, and that that is purely legislative. Whether it he or not, I think, must depend upon the object for whicb suoh a district is formed. If formed for the purpose of levying a especial tax upon the property within it, to defray the expenses of improvements, assumed to he more beneficiel to the inhahitants of euch district than to others, the rule douhtless is thet the Legislature must determine what shall constitute such a district, nnless the nature of the case conclusively fixes it. The object of dividing the State into districts, as steted in the act, is not for the purpose of determning what portions of the State ehall he assessed or taxed to pay the cost of the work. Each district is to he composed of "territory drained hy one natural system of drainage." It seems to me that the formation of districte upon that plan would require engineering rather than legislative ekill.

Whether the designation of officers, commissioners, or persons to determine within what limits lands shall he held to be benefited hy an improvement, would constitute a delegation or legislative power, is a qnestion which, as I view it, doee not arise in this case.

I am not satisfied that the Legislature did not possess the constitutional power:

1. To appoint the officers named in the act as a hoard of drainage commissioners, with power to divide the State into drainage districts and to organize the eame.

2. To authorize the Governor to appoint directore to prosecute the work contemplated by the act, within any snch organized district.

3. To levy a State tax for the purpose of raising money to defray the expenses of said work.

Unless some or all of these provieions of the act are unconstitutional, this action cannot, in my judgment, be maintained.

The prayer of the complaint is:

"First—That said defendants and each of them be onsted from said office of director of drainage district No. 1 of said State.

"Second—That said defendante be perpetually enjoined and restrained from letting any contracte for the huilding of dykee, embankmente or other works for the drainage of said district.

"Third—That eaid defendants be perpetually enjoined from levying any tax whatever upon the property, or any property within said dis-

trict for the purpose of providing funds for the payment of the cost of building works of drainage, or any other purpose.

"Fourth—For the decree of this court determining that said asserted drainage district No. 1 has not been legally formed, and is not a drainage district."

For reasons which I have stated, I do not think that the act is so clearly unconstitutional as to entitle the plaintiff to the relief prayed in the first, second or fourth paragraphs of the prayer. As to the third, I do not think the people of the State can be heard to object to the levying of a tax upon property within the district designated. As before intimated, I think that the legality of that tax can only be called in question by some person or persons who, if its collection be not enjoined, will be liable to pay some part of it.

It is not claimed that the people of the entire State occupy that position.

The conclusion at which I have arrived is, that if all these provisions of the act which contemplate the raising of funds by taxing or assessing any property other than that of the entire State, should be held to be unconstitutional, the defendants could not be ousted from office, nor enjoined from letting contracts, nor, in this action, from levying a tax within the district specified. And if the act be constitutional, to the extent to which I think it to be, it is quite clear that this court cannot hold that said district has not been legally formed.

It is not being clear to my mind that those provisions of the act which affect the people of the entire State are unconstitutional, I think that the judgment of the court below should be affirmed.

The Engineer.

A Big Drainage Scheme.

The telegraph of the 6th inst. announces that a Mexican firm—Mierceles & Co.—has entered into a contract with the Mexican government to drain the valley of the City of Mexico for the sum of $9,000,000.

The City of Mexico is situated near the center of a large elevated valley, known as the Plateau of Tenochititlan. The waters of this valley, which has no natural outlet, are deposited in five principal lakes, situated on different levels. The largest of these is Tezcuco, upon an island in which, mostly of artificial construction, is located the City of Mexico. This lake, which is near the center of the valley, has an area of 70 square miles, and is the lowest of the series. Just north are two other small lakes, and to the south, connected by a narrow strait, is a third—Lake Chalco—covering an area of 50 square miles. These three are only five ft. higher than Lake Tezcuco, upon the waters of which the city is built. The fifth in the series is only 25 ft. above the city. The drainage of this entire valley, which is collected by some 12 or 15 small streams, all finds its way eventually into the lake surrounding the city. The only drainage from this body of water is through an artificial canal 12 miles long, cut through solid rock, in some places 150 ft. deep and 300 ft. wide. The waters of the Tezcuco are salt, while those of the others and more elevated lakes are fresh.

It is presumable that the drainage scheme proposes to remove the water immediately surrounding the city by deepening the present canal.

Success of Underground Telegraphy.—Five years ago it was determined to construct a complete system of underground telegraph lines, uniting the most important commercial and strategical points in the German Empire. The plan also covered the construction of governmental overground telegraph lines, and the erection of buildings for postal and telegraph service, as well as a system of pneumatic pipe mail lines. Five years were allotted for the completion of the entire work, at a total expenditure of $12,480,000. The work is now finished and has cost some $10,360,000. The overhead telegraph lines have been increased in five years from 23,600 miles to 32,913 miles, giving an increase of length of wire of 21,735 miles, while the stations increased from 1,688 to 5,671. The total length of cables amounts to 3,403 miles, including about 23,000 miles of wires. The total weight of iron used in these cables amounts to 24,144,730 lbs. This system now avoids the numerous interruptions to business that formerly occurred from such a great variety of causes as overhead telegraph lines are always subject to. The number of cities and towns thus connected is said to be 221. All the lines thus far laid have proved highly satisfactory in operation. Most of the cables contain seven wires, and a few only four.

Progress of the Panama Canal Scheme.—The manager of the Panama Canal company has recently arrived at New York, from the Isthmus. He states that the work on the canal is advancing rapidly. Twelve hundred men are employed at present in excavating, and he expects to have 8,000 at work by December. The sum of $2,100,000 has been expended on the work already, and drafts are in the hands of bankers of this city for $500,000 more from share-holders in Europe.

Useful Information.

Paper Car Wheels.

The following particulars in relation to the manufacture of paper car wheels, as given in the U. S. *Trade Journal*, will be of interest to many of our readers:—

The paper is straw board of rather fine texture. It is received in the ordinary broad sheets, differing in no particular from those used for straw-board boxes or other similar work. These sheets, as they come from the paper mill, are square, and must first of all be cut to a circular pattern. This is rapidly done on a large table with a knife that is guided by a radial arm that swings freely over the surface of the table from a pivot at the center. A small disk is also cut from the center of the sheet to allow for the iron hub. Being thus reduced to the required shape and dimensions, the paper must now be converted from a mass of loose sheets into a compact, dense body, capable of withstanding the tremendous crushing force to which it will be subjected in the wheels. This is accomplished in the following manner: Ten sheets are pasted together, one upon the other, making a disk about one-eighth of an inch thick. Enough of these disks having been prepared to fill a powerful hydraulic press, they are subjected to a pressure of 1,880 lbs. to a square inch. When removed the disks are hung on poles in a steam-heated loft and left six days to dry. Thicker disks are then made, each formed by pasting together 2 or 3 of those already finished. These are pressed and dried as before, and the process is repeated until a block is built 4 inches thick and of about the specific gravity of lignum vitæ. After each pasting and pressing, six days are allowed for drying, and when the block is complete it is left in a drying-room until thoroughly seasoned. The next operation is that of turning the paper blocks to fit the steel tires and iron hubs. This is done with as much accuracy and in exactly the same manner as if the material worked on were iron or wood. The circumference is turned to a perfect circle of the precise diameter required, a bed or recess is worked out for the web of the tire to rest in, and the edges sharply defined. The block is then painted, and is ready for its place in the wheel.

Common Glue has most enormous strength and adhesive powers if it is good. But to be good it must not have been injured in the making by decomposition, to which the material and glue itself are peculiarly subject. If offensive, it cannot be trusted to hold wood. The strongest known glue is that made from the sounds and skins of fishes, and the strongest of this class is made in Lapland from the skin of a perch. The Laplanders use it in making their bows, which are both strong and durable. In making it their cold climate is greatly in their favor, there a fish skin will begin to undergo decomposition before it can be dried. In making it the skins are put into a bladder, which answers for a water bath, and heated in water until a sort of glue results.

Bleaching Gum Arabic.—The solution of gum is first strained through linen in order to remove earthy matters, fragments of wood, etc., and is then mixed with freshly prepared hydrate of alumina, which must not be allowed to dry up. The mixture is poured upon a linen strainer, and thus a clear, colorless solution of gum is obtained, while all the coloring matters are kept back by the alumina. It is generally sufficient to pour the solution of gum through a moist layer of hydrate of alumina. The more slowly the gum water is filtered the more colorless it becomes. If perfect whiteness is to be obtained the filtration is repeated through fresh portions of hydrate of alumina.—*Muster Zeitung fur Faerberei.*

Liquid Glue.—A product which is better than that obtained by treating solid glue with nitric acid, can be prepared by dissolving good glue in a water bath containing the same quantity of strong vinegar, one-fourth part of alcohol, and very little alum. It is very applicable to such work which does not need a very strong adhesive power. It is always ready for use, and keeps for any length of time. The manufacturers of artificial pearls use it in pretty large quantities; it also serves for fastening mother-of-pearl, horn, etc., on wood and metal.

Destroying Bugs in Mills.—Alum water is recommended for preventing bugs and worms from infesting flouring mills. Take two pounds of alum and place it in three quarts of warm water (or in that proportion), and let it stand on the stove until the alum disappears. Apply while hot, with a brush, to the crevices of the bolting machine and other places that conceal the insects. Alcohol or turpentine should not be used in sponging off bolting cloth, as they dissolve the sizing.

Tests for Iron.—To ascertain if water contains iron, take a glass of water and add to it a few drops of the infusion of nutgalls, or suspend a nutgall in it by means of a thread for 24 hours. If iron be present, the water will become of a dark brown or black color. Prussiate of potash is a still more delicate test for detecting iron. If a crystal or a drop of it, when dissolved, be added to a glass of water containing iron, it will immediately become of a blue color.

A Peculiar Property of Matter.

A great deal has been written concerning the physical properties of matter, and it would seem, so far as our knowledge extends, the subject was well nigh exhausted. Strange as it may appear, there is one property of the most common substance with which the machinist has to do, that has never been accounted for, or in any way alluded to in works on this subject. We refer to that peculiar property of cast iron, by virtue of which, when in the condition of old cinders, pieces of pipe, safety valves, and a multitude of other forms, it manages to get exactly in the way of every man in a good sized machine shop, and at about the same time. Practical men know this to be a fact, and are looking to science for an explanation. It has long been reasonably well established, that in the shop where the custom is to preserve such things, notwithstanding they may be relegated to some particular corner devoted to their preservation, they will find a way to get themselves distributed all over the shop without any very serious delay. It would be a valuable acquisition to our present knowledge to know why this is so. While carrying on the investigation necessary to determine what particular property enables inert matter to get away with the best intentions of proprietors, foremen and workmen, it might be well to conduct it with a view to finding out what property could be added to cast iron, so that it would be possible to get useless scrap from the machine shop and into the cupola.

There is a broad field for scientific investigation, and in a direction where there can be no possible clashing of theory and practice; the latter having virtually withdrawn from the contest.—*American Machinist*

To prevent corrosion on sheared surfaces of nickel or cobalt, plated sheet iron or steel, Dr. T. Fleitmann of Iserlohn, has adopted the following method, which has proved itself very satisfactory: The sheared surface is dipped into strong sulphuric or hydrochloric acid, until enough of the sheet metal has been removed to answer the object; then the remaining plating is folded over by means of a steel rod, and finally the new surface is heated to a red heat in a closed vessel, or by putting it in a charcoal fire, after having been protected by a covering of sheet metal.

Good Health.

The Management of Sick Children.

The vicissitudes necessarily incident to an out-door and primitive mode of life are never the first causes of any disease, though they may sometimes betray its presence. Bronchitis, nowadays perhaps the most frequent of all infantile diseases, makes no exception to this rule; a draft of cold air may reveal the latent progress of the disorder, but its cause is a long confinement in a vitiated and overheated atmosphere, and its proper remedy ventilation and a mild, phlegm-loosening (saccharine) diet, warm sweet milk, sweet oatmeal porridge, or honey-water. Select an airy bed-room and do not be afraid to open the windows; among the children of the Indian tribes that brave in open tents the terrible winters of the Hudson Bay territory, bronchitis, croup and diphtheria are wholly unknown; and what we call "taking cold" might often be more correctly described as taking *hot*. Glowing stoves and even open fires in a night nursery, greatly aggravate the pernicious effects of an impure atmosphere. The first paroxysm of croup can be promptly relieved by very simple remedies: fresh air and a rapid forward-and-backward movement of the arms, combined in urgent cases, with the application of a flesh-brush (or piece of flannel) to the neck and the upper part of the chest. Paregoric and poppy syrup stop the cough by lethargizing the irritability and thus preventing the discharge of the phlegm until its accumulation produces a second and far more dangerous paroxysm. These second attacks of croup (after the administration of palliatives) are generally the fatal ones. When the child is convalescing, let him beware of stimulating food and overheated rooms. Do not give aperient medicines; costiveness, as an after effect of pleuritic affections, will soon yield to fresh air and a vegetable diet.—*Dr. Felix L. Oswald, in Popular Science Monthly.*

Seasickness.

This is caused in great part by the confusing effect which the tossing on the water has upon the brain, and multitudes of ways have been pursued for avoiding or at least mitigating this annoyance. The best plan is to let it have its course and rid the system of that excess of bile which is almost always present in this overeating age; the general health rarely fails to be greatly improved by it, although in very rare cases, perhaps not over one in a million, the patient dies under the effects of the long continued and exhausting retching.

If a person will lie down with the eyes closed, and not allow the head for an instant to be raised from the pillow, there is an almost entire exemption from nausea and other discomforts, but the result of this course is that it will be necessary to keep a bed during the entire voyage. The effort should be to shorten the sickness and get rid of it as soon as possible, and this is best done by not lying down at all, but resolutely keeping on the feet on deck, in the open air if the weather permits, that is, if it be not raining; this requires moral courage and some considerable force of will and character, but it seldom fails to abridge the period of seasickness, some times to confine it to a few hours duration and then the remainder of the voyage can be enjoyed as it ought to be.

The tendency to nausea on ship-board is abated somewhat by any stimulus which acts decidedly on the nervous system, such as chloroform, brandy, opiates, etc. Irritants, such as the strongest spices, abate nausea; so will great mental emotions, in short, anything that draws off the attention of the mind. No person can get seasick if the ship be on fire, nor will a person who is drunk. A brisk purgative is good just before going on board, or a dose of medicine taken the night before. Still, the wisest, most healthful and most expeditious method of meeting seasickness is to avoid all preventives, all medicines, and manfully determine to keep upon your feet and let it do its worst.

The Use of Disinfectants.

Our sprightly cotemporary, the *Star*, of Cottage city, the great seaside resort on the island of Martha's Vineyard, through a correspondent, throws out the following excellent hints on the use of disinfectants. They should be used and understood by every person who has occasion to use such preventives of disease:

In the use of a disinfectant, a double object must be secured. First, the removal of objectionable odors; second, the chemical change of the fetid mass from a state of decomposition and production of noxious gases, rendering it harmless. Probably the least useful disinfectants are those which have powerful odors of their own, as carbonic acid in its various forms, chloride of lime, camphor, etc. For, while these really possess disinfecting qualities, they are apt to deceive by covering up what they ought to remove. Carbolate of lime used upon a putrescent mass will disinfect only where it touches, and unless it is thoroughly mixed with the whole, it will affect only the surface, while, by its wholesome odor, it appears to do far more. Chloride of lime does better, for while there remains in it any chlorine, it will absorb and destroy all foul emanations, but it is soon delinquent and inert. Earth is the best disinfectant. When thrown upon a substance to be disinfected, the salts which it contains slowly percolate through it, and it is chemically changed and rendered odorless and harmless. But the quantity required often makes its use impracticable; so various combinations of the salts of metals have been devised to effect the same result, as the celebrated recipe purchased by the Austrian government and the Gironden disinfectant, both of which are composed of salts from metal bases.

Within the reach of all, however, and certainly effective, is common copperas (sulphate of iron). It can be purchased of any druggist, at from three to five cents per lb., in the crystal, and when used it dissolves slowly in the moisture which it finds, and not only locks in chemical fixedness, the foul-smelling sulphureted hydrogen gas, but it stops fermentation, and thus prevents the formation of microscopic insect or vegetable life, which, taken by the air we breathe, induces fever, diphtheria and other diseases.

Women as Doctors.

At the recent commencement of the Women's Medical College in Philadelphia, some interesting facts were stated concerning the career of the graduates of that institution, which have a direct bearing on the success of women in this field of professional labor. The following are the more important of these statements: Of the 276 women who had graduated from the college in the past 30 years, 32 had died, 31 had given up their profession, and 151 were then practicing. Of the 151 in practice, the incomes of 24 were between $1,000 and $2,000; the incomes of 20 were between $2,000 and $3,000; of 10, between $4,000 and $5,000; of 3, between $5,000 and $15,000; of 4, between $15,000 and $20,000; and of 10, less than $1,000. The average income from practice was about $3,000. Sixty-six were members of medical societies; 51 were married after studying medicine, and 61 before; of 50 who were married, 43 reported that the practice of medicine had no unfavorable effect on their domestic life; with 6 the effect was not entirely favorable; with 1 it was unfavorable; 3 were prevented by practice from marrying, and 5 gave up practice on account of marriage.

These facts make an exceedingly favorable showing for the women doctors, and should be a convincing argument in favor of the practice of medicine by the sex. Indeed, the opposition to them has so materially lessened during the past few years, that it can hardly be said to have any existence since the majority of the medical societies have withdrawn their opposition.

Sheet Zinc is used to a great extent for ceilings in Germany, especially where the beams for the upper floor are made of iron. The use of wood is entirely dispensed with, and excellent decorative effects are produced by stamping, painting and gilding or bronzing a part of the ornaments.

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Business Announcements.

Hose Coupling—D. B. Kendall, S. F.
Regular Dividend Notice—Northern Belle M. Co., S. F.
Extra Dividend Notice—Northern Belle M. Co., S. F.
Patent Pick—P. W. Reardon, San Jose, Cal.
To Contractors—New Almaden Mines, Santa Clara Co.
To Shaft Men—New Almaden Mines, Santa Clara Co.
Miners Wanted—New Almaden Mines, Santa Clara Co.
Tonite Powder Co, San Francisco.
Tamalpais Hotel—San Rafael, Cal.

Passing Events.

In mining movements and matters, the week has been uneventful, the great industry throughout all our vast mining domain having been unmarked by other than the nanal advances, mishape and fluctnations. The recent epurt in Comstock shares, having snbserved the ends for which these spurts are gotten us, has subsidsd. While no important developments have lately heen made or are likely to he made on the great Washoe *Veta Madre*, it may intereet the payers of assessments and the losers in the late Sierra Nevada gamble to know that the donkey engine is doing its work bravely on the "Burro" ledge, and that all the pumps along the "great non-metalliferous," from the "Ragtag" to the "Bobtail," having been run constantly for the past ten months, there is every prohability that a water dividend, of 500,000 gallons to the share, will he declared towards the end of the year.

The working miners, as it was expscted they would do, have during the week commenced gravel washing on a number of hydraulic claims, the owners of which had been restrained from oparating the same hy injunctions issued hy the courts. As yet, these men have not heen molested, and many of them are of the opinion that no legal measures will he taken to estop them from going on with their work.

Besides a healthful progress in gold and silver mining, there is to he noted a good deal of activity in several other branches of the husiness, nearly all of which, though they have at one time or another heen greatly depressed, eome of them almost to the point of extinction, are now fairly prosperous. Thus, the prodnction of horax, lead, coal, eulphur, copper and quickeilver ie now remunerative, though there have been seasons when none of theee commoditiee could here he made or mined with profit. So, also, we have at last got to making iron in California with every prospect that the enterprise will prove a snccess. Nitre deposits of enpposed value have lately been found in Nevada and are about to he worked. Salt ie being, and for many years has heen, gethered in great quantitiee in that State. We are also mining antimony, manganese, mioa, end varions other metels and minerals in a emall way at different points on the coast.

Quite recently we heer of efforts heing made at reviving gold mining in the extensive region lying to the east of the Similkameen country, British Colnmbia. This is the work of the old campaigners who, rushing into and over that country eome 15 or 20 yeers ago, left it for the virgin mines of Ideho and Montana, well knowing that they had only skimmed the surface of these hastily ahandoned districts. Encouraged hy the rapid approech of two overland railroads into that region, these old-timere return, well knowing that they go hack to a good thing, these mines having eince they left heen hut little worked. Just now the old Kooteney district appeare to he the scene of the most importent mining operations in that quarter.

California Mines and their Occupants.

In many respects mining in California is pursued under conditions widely different from those that exist in the other Statee and Territories west of the Rocky Mountains. Out of these differences, which are due to a variety of causes, there arise many advantages to those engaged in the husiness in this State. Among other noticeable features that distinguish the California mines is the great linear extent of her principal gold field, which, striking along the lower slopes and ontlying foothille of the Sierra Nevada and trending on the north, westerly into the Coast Range, extends with hut little interruption through more than eight degress of latitude.

Beginning near the southern boundary of the State, this auriferoue helt, hearing N. N. W., reachee clear to and heyond her northern border. Nowhere else, perhape, is there to he found a metalliferons zone of such great length so little interrupted hy barren spaces, the latter amounting to hardly more than 10% of the whole. Tbis zone varies from 20 to 60 miles in width, its average width heing about 40 miles. The climatic variatione along it depend more on elevation than latitude. As its westerly, lower half attaine hut a moderate hight above the sea, it is characterized by warm summers and nearly snowlese wintere. Along its easterly margin, which everywhere reaches a considerable altitude, and at some points extends quite to the summit of the Sierra, the snow falls to a great depth in winter. Still, the degree of cold here is not excssive; few of the larger lakes and streams ever freez ing over even in the coldest winters. To obtain ice of a desirable thickness for storage is alwaye a difficult matter. This gold-hearing helt ie everywhere well watered and timhered, large creeks and rivers crossing it at short intervals, and eplendid forests of oak, pine, spruce end cedar covering nearly the whole of it.

In a sanitary point of view the climate is nnrivaled, there heing nowhere in the world a more healthful region or one hetter fitted for the hahitation of civilized man than this coastwise-lying conntry and these foothill lande of the Sierra Nevada.

Another peculiarity of onr minee rests in the fact that the gold here occure under conditione so varied as to widely diversify the methods and appliances employed for searching after and procuring it. Out of thie feature of our auriferous deposits have grown the multiplied forms of mining here in use, snch as the hydraulic, tbe drift, the wing-dam and other novel modes of gold gathering peculiar to California. Then, hesidee onr gravel hanks, river heds and pliocene channels, we have our seam diggings, gold bluffs and beaches, all a clase of deposits rare in other conntries, some of them having elsewhere never heen met with. Of course, none need hs told that we practice here vein mining on an extensive scale, auriferous quartz lodes occurring in great numher throughout all parts of our gold fields.

With mineral resonrces so diverse in kind and so widely disseminated, the husiness of gold mining gives here employment to a numerous ponulation, the most of whom work for themselves on their own claims, upon or near which they permanently reside; for it is to he remembered that the present occupants of the California mines are not now the restless, nomadic crowd they once were, ready to pnll np stakes and stampede for the site of any rumored hig find, however distant or difficult of approach. On the contrary, the denizens of our minee are, at this day, rather noted for their stahle hahits and stay-at-home proclivites, a disposition that has grown strong npon many of them of late yeare.

This comee of the fact that multitudes of these men, excited hy the rumors of rich mineral discoveries made afar off, having in times past, egain and again gone away in searoh of the seme to their great disappointment and detriment, have at last determinsd to remain in their old haunts working the mines there for what they are worth.

In considering the growing indieposition on the part of our miners to roam ahout, there is also that element which conoists of the young men horn in the minee to he taken into the account, and who having their homee and attachmente there, cannot easily he lured away.

Moreover, it ie the case that very few of these yonth are heing oonsumed by that spirit of enterprise that prompts ambitious young men to tie up their worldly effecte in a cotton handkerchief and seek fame and fortune ahroad. The numher of these who will reach the Presidency by way of the tow-peth will probably he small.

Nevertheless, it etende to reeson that the most of these yonng people will have to go to work at something or another, and as there is not much else for them to do, they will neceesarily have to engage in mining; and they will have to do this where they are, for, while some of the far out-lying countriee may open a hetter field for the experienced and hardy prospector, these would, as a general rnle, prove hut a poor place for the California born boy who, reared in a genial climate, enjoying every comfort and many luxuries, would find it hard indeed to adept himself to the coerse fere and thorough life incident to the pioneer mining camp. Wherefore, hetter it is he remein amongh is friends and there live and lahor near the epot of his hirth. We could wish his capecity for doing reel hard work were hetter than it ie, for it ie in thie perhaps, rather then in an unwillingness to work that the California hornhoy is deficient. Spirited and tolerably well developed of limh he may he, hut that he lecks stamina—the ability to perform severe mannal lahor, there is no denying.

But, for all this, he will have to make the effort—he will, in fect, have to actuelly perform a good deal of downright hard work, getting through with it in some sort of way at least. And hy heginning right he will, we fancy, get through with it pretty well. Let him commence moderately, doing light work and ehort hours till he gets inured to the business. In this way it is surprising how eoon even a slender, dclicnte youth, lahoring in the fresh air and the sunshine, with regular hours, steady hahits and wholesome diet, developee into a strong, vigorous man and good worker. If the industrial neophyte at times hecome a little tired, or even pretty badly nsed up, this ie not always an unmitigated evil.

Mucb etrenuous effort, some self denial, a little hardship, not to say absolute suffering, does not always hurt us humans. We are here to strive and endure, not lead lives of sensual indulgence and unquelified ease. This passive sort of existence may do for tbe hivalve hut not for man, whose appetites will make him captive if not restrained by reason, and whose faculties will decay and die if not duly exercised in every healthful direction. The happiness that comes of mere inaction is the enjoyment of the clam at high water. Dend matter is quiet enough. The lifeless tree, the stone, the extinct volcano, have no troubles. Man, belonging to the highest order of intelligence, has the most of these. And since this is so, he ehould accept them as being necessary for his welfare and turn them to such account as they seem designed to eerve in the economy of creation. It was not decreed that man should eat his hread hy the eweat of hie hrow nntil it was found that the plan for providing him with everything he required, without effort on his part, was a failnre.

Let not our young friends in the mountains, then, he led away by the heresy that useful, hard work is a thing to he deprecated and avoided. On the contrary, let them hail it as a great good, the practice of which will secure to them health, happiness nnd independence. They live in the hest land on which the eun shines. California is pre-eminently the poor man's country. In no other can the moneyless multitude so readily employ themselves, find employment or make shift, if so incliaed, to get along without any employment at all.

But this latter is an expedient to which, we opine, few of our mountain horn boye will feel disposed to have reconrse, for it must he admitted that, whatever their other faults and deficiences, they are not lacking in a certain epirit of manlinese and independence. They are not what may he termed worthless, certainly not vicious. The typical hoodlum of the larger towns is not much seen in these mining communities.

Still, all too many of these youths are verging toward a stage of incipieut loaferdom, and unless set to work earning an honest living, will become so confirmed in their idle and shiftlese habits, that they will he unable ever to do so. Already a large percentage of them are what in the language of the southwest may he termed "ordinary, no-account, trifling sort of persons;" which condition, if suffered to become chronic, will incapacitate them from ever becoming usefnl or self-snstaining members of society.

Recurring to the remarks with which we set ont, touching our hroad mineral domain with its varied deposite and the advantages to the miner growing out of the eame, let it he remembered hy the on-coming generation, that this great heritage is theire if only they poesess enough indnstry and enterprise to turn its resonrces to practical aoconnt.

PERSONAL.—Mr. C. G. Yale, editor of the MINING AND SCIENTIFIC PRESS, sailed on Monday for San Diego to obtain a brief ohange of air and scene which long and close attention to his work hes rendered necessary. We trust the trip may replenish his strength and give him the freshness of thonght which followe a pleasant respite from conetant application.

THE honee of Washington Butcher'e eone, wholesale provieion dealers hae just failed for $1,000,000 after heing in husineee in Philadelphia for 121 years.

The Hydraulic System of Draining Mines.

(CONTINUED FROM PAGE 249.)

pressnre hy means of plnnger pumpe, *T*, whicb in tnrn are operated hy a compound eteam engine, *O*. These pumps, which supply the accumnlator with water and kcep it at a pressnre great enough to run the two nndergronnd pumps, *P*, take their suction from the reservoir, *N*, into which the retnrn water is discharged.

Now, since this pipe which snpplies the pnmps, *P*, is of such greet length, and moreover, since the whole mass within it must he put in motion and brought to rest again during each stroke of the pumps, *P*, it is evident thet eome mechanical contrivance must be introduced for the purpose of lessening the jar in the pipes ceused hy the sudden stoppage of such an imnense mass of water. The arrangement hy which this end is accomplished, will be reedily nnderstood hy referring to the drewings. It is constrncted as follows: Let *E* (in general plan) he the velve which shuts off supply water from *P*. Close to the underground pumps there are firmly fixed two cast-iron cylinders, *C* and *C*, in which the plnngers, *L*, *M*, cerrying the crosshead, *D D*, ere free to move. On either side of the arm, *D D*, are etrong eprings, *S*, *S*, held in position hy the abutments, *B*, *B*. Now, when water in enpply nnd return pipes is at rest, the arm, *D D*, is exactly in the middle hetween the cylindere, *C* and *C* (since the plungers, *L* and *M*, are eo proportioned that the total pressure on *L* is precisely equal to total pressure on plunger, *M*). But after the underground pump, *P*, has completed its etroke, and the total mass of water in the eupply pipe has to he brought from a velocity = *v* to a velocity equal to zero, the inertia of thie mess (due to velocity *v*) is supposed to he gradually reduced to zero hy the plunger, *L*, *M*, heing forced (on account of extra pressure on *L*) over to the right side. The distance it travels to tho right depends, of course, upon the extra pressure produced by checking the velocity of supply water, and also upon the strength of the springs, *S*, which hegin to he compressed as soon as *L* *M* begins to move. Now, after the crosshead has heen forced over by thie extra pressure to its maximum extent (the water in the three columns also coming to rest at this moment), the compressed springs, *S*, will immediately react to place the crosshead and plungers in their central position, ready to agnin take up the inertia of the mess in supply column on the return stroke of the pumps.

Thus, the object of these springs, *S*, *S*, is not only to assist the water in the return column in taking up the inertia of the water in the supply column, hnt chiefly to replace the plnngers, *L*, *M*, in their central positiou after the masses in the three columns have come to rest.

The general arrangement of tbe eystem having heen described, an account will now be given of the manner in which the work is performed hy the pumps, *P*. In the drawing I have ehown in detail that portion of the nnderground pumps lying hetween the lines, *B* and *B*, on the general plan, leaving out, of course, that portion already explained for taking up the inertia of the supply water.

There are two of these underground pnmps, sitnated on the 2400 level of the mine, hut eince they are similar and work independently of each other, it is necessary to describe hut one of them. They hoth take their eupply water through the valve, *E*. Acting indepsndently as they do, they will not necessarily commence nnd finish their strokes at the same time. But, in order to discuss the eystem under its extreme condltions, I will consider the two pumps as working together, thereby making the velocity of the snpply water and the inertia of the moving masses a maximum.

Therefore, in each pnmp, let *O*, *O*, and *O.*, *O.*, see detail drawing, he the four pressure cylinders, and *T* and *T.*, the pump cylinders for raising the drain water to the Sutro tunnel. Let *V* and *V.* be the valves leading to the pressure cylinders from the supply and return pipes, and let the plungers he connected with a croeshead (es ehown in drawing), so that when any movement of the plunger, *O O.*, takes place, the plunger, *T T.*, will he cerried along also.

Now, let ue follow the operation of tbese pumps, first assuming, however, that the pressure of the water in the eupply pipe is great enough to prodnce motion of the plungers, *O*, *O*.

First, euppose the valves, *V*, to he opened (valves, *V.*, remaining closed). The two plungers, *O O.*, will he forced over to the right, carrying with them the lnrger plunger, *T T*. While *T* travels to the right, the space left hy it is immediately filled with drain water coming through the euction pipe, *W*. Now, suppose valves, *V*, to he closed and the stroke finished, the valves, *V.*, are then opened, and the pressure of the snpply water against the plnngers, *O.*, forces them to the left, and the water remaining in cylindere, *O*, ie forced through the valves, *V*, into the return pipe, and thence into reservoir, *N*, upon the surface. At the eame time, the water which was drawn into cylinder, *T*, on preceding stroke, is now forced (on acconnt of check valve, *C*, closing) through *D.*, into discharge column, *D*, and thence 800 ft. into the Satro tunnel. Again, while this stroke to the left is heing made, the space left hy plunger, *T.*, is heing filled with drain water through euction pipe, *W.*. At the completion of this etroke, valves, *V.*, nre closed and valves, *V*, are opened, the crosshead and plungers again move to the right, and the water remaining in the cylindere, *O.*, ie again forced through return

column into reservoir, *N*. At the same time, the water in cylinder, *T*., is forced upward (on account of check valve, *C*., being closed) through *D*., into *D*, and thence to Sutro tunnel. When crosshead and plungers are again over to the extreme right, valves, *V*, are closed and valves, *V*., opened, and thus the operation continues, the valves, *V* and *V*., being worked automatically by means of tappets carried by the crosshead. The number of strokes made by these pumps evidently depends upon the pressure of water in the supply pipe, and also upon the rapidity with which the valves, *V* and *V*., are opened and closed.

In the preceding, I have followed the action of but one underground pump, but, as I have said before, the two are alike in every respect, and both draw their water from, and discharge it into the same columns.

From the above remarks, it will be seen that the sole object of these two underground pumps is to raise the drain water from the 2400 level of the mine to the Sutro tunnel, a distance of 800 ft. The object of the accumulator, *A*, upon the surface, is to accumulate the water within it, under a pressure great enough to work the pumps, *P*, and the object of the compound steam engine and pumps, *T* (on the surface), is to supply the accumulator with exactly the same amount of water taken from it, to run underground pumps. Furthermore, it will be noticed that the same amount of water which is used to run these pumps, *P*, is returned to reservoir on the surface, from whence it is forced into the accumulator by pumps, *T*, to be used over and over again.

Right here it might be well to mention the fact, that the surface pumps, *T*, have been constructed with a capacity great enough for two more pumping engines, similar to those just described (*P*), so that when a depth of 1,000 ft. more is reached, this extra set of pumps will be put in at the 3400 level, and the process will go on as before. In the event of this new set being started, the velocities in the different columns, as well as the inertias of the masses, will be increased.

A Convenient Apparatus.

(Written for the Press by C. H. Aaron.)

A very convenient arrangement for continuous filtration of a liquid, or for washing a precipitate on a filter, is represented by the accompanying skeleton diagram.

Upon a table, *A*, stands a vessel, *B*, containing the liquid, which latter is conveyed to the filter, *C*, by the rubber tube, *D*. The funnel containing the filter rests in a hole in the tilting shelf, *E*, beneath the table. Upon the tilting shelf at *F* is a counterpoise, which is made stationary on the shelf when the arrangement is used for filtering a liquid. The counterpoise is then so adjusted as to balance the funnel when nearly full of liquid. If the liquid should pass into the funnel too quickly, so as to be in danger of running over, its weight overcomes that of the counterpoise and the shelf tilts, drawing downward the wire stirrup, *G*, which passes over the rubber tube, *D*. The tube is thus compressed, and the flow of liquid checked or stopped, until the funnel has become so lightened that the counterpoise preponderates, when the shelf tilts the other way, the stirrup is raised, and the flow of liquid is resumed.

In practice the machine soon adjusts itself so as to keep the liquid in the funnel at a uniform hight.

When the apparatus is used for washing a precipitate, or for leaching a sample of ore, etc., it is desirable that a certain quantity of the liquid should be allowed to accumulate in the funnel, and that the supply should then be cut off until that has all run out, when a fresh quantity may be allowed to flow in.

To effect this, the stationary counterpoise at *F*, is replaced by a ball, which rolls freely in a small oblong box placed on the tilting shelf. The length of the box is such that when the ball is at the end nearest to the fulcrum of the shelf, its weight is just sufficient to raise the funnel with the substance to be washed, and thus to open the supply pipe. At the same time, in consequence of the tilting of the shelf, the ball rolls to the other end of the box, and in this position has a sufficiently increased leverage to enable it to counterpoise the funnel until the latter is nearly full of liquid; the weight of the liquid then causes the funnel to descend and close the pipe; the ball again changes its position, and the funnel remains down until it is drained, when it again rises for a new supply of liquid.

The interior length of the box in which the ball moves, is easily adjusted by means of inserted blocks of wood, by which means also the ball may be converted into a stationary counterpoise, when so required for filtering purposes.

As used for filtering, this apparatus is described in the *Chemical News*, 1868. The modification by means of a moving counterpoise is my own, and replaces a much less simple affair described in the *News*, in which two tilting shelves, two stirrups, two funnels, and a syphon within the upper funnel, are used.

Too Busy.—It is spoken of as a fact, without precedent in the history of American industries, that large numbers of exhibitors at previous local industrial exhibitions, have been too much pressed with orders during the past season to permit them to produce specimens of their handiwork at the public exhibitions which have been held this fall.

Application of Standard Measures to Industrial Processes.

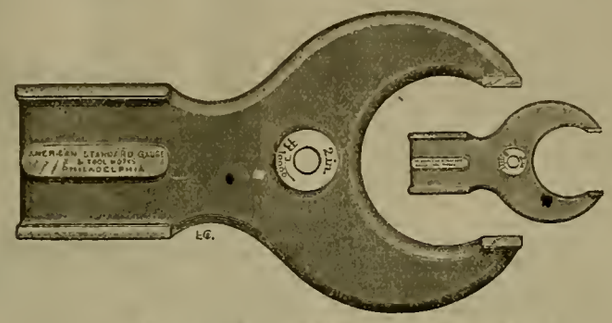
The following valuable and interesting paper was read recently before the California Academy of Sciences by John Richards, Superintendent of the San Francisco Tool company, and we publish it by his permission:

The subject of invariable Standards for dimensions and weight, with the apparatus for determining and comparing, is one of great practical importance, entering as it does into all kinds of industry and commercial transactions.

It has also to do with scientific research, and is fast assuming an international importance, as intercourse widens and exchanges extend.

But little attention of a popular kind has been given to exact Standards. The matter is generally regarded as a scientific abstraction, and I am well aware of the difficulty to be encountered in attempting to treat the subject in a public lecture.

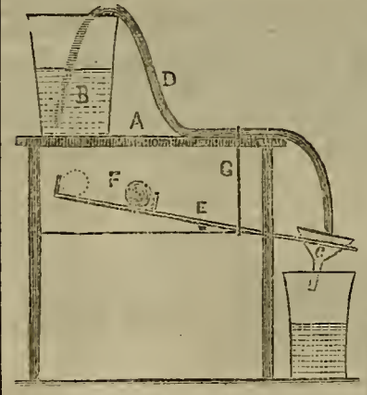
This difficulty will be lessened, no doubt, if at the outset it is considered how far these exact Standards have to do with practical affairs. Common rules, yard sticks with all



CALIPER GAUGES REFERRED TO IN THE PAPER.

lineal measures, so also weights (in common use) and cubic measures, are but derivatives or copies from some Standard; some fountain head, so to speak, which must be resorted to in cases of doubt or dispute.

Every mechanical operation, as well as every commercial transaction, necessarily deals with some Standard—some measure of quantity—either of material or values. The latter is expressed in coin, and this again is defined by exact weight, so that we are continually, in every



Device for Filtering Liquids.

kind of business, dealing with Standards of some sort.

Such Standards have been during the present century adopted by most civilized nations, usually under the supervision of a few scientific men and mechanicians, who are not always anxious to make their work a matter of popular knowledge. The late Mr. Saxton for example, who, while in charge of the Standard Department, at Washington, invented and constructed apparatus, that under most other circumstances would have rendered him famous, yet not one person in a hundred has ever heard of him.

For these and some other reasons it is thought that a brief lecture on the subject of Standards will have some interest, and in order to inspire confidence in what is said, it will be proper for me to remark that I spent many years in connection with the matter, and founded the first commercial manufacture of gauging implements in this country, and constructed or had constructed the first measuring machine adjusted accurately to the Imperial yard, and the U. S. Standard, at Washington, I mean a machine for mechanical purposes.

My lecture will be divided into three parts, the first relating to the economic value of Standards and their practical application; second, to the derivation of Standards now in use, and thirdly, to some implements and mechanism for determining and transmitting dimensions.

In respect to Standards for weight not much need be said, these are derived from Lineal measure, so also is Dry and Liquid measures.

It is easy to understand that when a lineal or length Standard is once assumed, it is not difficult to measure a specific quantity of some material, water for example, and call it a pound or a gallon. The gravity of distilled water is quite the same in all parts of the world, temperature being taken into account. If the gallon or pound were lost they could soon be restored with great precision by means of an uniform lineal Standard, if such a one existed.

Lineal or length Standards are, therefore, the basis of all, and to these mainly attention will be called this evening. In a consecutive treatment of the subject the derivation of National Standards should come first, but, as the whole subject may be new to some present, and part of it to all, the object of the lecture, it is thought, will be best served by first treating of the economic value of Standards and implements for exact measurement.

The usual limit of accuracy in implements employed in common machine fitting is one ten-thousandth of an inch. English makers claim more for gauges made in that country, but my own experiments have led me to believe this limit close enough. In this country there are three grades of precision employed, one five-thousandth, one ten-thousandth and one twenty-thousandth of an inch. The implements present correspond to these grades. The test rods covered with wood are within a limit of one twenty-thousandth of an inch at 70° of temperature. This, to many, or, indeed, almost every one, will seem a needless refinement but it is not so. So far from it, that there is every day fitting done in the machine shops of this city that comes within a limit of one ten-thousandth of an inch—not measured and determined by implements, but by trial fitting.

In common fitting, even on the coarser kinds of work, one-thousandth of an inch will spoil a fit. The difference, one ten-thousandth of an inch, will cause a steel pin to fit firmly in a hole or permit it to drop out loose.

In making gauging implements, such as you see here, the one ten-thousandth of an inch becomes a tangible quantity, and is dealt with the same as eighths or thirty-seconds of an inch.

In making such implements, the work, after trial, is always marked with chalk, 1, 2, 3, and so on, these figures meaning one ten-thousandth of an inch. The workmen deal with these sizes with the same confidence and facility they would with one one-hundredth of an inch in the coarser kinds of work.

Watches, firearms, sewing machines and other articles of the kind, are made with dimensions that come within a one ten-thousandth limit, not on all parts, but in moving joints when duplicated parts are employed.

Sight, unaided by glasses, fails long before such limits are reached, but touch does not. A workman will, and does, continually set calipers to one ten-thousandth, and there is no one present who would not at once detect a difference much less than that between the implements of the kind I hold in my hand.

When the ordinary mechanical processes in metal fitting involve such exactness, it is easy to understand the importance of precision in National Standards or in the fine class of implements such as are used for reference.

I am at much loss to present this subject of exact dimensions in such a light as its practical importance demands, and I must claim a little on behalf of your imagination. The subject is technical, yet I think can be grasped even by those who have not previously given attention to the matter.

Modern manufactures may be said to rest upon the division of labor. This term is employed to describe that state of things where one person learns a particular trade or calling in distinction to a barbarous state, where each person attempts to supply all his wants by his own efforts.

The principle reaches back to the very beginning of civilization, and is indeed the measure of what we may call industrial civilization and progress.

In a barbarous state there is no division of labor; there are no carpenters, farmers or tailors. Each person attempts to construct his own hut, procure his own food and raiment; but production in the usual sense of that term, cannot begin until there is a division of labor and people follow special callings.

Further on these callings are subdivided into branches, and the subdivision of labor goes on until the highest skill may be concentrated in some small thing, the tempering of steel, for example, or the production of minute screws or parts of machines.

Keeping in view this first proposition that our skilled manufactures rest upon a division of labor, I now add a second one, which will bring us nearer to standard sizes, namely: That, in most of our manufactures, the division of labor depends upon a duplication of parts, making two or more things precisely alike.

In this country, about 20 years ago, we were able to begin the manufacture of watches, employing the dearest labor in the world in competition with the cheapest of Europe, that could be called skilled. The difference between Boston and Geneva was more than as three to one in favor of the latter.

The reason generally given for this bold venture and its success is that "machinery was employed," and that reason was correct in so far as the modes of operating, but behind the machinery and qualifying nearly all advantages that could be gained by it, was the more important matter of duplication, making the parts of watches uniform and interchangeable. That was the main secret, the "principle," so to call it, on which the whole matter rested.

Machinery produces duplicates, hand labor can not, and because duplication was possible the division of labor could be made complete. To this principle of duplication we can ascribe our success in many manufactures, and perhaps the whole success we have had in competing with Europe in the finer kinds of metal work. Standards and gauging implements permit a duplication of parts, and this brings us to the connection with industry.

All who have read Adam Smith's "Wealth of Nations" will remember his description of pin making—how a man who cut off the wire, formed the points, made the heads and put them on could make only a few dozen pins in a day, but, in a factory, where different persons cut the wire, pointed it, made the heads and riveted them on the product was increased twenty fold. This was nearly 100 years ago. The division of labor has gone on, the duplication of parts succeeded, and now the cost of making a thousand pins is no more than it was to make a score when the "Wealth of Nations" was written.

It is evident that if the parts of any article are to be made by different persons such parts must be made to some common gauge or standard so they will fit together, otherwise each person would have to himself complete an article, fitting together by trial the different parts, and he would be wholly unable to make two articles precisely alike. Nearly all kinds of work are done by some Standard that permits duplication. A carpenter may make a table and have all of its component parts ready to be joined together without trying or comparing any of them, or several workmen might make different parts of the same table with the assurance that all would fit together. To do this there would be employed a scale of lineal measure, called a rule. The dimensions of the parts would correspond to feet and inches, or, as we might say, to our National Standard of length.

In constructing works of metal, the same thing applies, with the difference that the material is hard and inelastic, and dimensions must be much more accurately dealt with.

As before remarked, sight fails long before the required precision is attained, and the sense of touch is resorted to. This applies to all parts that are closely fitted, and by the use of standard gauges or corresponding gauges, the different parts of a machine could be made in London, Philadelphia and San Francisco, and fit together the same as if prepared at one place.

The custom is to prepare drawings of the different parts of machinery, and mark on all the proper dimensions. Such dimensions are or ought to be from our National Standard, and if so, the parts can be made at different places and by different persons. Any number of workmen can, in this manner, be engaged on a particular work.

In all large works in the Eastern States, also in nearly all parts of Europe, the parts of machinery are made to Standard dimensions. In Great Britain and a few of the northern European countries to feet and inches, but in the south of Europe and most continental countries to the Metrical Standard.

The value of machinery, or similar work, is unquestionably affected by the fact of its being so fitted. I am not aware of how much effect this would have, but do know that specifications for machine work commonly specify Standard dimensions, and when not specified, contracts are understood to call for that as an obvious condition.

No one fully aware of the true importance of the matter would care to purchase machinery or other work made to special dimensions or irregular dimensions. No part could be replaced except by trial fitting, and repairing would be very expensive.

[To be Continued.]

Uncalled for Money.—About $10,000,000 are now lying idle in the U. S. Treasury at Washington for the redemption of matured bonds on which interest ceased at various dates from before Jan 1, 1867, to July 1, 1881. There is also an amount of some $12,000,000 or more of United States fractional currency not yet presented for redemption. The probability is that but little, if any, of this large amount will ever be called for. It will eventually go to the benefit of the Government. The great bulk of the paper evidences of this indebtedness, has most probably been either lost at sea or burned up on land. No inconsiderable quantity of the last amount is held by individuals as a curiosity and memento of other days—it being worth more for such purpose than for its face value in coin.

The Public Lands.

We stand a fair chance now to get some authoritative information concerning the whereabouts of public land still available to entry, and to have it surveyed, mapped, etc., so that the selector need not work to so great disadvantage in the tiresome hunting which he has had heretofore to practice. The surveying, etc., of our government lands is to be urged upon Congress at the coming session and the appropriation of money to secure the work is to be asked for. The present movement to secure this is being undertaken under the auspices of the Board of Trade of this city, which seems to be awakening to the need of doing something to induce desirable immigration, and is holding meetings for the discussion of the best means of securing it. As a preliminary step toward rendering our public lands more available, a communication was addressed to Theodore Wagner, U. S. Surveyor-General for California, and a reply was received which embodied the following statements:

The area of the State of California, as estimated by this office, is 100,500,000 acres. The area of surveyed agricultural and mineral land is 58,828,207 acres, and of unsurveyed agricultural and mineral land 29,237,000 acres, making the aggregate area of the public lands 80,065,267 acres, leaving an area of 12,434,733 acres, divided as follows:

	Acres.
Private or Mexican grants	3,758,151
Indian and military reservations	318,631
Swamp and overflowed lands	1,720,751
Lakes, bays, navigable rivers, salt marsh and tide lands	1,637,200
Total	12,434,733

The surveyed lands embrace all the large plains and main valleys of the State, as well as the greater portion of the high table lands in the Sierra adapted for the grazing of large herds of cattle and sheep. They also embrace a large portion of the two timbered mountain regions—the Redwood belt, extending from the Bay of Monterey northwesterly to the Oregon line, for a distance of about 350 miles, and from the sea coast easterly toward the Coast Range mountains, with a general width of 30 miles, and the other covering with valuable timber of pine, fir and spruce the slopes of the Sierra Nevada, between Mt. Shasta on the north, and the junction of the Sierra Nevada with the Coast range on the south, for a distance of about 500 miles in length, with an average width of 50 miles. Both of these mountain regions, as well as the other surveyed portions of the Coast range running southeasterly from the Bay of Monterey to the south boundary of the State, are sufficiently watered, and contain many small fertile valleys and sunny and grassy hillsides and oak openings, well adapted for the raising of all kinds of California fruits and vegetables and offering cheap and comfortable homes for industrious farmers.

The unsurveyed lands chiefly embrace portions of Del Norte, Siskiyou, Humboldt, Trinity and Shasta counties in the northwestern; of Modoc, Lassen and Plumas counties in the northeastern; of Placer, El Dorado, Alpine, Tuolumne, Mariposa, Fresno, Tulare and Kern counties in the central; and of Mono, Inyo and San Bernardino counties in the eastern part of the State; also of Santa Clara, Stanislaus, San Benito, Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles and San Diego counties on both slopes of the Coast range of mountains.

The unsurveyed lands, although in the main rough and mountainous, contain many fine spots for homesteads, treasures in water power for mill sites, in valuable timber and in precious metals, the development of which would furnish homes and occupation for a large population. For this reason these lands should be speedily subdivided. I cannot, however, tell when it will be done, as it depends altogether upon the yearly appropriations made by Congress for the surveying service.

It is quite true, as has been often stated, that the best portions of the public domain have passed into private ownership under the different ways of taking up land which have been provided by law; but there are, no doubt, tracts of comparatively small area still available, and should be turned to agricultural account. The Board of Trade is endeavoring to obtain from the local land officers through the State, general statements of the land still open in their several districts. The first report received is from J. C. Bradley, Register at the Marysville office, and it is as follows:

There are nearly 1,200,000 acres surveyed and unsurveyed government lands in this district not yet disposed of. These unsold lands are all or nearly all, foothill and mountain land, and a greater part thereof so mountainous and broken as to render them unfit for cultivation or settlement. They are not confined to any particular locality, but are scattered all around, each county in the district containing more or less. There is no place or locality containing any quantity of unsold land suitable for settlement that I could at present call your attention to, the valley lands having all been disposed of some time ago. It is true that there are large quantities of foothill land in the counties of Nevada, Yuba and Butte, now considered almost valueless, which, in course of time, may become valuable for orchard and vineyard purposes, but until cheap means for irrigating these lands can be devised and carried into effect, it will be useless to send immigrants thither with the expectation of being able to make a living and build up homes for themselves and families. In the southwestern portion of Plumas county, not far distant from the town of Quincy, lies the largest body of unsold land now in this district, and it is possible that this section of country could absorb a larger population than there is now, but the altitude is so great, and the winters consequently so long, that farming or stock raising cannot be made as profitable as in places nearer the valley. There is a range of mountain and foothill land running up through the eastern portions of Napa and Lake counties and the western parts of Yolo, Colusa and Tehama counties, some of which is yet unsurveyed, where I think the attention of parties desiring to make new homes might be directed. In this mountain range no one need expect to find any large amount of arable land; but there are many little valleys scattered among the mountains where parties wishing to go into the stock-raising business might profitably locate.

The Marysville district is one which has been prominently before the public since the early days, and has been run over by hosts of miners and locators. It is natural to expect that less land would be left in such a region than in some of the newer districts, and this the reports, which may be expected from the Registers therein, will show. We shall give our readers all information on this subject which can be obtained, for aside from the openings for immigrants there are many of our own people who would like to get more room for their orchard and vineyard enterprises; and they are prepared to turn good land to quick account whenever they get a hint of where it may be found.

END SPLITTING.—Logs and planks split at the ends because the exposed surface dries faster than the inside. Saturate muriatic acid with lime, and apply to the ends like whitewash. The chloride of calcium formed, attracts moisture from the air and prevents the splitting.

"THE $1,000 CHALLENGE"

Ore Feeder for Quartz Mills.

OVER 800 ARE NOW IN USE, GIVING ENTIRE SATISFACTION.

Awarded First Premium at the Tenth and Twelfth Industrial Fairs of the Mechanics' Institute.

Twenty Per Cent. More Ore Crushed with Fifteen Per Cent. Less Wear of Iron than by Hand Feeding.

The accompanying cut illustrates the recently introduced Grip, and also the Spring Attachment, which replaces the Weight heretofore used, and which are obvious improvements.

It is now fully demonstrated, after careful and long continued experimentation and practical use, that the plan upon which a perfect Ore Feeder must be constructed is that of a carrier, and not that of a shaking-table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Jerky or spasmodic contrivances will not answer the purpose for wet or sticky ores.

The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20	Stamp	Tuolumne county,	Cal.
Sheep-Ranch	20	"	Calaveras "	"
Mahoney	40	"	Amador "	"
Zelle	40	"	" "	"
Placerville	40	"	El Dorado "	"
Gross	80	"	" "	"
Julian	20	"	Placer "	"
St. Patrick	15	"	" "	"
Providence	20	"	Nevada "	"
Omaha	10	"	" "	"
Green Mountain	60	"	Plumas "	"
Plumas-Eureka	60	"	" "	"
Bulwer-Standard	30	"	Bodie Dis., Mono,	"
Standard	20	"	" "	"
Noondsy	30	"	" "	"
Bodie	10	"	" "	"
Christy	5	"	Utah Co., Utah.	
Ontario	40	"	Parley's Park, "	
Contention	20	"	Tombstone Dis., Arizona	
Grand Central	20	"	" "	
Harshaw	20	"	Patagonia, "	
Sunshine	20	"	Idaho Springs, Col.	
Homestake	240	"	Black Hills, Dakota.	
Father De Smet	80	"	" "	
Hidden Treasure	40	"	" "	

Superiority of the "Challenge" Ore Feeder Demonstrated!

At the "Christy" Mill, Utah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "Eclipse."

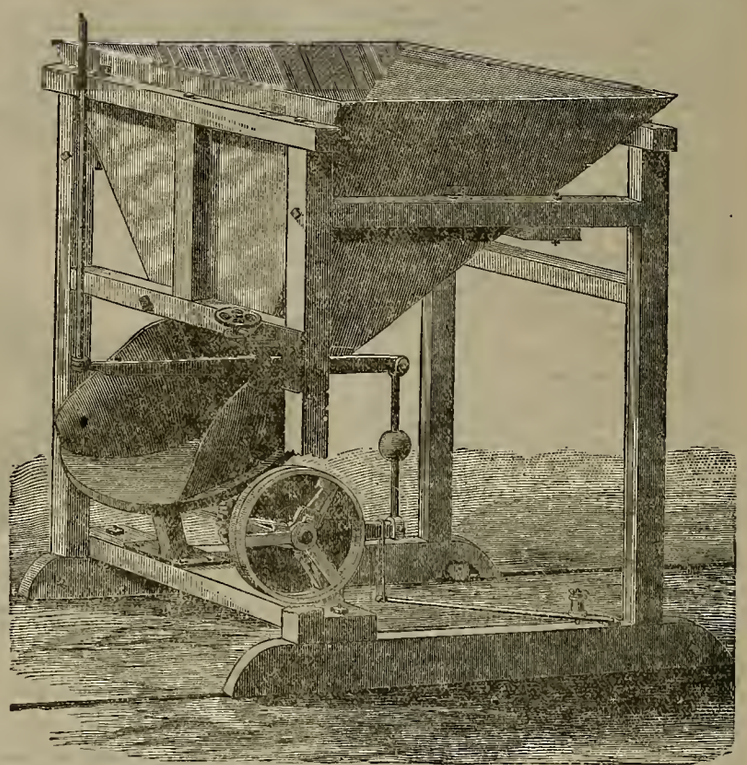
The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted.

The "Silver King," Mill of Arizona, also removed the "Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill, of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.



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[ESTABLISHED 1860.]

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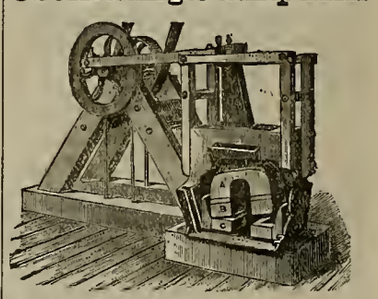

It has no Stems, Cams, or Tappets, and Adjusts Itself to the Wear of the Shoes and Dies.

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The office of the STETEFELDT FURNACE CO., having been removed to New York, parties wishing to obtain information in San Francisco about the Stetefeldt Furnace will apply to Messrs. Prescott, Soott & Co., Union Iron Works San Francisco. C. A. STETEFELDT.

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IT HAS BEEN FULLY PROVED AND TESTED.

It weighs complete, 7,000 pounds It costs $1,500 ready for the belt Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.

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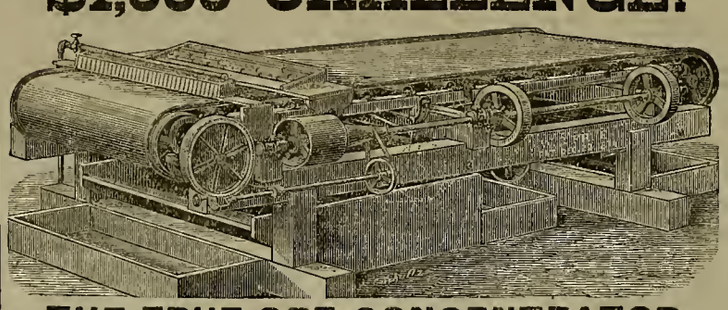

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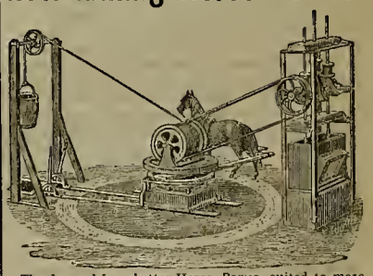
Daniel Meyer, Capitalist, S. F.
Prof. Thos. Price, M. E., S. F., Cal.

New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.

This power is light and strong, so that two or more horses can be used for crushing ore or other work.

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING SEPTEMBER 27, 1881.

247,479.—REMEDY FOR CURE OF SCAB IN SHEEP—Brittain, Rolley & McGeorge, Springville, Cal.

247,535.—AMALGAMATOR—N. D. Burlingham, Garden Valley, Cal.

247,545.—MUDRINO FOR BOILAR FURNACES—P. F. Dundon, S. F.

247,546.—FURNACE FOR STEAM BOILERS—P. F. Dundon, S. F.

247,663.—FAUCET—T. J. Loftus, Sacramento, Cal.

247,571.—RAILWAY BALLOON, ELECTRIC TRAMWAY AND TRUCK—C. F. McGlashan Santa Barbara, Cal.

9 885 (Reissue).—DAVICE FOR RAISING TAILINGS FROM MINES—W. A. Rogers, Folsom, Cal.

247,535.—GRINDING AND PULVARIZING APPARATUS—W. C. Stiles, Nevada City, Cal.

247,705.—STUMP EXTRACTOR—W. A. Stoddard, Dallas, Oregon.

247,709.—BUCKLE—Sweyea & Lowe, Walla Walla, W. T.

247,720.—HAIR TONIC—Caroline Weisser, Los Angeles, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

CENTRIFUGAL ORE CRUSHER AND PULVERIZER. Wm. L. Dawson, San Francisco, assignor of one-half to Isaac Stead. Patented Oct. 4, 1881. No. 247,749. This devise relates to certain improvements in that class of crushers or pulverizers in which a series of beaters is secured to a central revolving shaft, and inclosed within a stationary case provided with an opening or hopper into which the ore or other material to be pulverized is fed, so that it will be crushed by the rapidly revolving beaters and allowed to escape through suitable screens. An axle or central shaft is journaled upon the stand and revolved in an appropriate manner. Fitting around and attached to the central shaft is a drum, which has its body made of wood, the sides being protected by sheet iron plates, and the circumference provided with an iron band shrunk in so as to fit tightly. Beaters are fastened, and because of their rapid revolution there is immense centrifugal force generated which would tend to force them from their fastenings. The beaters are let through the iron band and driven into the drum in slots made for their reception. The shoes are so constructed that when they become worn they may be adjusted. About the central shaft and drum is formed casing in whatever sections may be found convenient to have access to the drum and beaters. The casing has two sides supported by the frame side and secured together by bracing rods. On the inside of the sides near the outer edges, grooves are formed in which transverse bars are placed, having their ends provided with a notch, in which is placed a small block. On these blocks placed in the notches of one bar, rests the next bar, flat side down, thus having openings between the bars, and when continued all around they form a circular screen within the outer casing and surrounding the drum, and within which the beaters revolve, crushing the ore and allowing it to pass off through the screen thus formed.

ROTARY CYLINDER FURNACE.—Geo. W. White, S. F. Patented Oct. 4, 1881. No. 248,000. The class of furnaces to which this invention relates, is that which consists of a hollow cylinder mounted upon suitable pulley-bearings in an inclined position; the fire-place or furnace being so placed that the heat and products of combustion are directed into and passed through the cylinder, while the ore is fed into its upper end, the rotation of the cylinder combined with certain projections on its interior causing the ore to travel toward its lower or discharge end, and at the same time the projections serving to alternately lift and drop the ore through the passing beat. The present improvements consist first of an arrangement for shifting the furnace to either inclination and feeding the ore in either direction; second, to the arrangement of parallel flues inside the cylinder around the main flue, which serve as connecting flues between the fire-place and chimney, and through which the heat and products of combustion are conveyed to the chimney, while the ore passes through the center or main flue and out of contact with the draft and products of combustion from the fire-place thus converting the furnace into a muffle, which adapts it for reducing that class of ores from which it is desired to expel metallic vapors and from which it is desired to exclude the products of combustion during the reducing process. By this construction the following advantages are gained: First, by tipping the furnace, ore may be fed through it, so as to pass, while being reduced, in the same direction that the heat passes, or in the opposite direction, as may be desired, and as may be best for the particular quality of ore being treated. Second, the fire and heat surrounds the main flue in which the ore is treated, and thereby furnishes a better heat with less fuel than can be obtained in rotary furnaces not so constructed. Third, the draft and products of combustion do not pass through the main flue or in contact with the ore.

LOCOMOTIVE.—John T. Davis, S. F. Patented Oct. 4, 1881. No. 247,802. This class of locomotives to which this invention relates is that in which the driving wheels act by rolling friction upon corresponding friction wheels secured to the same axles as the bearing wheels which run upon the track and which have a smaller diameter than said bearing wheels. It consists in a means for increasing the frictional contact between the drivers and the driven wheels, by means of hydraulic rams. The object being to acquire increased speed with less power, whereby economy of fuel and wear will result.

RAILWAY BALLOON AND ELECTRIC TRAMWAY AND TRUCK.—C. F. McGlashan, Santa Barbara. Dated Sept. 27, 1881. No. 247,571. This invention relates to a new tramway and truck, and, in connection therewith, it relates to certain modifications thereof, whereby results are produced which are all dependent upon the main invention. It consists in supporting wires, ropes, rods or rails above the ground by means of posts in such a manner that a peculiar truck may travel on said wire with safety. This traveling truck may be made to support a car and act as a running gear for it, or it may be utilized as a guide for a balloon. It may further be used as a means for connecting an electric circuit, whereby communication may be held with the car of a balloon or a moving train. The main feature is the tramway with its peculiar truck, but slight modifications are necessary in both to accomplish the desired results.

SMOKE CONSUMING FURNACE FOR STEAM BOILERS.—Patrick F. Dundon, S. F. Dated Sept. 27, 1881. No. 247,546. This is an improvement on the class of furnaces known as "smoke burners." It consists in the construction of a furnace having a bridge wall at its rear end, with the top so curved toward the furnace in combination with a blast of air or steam directed upon the surface of the fuel at an angle, so as to strike it near the bridge wall, whereby a counter-current will be induced, which will return the smoke, soot and unburned particles or gases toward the front of the furnace to be projected downward upon the incandescent fuel, where it is ignited and consumed before escaping over the bridge wall.

News in Brief.

THERE is danger of a water famine in New York City.

MICHAEL DAVITT, the imprisoned agitator, is soon to be released.

THE Mexican Government is about to colonize 200 Italian families.

A STATE Greenback camp-meeting is in progress at Jackson, Mich.

ANDREW NUNAN was killed by a fall in the Savage mine, Sunday.

THE Garfield fund has reached $339,898, and the Michigan fund $94,258.

REV. THOMAS HARRISON is striving to get up a revival in San Francisco.

AN Italian named Tanzi was shot by a night watchman at Sonora, Sunday last.

IN the Insane Asylum at Stockton, there are 786 male patients and 325 female.

A CIGAR factory employing 200 persons has been destroyed by fire in New York.

WASHOUTS are causing great trouble on the Atchison, Topeka and Santa Fe railroad.

DURING the past seven days 110 business failures have occurred throughout the country.

BANDON, Coos county, Oregon, people, make a good margin by selling their salmon at $10 a ton.

SOME large plate glass windows have been cracked in this city, by absorption of the sun's rays.

THE headquarters of the Russian Nihilists has been discovered, and 60 arrests have been made.

THE tobacco crop in the vicinity of Raleigh, N. C., is reported badly injured by the first frost.

CERTAIN Texas banks advertise to take all the Confederate bonds they can get at $2.50 per $1,000.

FEVER is epidemic in the Punjanb, Hindoostan, the deaths at Unnivisir averaging 200 to 300 daily.

AT Las Lunas, N. M., Friday night, three Mexican murderers were taken from jail by a mob and hanged.

IT is announced that it will require $1,000,000 to make good the losses caused by the Michigan forest fire.

A BOY named Floyd was thrown from a horse on the race track at Reno, Nev., and probably fatally injured.

BARON VON HAMERLE, Austro-Hungarian Minister of Foreign Affairs, died suddenly at Vienna, of heart disease.

THE overland stage from Oregon was robbed near Redding, Shasta county, Saturday night, by a solitary highwayman.

THE San Louis Rey *Star* suggests that a "quail cannery" be established there and the Eastern markets supplied.

A LATE severe frost has caused the Long Island farmers to hasten the gathering of their fall crops already badly injured.

The Mining and Scientific Press

Established May, 1860, this has long been the leading mining journal in America, and enjoys a large circulation among the more intelligent operators and workers in the gold fields of the world.

As a scientific and mechanical representative of the Pacific Coast, it is decidedly popular and a standard journal with the most thrifty industrial people of the Pacific States and Territories. Its authority is of the highest order, and its usefulness in its special sphere unrivaled.

Every public library, mining engineer, metallurgist, mining operator and intelligent mechanic and manufacturer will find profit by its reading.

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Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

O. W. MCGRAW—Santa Clara county.
M. F. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—San Mateo and Santa Clara counties.
C. E. WETMORE—Alameda county.

A Compliment.

SANTA BARBARA, Oct 9, 1881.

MESSRS. DEWEY & CO., PATENT AGENTS.—Gents: Patent received. Many thanks for your promptness and accuracy. Whatever work I may have in the future, shall be yours. Very Respectfully,
C. F. MCGLASHAN.

Attend to This.

Our subscribers will find the date they have paid to printed on this label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F.D., at this office.

PARSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We will send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry O. Hanks, State Mineralogist.

ANNUAL STATISTICIAN of 1881.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 816 California st. Price, $4.

San Francisco Metal Market.

[WHOLESALE.

WEDNESDAY, October 5, 1881.

IRON.—			
American, Pig, soft, ton	—	@	30 00
Scotch, Pig, ton	28 00	@	30 00
American White Pig, ton	—	@	—
Oregon Pig, ton	—	@	—
Clipper Gap, White	—	@	30 00
Clipper Gap Car Wheel	—	@	35 00
Refined Bar	4	@	7½
Horse Shoes, keg	—	@	5 50
Nail Rod	—	@	7½
Norway, according to thickness	6½	@	7½
STEEL.—			
English Cast, lb	14	@	18
Black Diamond, ordinary sizes	—	@	14
Drill	15	@	18
Flat Bar	14	@	15
Plow Steel	—	@	6½
COPPER.—			
Ingot	—	@	52
Sheet	32	@	35
Sheating, Tinned 14x18	36	@	41
Nails	—	@	—
Bolts	38	@	42
Old	—	@	18
Bar	—	@	22
Cement, 100 fine	—	@	15½
LEAD.—			
Pig	5	@	5½
Bar	—	@	6
Pipe	—	@	8
Sheet	—	@	9
Shot, discount 10% on 500 Bags			
Drop, per bag	—	@	2 10
Buck, "	—	@	2 30
Chilled "	—	@	2 50
TIN PLATES.—			
10x14 I C Charcoal	—	@	7 70
10x14 I C Coke	6 15	@	6 40
Banca Tin	—	@	25 00
Australian	—	@	30 00
I. C. Charcoal Roofing 14x20	—	@	6 90
ZINC.—			
By the Cask	—	@	9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	—	@	10
NAILS.—			
Assorted Sizes	4 00	@	4 25

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, October 12, 3 P. M.

SILVER, ½.

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DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

SAN FRANCISCO, OCTOBER, 1, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, dividend No. 83, of seventy-five cents (75 cents) per share, was declared, payable on Wednesday, October 12, 1881, at the office in this city, or at The Farmers' Loan and Trust Company in New York.

WM. WILLIS, Sec'y,
Office—Room No. 29, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

REGULAR DIVIDEND NOTICE.

OFFICE OF

Northern Belle Mill and Mining Company,

SAN FRANCISCO, CAL., OCTOBER 10, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 54), of fifty cents (50 cents) per share, was declared, payable on Saturday, October 15, 1881. Transfer books closed on Tuesday, October 11, 1881, at 3 o'clock P. M.

WM. WILLIS, Sec'y.

Office—Room No. 29 Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF

Northern Belle Mill and Mining Company

SAN FRANCISCO, CAL., OCTOBER 10, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, an extra dividend (No. 55), of twenty-five cents (25 cents) per share, was declared, payable on Saturday, October 15, 1881. Transfer books closed on Tuesday, October 11, 1881, at 3 o'clock, P. M.

WM. WILLIS, Sec'y.

Office—Room No. 29 Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company.

SAN FRANCISCO, OCTOBER 4, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 22) of twenty-five cents (25 cents) per share was declared, payable on Saturday, October 15, 1881, at the office of the Company, Room 19, No. 328 Montgomery St., San Francisco, California. Transfer books will be closed on October 10, 1881, at 3 P. M.

JOSEPH NASH, Sec'y.

The Oxford Beta Tunnel and Mining Company. Location of principal place of business, San Francisco, Cal. Location of works, Aurora, Esmeralda County, Nevada.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No 20) levied on the 20th, day of August, 1881, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. Shares.	Amt.
Richard A. Chase	25	50	$10.00
Moses C. Kyes	147	7	1.40
Moses C. Kyes	187	3	60
Dr. A. Farnsworth (unissued)	40	8.00	
F. Staehler	225	10	2.00
F. Staehler	235	10	2.00
Dr. B. S. Mason	239	35	7.00
Larkin Smith	251	50	10.00

And in accordance with law, and an order of the Board of Directors, made on the 20th day of August, 1881, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the Auction Rooms of Maurice Dore & Co., 410 Pine St., San Francisco, California, on Monday, the 17th day of October, 1881, at the hour of 10 o'clock, A. M., of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

GEO. H. PECK, Sec'y.

Office—Rooms of Dr. Knowles, 118 Dupont street, San Francisco, Cal.

Belcher Silver Mining Company. Location of principal place of business, San Francisco, California. Location of works, Gold Hill, Storey county, Nevada

Notice is hereby given, that at a meeting of the Board of Directors, held on the twenty-ninth (29) day of September, 1881, an assessment (No. 28) of one dollar ($1) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 8, No. 327 Pine street, (Stock Exchange Board Building), San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the first (1) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the twenty-fourth day of November, 1881, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors

JNO. CROCKETT, Sec'y.

Office—Room 8, No. 327 Pine St., (S. F. Stock and Exchange Board), San Francisco, California.

Newcastle Gold Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Yankee Hill Mining District, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Twenty-third (23) day of September, 1881, an assessment, (No 2) of two (2) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 33, No. 318 Pine St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the First (1) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Twenty-first (21) day of November, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

E. G. MATHEWS, Sec'y.

Office—Room 33, No. 318 Pine St. San Francisco, Cal.

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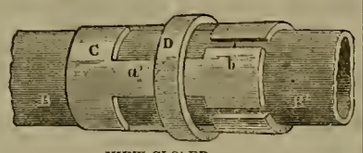

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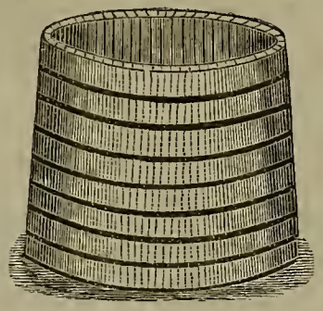

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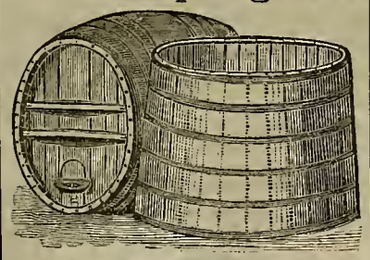

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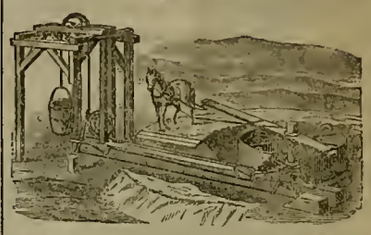

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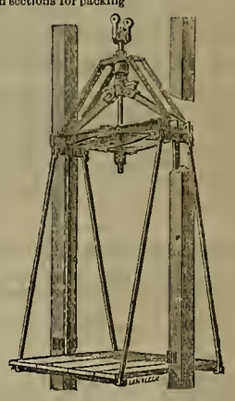

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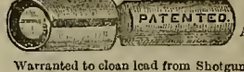

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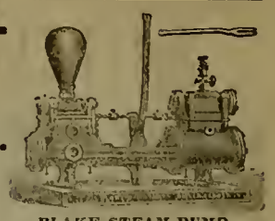

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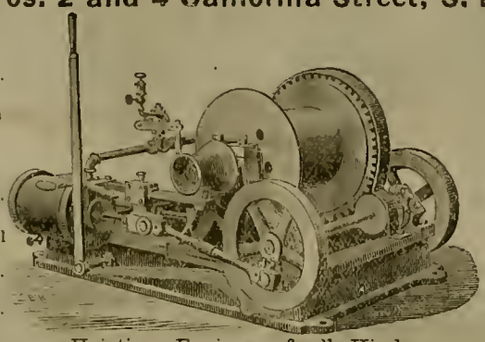

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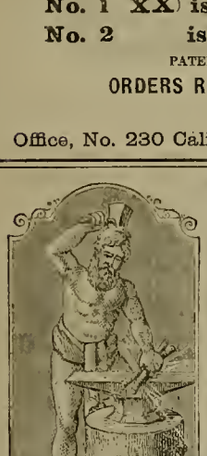

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BOTH PROCESSES ARE PERFORMED AT ONE OPERATION.

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An endless chain carrying conveyors or scrapers passes continuously through over both hearths, going one way through one chamber and the other through the other chamber. By this means the ore is fed and discharged at the same end of the furnace.

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The process is essentially the same as the well-known Freiberg process; but the mechanical devices applied to the furnace and the peculiarity of its construction enable the inventor to thoroughly desulphurize and chloridize the ore to a higher percentage than other furnaces, and with less cost for fuel and labor.

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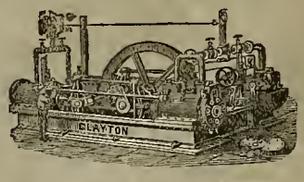

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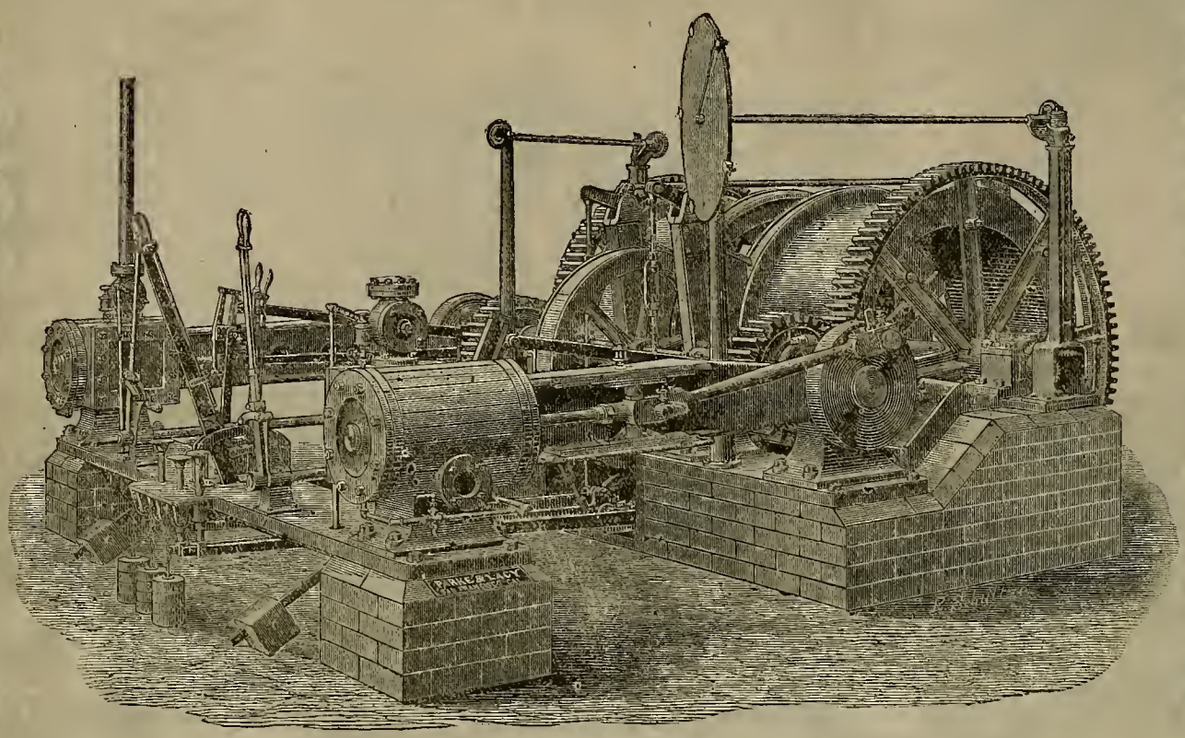

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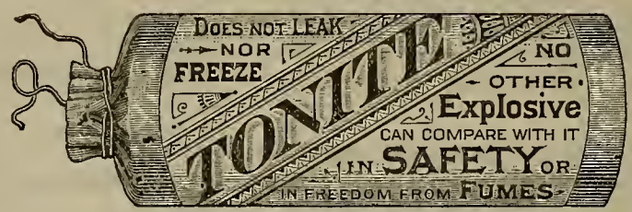

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, OCTOBER 22, 1881.

VOLUME XLIII Number 17

Ore Roasting Furnace.

We give on this page an engraving of a furnace for roasting and reducing ores, invented by J. H. Morton, of Keyport, Monmouth county, N. J. Referring to the drawing, *A* represents the masonry of what may be an ordinary reverberatory furnace, and A^1 the stack. At or near the top of the stack provision is made for allowing the introduction of finely crushed ore through a controlling valve, *D*, in a hopper, *E*. The stack has great breadth, and has a series of inclined reverberatory hearths as shown. The gases, after passing through the inclined hearths or passages, are conducted downward from the top of the stack, and after passing over a greater or less distance over a water surface, which will absorb the dust and a portion of the gases, they may rise again by their lightness, or aided by a fan. The down passage for the gases is indicated by *I*, and the water surface by *J*. The gases will ultimately be discharged through a flue, *P*.

To operate the device the attendant opens and closes the valves, C^1 C^2, etc., as he proves by practice is best, according to the class of ore under treatment. The current of air drawn into the stack by suction at any one of the valves, C^1 C^2, by the draft, strikes upon the upper face of the reverberatory hearth opposite the valve, whence it is deflected upward through the ore.

The hearths have upper and lower faces, *d*, *d*,' arranged in the form of a triangle to prevent the loss of heat by keeping the flame constantly in direct contact with the descending ore, and also to prevent the formation of eddies in the air current which would be formed where straight inclined projecting pieces are arranged in the stack.

The theory is to supply the ores in a comminuted condition adapted to be quickly acted on, and to cause the granulated or fine particles to roll and otherwise tumble along. The current of hot products of combustion containing sulphurous gases is met at the last turn of the flue by a fresh current of air, causing an immediate combustion of all the sulphurous vapors, thereby generating an intense heat.

Further effects of such air currents are to deflect the current of flame downward upon the floor of the opposite hearth, and to aid in the oxidation of the ores. In other words, after the ore has passed the controlling valve, *D*' and entered the series of reverberatory hearths it is subjected to a desulphurizing and oxidizing current of ascending flame. It is exposed to this current on a succession of highly heated inclined surfaces, and under conditions of agitation or tumbling which is claimed to be highly favorable to the complete burning of the sulphur and the oxidation of the metal. By effecting the desulphurization and the oxidation in combination with the reverberatory furnace, a^x, below, the invention economizes heat and reduces labor. No fuel is required on the hearths a^1 a^2, etc., only the gases which are relatively waste from the reverberatory furnace, a^x. The high temperature attained by the ore in the process of roasting is not diffused and lost, but is made a preparatory heating—to be immediately succeeded by a more intense heating in the chamber, *M*.

This chamber, *M*, lying below the hearth of the reverberatory furnace, a^x, and communicating therewith by a narrow, but sufficient passage to allow all the material which comes down through the tortuous desulphurizing passages to be discharged into the chamber, *M*, at a high temperature. The object of the chamber, *M*, and its connections is to deoxidize or chloridize the ores.

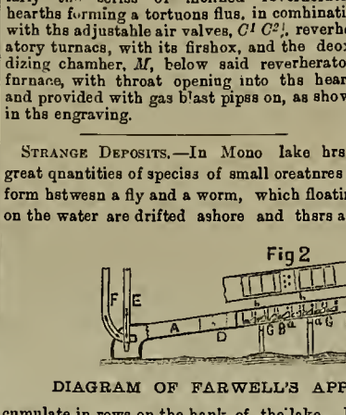
For the purpose of deoxidizing, the inventor provides a liberal supply of water gas, produced either by carrying steam through a mass of red hot charcoal, coke or coal. This gas is supplied at a high temperature through the passages, *m*, around the base of the chamber, *M*.

The water gas, or hydrogen, is presented at a high temperature to the ore in the absence of oxygen, except such as may be in the ore. The effect is to thoroughly exhaust the previously finely broken and desulphurized ore of its oxygen. The bottom opening, *b*', must be guarded to prevent access of air.

The inventor proposes in some cases, to introduce chlorine gas, as he thinks this gas will under these conditions be peculiarly useful in chloridizing ores. He says that ores containing gold and silver may be simply desulphurized and passed down into the lower chamber, where a stream of chlorine gas is allowed to act on them.

This inventor is of course aware that a series of reverberatory hearths forming a tortuous passage for ore, terminating at its lower end in a reverberatory passage, leading to a cupola below, connected near its lower end with a fire-box, has been used before. He claims particularly the series of inclined reverberatory hearths forming a tortuous flue, in combination with the adjustable air valves, C^1 C^2, reverberatory turnace, with its fire-box, and the deoxidizing chamber, *M*, below said reverberatory furnace, with throat opening into the hearth and provided with gas blast pipes on, as shown in the engraving.

Strange Deposits.—In Mono lake broad great quantities of species of small creatures in form between a fly and a worm, which floating on the water are drifted ashore and there accumulate in rows on the bank of the lake. In some places these worms have formed banks half a dozen feet thick; in fact, they have created immense deposits. This has been going on for ages, and by the aid of a powerful glass this curious formation can be distinguished two hundred feet from the present shore of the lake.



Furnace for Roasting Ores.

This goes to show that Mono was a very large body of water at one time. How many tons of worms have been carried away by Indians, and how many tons have been thrown up to become part of the natural soil, is hard to conjecture; they probably amount to some millions.

Portrait of Columbus.—A most remarkable and acceptable discovery was recently made in the Spanish Colonial Office at Madrid, of a portrait of Columbus, made when the great explorer was about 40 years of age. It represents him without any wrinkles on his broad forehead, with dark, thick hair, a brilliant eye and a beaked nose. The portrait is in perfect state of preservation, and the inscription is intact. It reads: "Columbus Lygur., novi orbis repertor." The size of the portrait is about 16x20 inches.

Assessment Work.

We are constantly in receipt of inquiries relative to the assessment work required on claims, and how long work will hold the claim from being subject to relocation. We have answered the question a number of times, but the following letter from the Commissioner of the General Land Office, dated Sept. 11, 1881, should be conclusive of the vexed question relative to assessment work when it expires and claims are subject to relocation:

> Department of the Interior,
> General Land Office,
> Washington, Sept. 12, 1881.
>
> Henry A. Bigelow, Esq., Prescott, A. T.:—Referring to your letter of July 30, 1881, I have to state that the act of Congress, approved January 22, 1880, provided that "the period within which the work required to be done annually on all unpatented mineral claims shall commence on the 1st day of January succeeding the date of location of such claim."
>
> Mining claims located on the 1st day of January, 1881, will not, therefore, be subject to relocation, by reason of non-performance of the required annual labor, until the 1st day of January, 1883. Very respectfully,
>
> N. C. McFarland, Commissioner.

A New Steamer for the Coal Trade.—The new iron steamship, *Walla Walla*, the seventh vessel built by John Roach & Sons for the Oregon Navigation Co., is now loading at New York, preparatory to her voyage thither, via Cape Horn. This steamship is 336 ft. in length and 5,000 tons displacement, built wholly of iron, in seven water-tight compartments. She is a first-class collier steamship, and will be employed in bringing coal from Puget sound to this city. She is also fitted up with a first-class cabin, and staterooms for about 30 passengers. She will take her place on the regular route with the two other colliers recently built, the *Willamette* and the *Umatilla*.

Their Idea of It.—A correspondent from the camp at Pueblo, Socorro county, New Mexico, thus describes one of the peculiarities of Eastern capitalists who visit New Mexico with an idea of buying a valuable mine for a very few dollars: "Several capitalists have visited our camp with a view of purchasing, but these gentlemen have an idea that the miner enjoys his rough fare, loves to encounter danger, and that he is working for the love of God, and are quite astonished when the proprietor will not part with a $5,000 lead for $300."

Shipments of Chrome.—A contract has been entered into between the managers of the chrome deposit in Del Norte county and the owners of the steamer *Hume*, whereby the latter is to bring to this city 1,000 tons of that material; about 70 tons of which have already been brought down. The full amount that the contract calls for will probably not be shipped before next spring.

The cost of working the copper mines of Lake Superior, Mich., varies from 11c to 23c per lb. of the ingots produced. The cost of the ingots from three of the mines for 1870 was as follows: Atlantic, 12.20; Central, 11.16; Quincy, 13.71. This is the best that either of these mines has done. Last year the Central's copper cost 11.85 to produce.

The Deadwood *Times* says the mica mines near Custer promise to be a great source of wealth to the country.

Apparatus for Hydraulic Mining.

We give on this page a diagram of an apparatus for hydraulic mining, invented by Wm. B. Farwell, of New York City. This invention relates to that class of mining where the deposits of sand, gravel or other material containing gold or silver, lies in low or level places, and where it is necessary to lift the mass of matter with which the gold or silver is mixed, and wash and carry the debris away to some other locality.

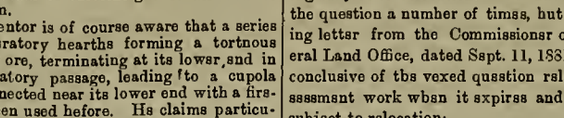


Diagram of Farwell's Apparatus for Hydraulic Mining.

In the diagram, *A* is a sluice pipe, made preferably of cast iron, and having a curved elbow at its end, opening downward and resting on the ground, where operations are to be carried on. *BB* is the ascending sluice or riffle box, and *CC* the connecting descending one. *D* is a flexible joint, made of strong canvas or other material, by which the sluice pipe, *A*, is connected with the box, *B*. This joint enables the sluice pipe, *A*, to be swung around in various positions, so as to operate over a wide surface of ground. To enhance its utility in this direction this sluice pipe may be made telescopic, if found to be desirable. *E* is the vertical pipe through which the jet of water is forced, which digs up the ground on which the open end of the sluice pipe rests, and *F* is the pipe through which the force-jet of water flows up along the ascending sluice box, carrying with it the loose gravel and the other matter dug up by the jet from the pipe, *E*. *G G* are the riffles in the ascending sluice box, showing the quicksilver lying in front of them, as at *a a*; and *b b* are the hanging spike or pin detents. *H H* are the riffles in the descending sluice box, with the hanging spike or pin, *c c*, above them. *I* is a second force-jet pipe for forcing the gravel, water, etc., up through the second ascending riffle box as fast as delivered from the descending riffle box, which arrangement may, as has already been remarked, be continued on to any required distance. The riffle boxes are supported on trestles, or in any other way that may be found economical and practicable.

It is obvious that the force water jets may be supplied by steam power or by the ordinary method of a fall from a sufficient hight to make them effective.

The inventor says he prefers to arrange the sluice at a considerable inclination, so that gravitation and the force of the current shall be in a considerable degree opposed to each other, in order that the particles of gold may all find their way to the riffles before reaching the end of the sluice. It is obvious, however, that any inclination of the sluice, however light, or even a horizontal arrangement of it, when used in connection with a forced jet of water, would secure in a beneficial degree the advantages above referred to, as the force of gravity would tend to retard rather than to hasten the passage of particles of gold through the sluice.

The first ascending sluice box may be supplied with gravel, sand, etc., containing gold, by means of a hopper, into which the material can be dumped or shoveled, as may be desired, without the intermediation of the digging jet-pipe, *E*, a single force-jet pipe, *F*, being in such case only required to carry the matter thus fed into the sluice box up over the riffles, as already described. This hopper may also be provided with a screen to prevent stones or other matter from getting into the riffle box.

The Leadville *Chronicle* says that a stop should be put to the prevailing custom of naming new mines after old ones. The habit leads to confusion, and in some cases proves a source of fraud. Several parties narrowly escaped being swindled into buying or lending money on Morning Star stock last year—the stock having no connection with the well-known Morning Star, but representing some unknown prospect at Ten Mile. Surely there are new names enough to be thought of without falling back on the old ones.

Big Bar.—The Christy Company recently shipped a bar of bullion valued at $2,799—the largest yet sent from Silver Reef District, Utah.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Butte Mountain.

Steady and Rapid Growth.

EDITORS PRESS:—This is probahly the most hnstling, overcrowded place in all the mining regions of the West. There is too mnch to be done for the money and the means at hand for doing it; too much husiness for the limited facilities we enjoy. The town now containing some 8,000 people, is a perfect jam, and more coming all the while, and this, with winter approaching, when they ought to stay away, aud when some already here will have to leave, for with lumher scarce, and supplies limited all cannot expect to get employment here during the winter. We have not hotels to accommodate, nor restaurants to feed the transient population.

Prevailing High Prices.

Merchandise, real estate and everything else here is dear. Wages of labor are also high—$3 to $4 per day. Prices are, in fact, too high to last, though not too high for present condition of things—all being alike, inflated. But these are matters that time and the railroad will regulate, for the now isolated sitnation of Butte has a good deal to do with causing and keeping up high prices. Value of bullion now being shipped from this town is $50,000 per week, and within a year will probably be three or four times tbat amount.

The Mines.

Thie rapid growth of Butte is, of course, all dne to the mines in the neighborhood of which there are many, some of great known value. I will not say as many do, that we have here the largest mines in the world nor the hest, nor will I affirm that they will rival the Comstock in production. But this may be safely said, that for the work done upon them, these mines make the hest showing of ore and give better signs of permanence than any yet developed west of the Rocky mountains. Whether larger or smaller, bettor or worse than the Comstock, these mines will have a very different history from that of the claims along the great Washoe lode. There may be gambling in stocks of theso Butte mines, but if so, there will always be bullion production and profits and that without many assessments, for after the lodes here are once opened and provided with plant, they will he self-sustaining at least, and not be constantly asking share holders to go down into their pockets to keep the life in them.

To simply name all the promising properties in this district would more than fill a column of the PRESS. Standing high up on the list of merits, are the following: First,

The Alice,

Which, so far as bullion goes, ie the leading mine in these parts, though not therefore necessarily the beet. This mine has now been opened by main shaft to a depth of over 700 ft., and hy levels run off from it every 100 ft. On most of these levels stoping is being carried on; only as much ore is being taken out, however, as the mill can handle. The quantity that conld he extracted without extra effort might be doubled if there were here meane for reducing it. The weekly product of the mine amounts to something like $30,000; monthly dividends, $40,000; total dividends dishureed to date, say, $200,000. That it can keep up this rate of production for years is here generally helieved.

Next among onr big or at least most prominent mines is the

Moulton,

On which a magnificent, first-class 40-stamp mill has just been completed and is now ready to commence running, only awaiting the finishing of the ditch for bringing in water, now nearly done. The steam hoisting works are also very complete, with lifting capacity to go down and drain the mine for 1,000 ft., or more. The main shaft having three compartments, ie now down over 500 it.; sinking, temporarily snspended, will be resumed as soon as the big pumps, now on the ground, are in place. Levels from this shaft are heing carried off every 100 ft. Every part of the mine is in the best possihle condition, and splendid ore bodies are being opened np. The work throughout is, in all respects, first-class, attesting the superior skill and good judgment of Prof. J. E. Clayton, the company's consulting engineer. This compsny, in a bnsiness point of view, is made up of exceptioually good material, the directory comprising some of the most solid men in the country.

The Belle of Butte

Is another mine that ranks high, in expectation at least, among our foremost claims. It is a live property, heing more than self-supporting even in its incipient stages of development. It has yielded high-grade ores from the start, and growe daily hetter under active working. It showe unmistakable eigns of permanency, and is held at a pretty high figure.

A Great Enterprise

Has jnst been consummated here, in the consolidation of a series of valuable claims, known as the Burnett, the Mountain and the Buffalo, formerly owned by different parties, hut eo situated that they reqnired to be exploited hy one set of works, and, therefore, to he reduced to a single ownership; an end that, after some delay and much negotiation, has at last been effected, to the great benefit of all concerned.

The company, owning a property of gigantic magnitude, and heing financislly etrong, will at once proceed to develop the same in an effective and systematic manner by means of a three-compartment shaft to he carried to the deep. In the spring a 40-stamp mill will be erected, should developments in the meantime result as expected.

Waiting for the Railroad.

Among other prominent mines here, fnrther notice of which will have to he postponed to another writing, is the Lexington Acquisition, Bell, Wahash, Morning Star, Stevens, etc., on all of which, besides many others, a grsat deal of exploratory work has been done, all exhihiting more or less good ore.

The citizens of this town and district are just now heing exercised over the question of having a railroad brought into the town. The Utah and Northern company propose to extend their road to Bntte, provided the people here will assist them to the extent of securing them right of way, station sites, etc., an object which our citizens are now considering, and which they will no doubt be ahle to carry out. Should they do so, our town will be connected with the outside world by the iron rail within the next six or eight months, securing to it and the adjacent mines many much needed and lasting advantages. NEW MONTANA.

October 5, 1881.

Bishop's Creek.

EDITORS PRESS:—Bishop's Creek is no longer the qniet farming town of former days. Its transformation has been gradual and complete. No longer do we hear at the store or the black smith's shop the price of live stock, of farm produce or agricultnral implements, discussed; hut the constant theme of conversation is the mines; and like all new mining camps, thero are among its denizens some enthusiastic creatures, who imagine that there is a fortune awaiting each and every one who may choose to take hold and develop a mine. But theirs is not an experience of long etanding; nor do many of that class "practice what they preach." They prefer to sit heneath the shade trees of town to making an honest effort toward building up a mining district.

However, there is a large number of good, practical miners, sober and industrious, who are scattered over the two mining districts, and who are slowly hut surely proving the mines of Owen's river to be something more than an illusion.

Such has been the influx of prospectors and the extent of their discoveries that at present there is a succession of camps on all the creeks and springs along the western hase of the White mountains for a distance of 20 miles, and reaching far back toward the summit.

Many of these prospectors have hut recently commenced work on these mines, while a few have reached a depth of from 30 to 70 ft. Several honded properties have reached a greater depth, and the Pajaro, now called by its incorporate name, the Poleta, has reached a depth of over 250 ft., and in no instance have I heard of the hottom being found, or a bad report given, and usually an increase in the value of the ore.

Several croppings in the vicinity of the Poleta were located, that gave no trace of gold on the surface, but at a snort distance from the surface carried an ahundance, and now are good mines, the ore assaying from $40 to $75 per ton.

A numher of mining experts have paid the districts a visit, and have invariably pronounced the outlook good, and this giving expression to a favorable opinion shows that the prejndice once existing against the mines of Owen's River, is wearing away. It cannot he many months before a mill will he erected for crushing the Poleta ore, and when that is accomplished, others will soon follow snit.

Several arastras have been running during the summer in the vicinity of the Poleta mine, and one also has been huilt in the Piute district, to work ore from the Mountain Chief, a free gold ledge discovered last June.

A town has also been laid out near the Poleta mine, given the name of Story City. Ten or 12 buildings have heen erected, among the numher a store and two ealoons.

It has been proposed, and I helieve the project is now under way, for a line of telegraph to extend from Bodie, through Owen'e valley, to Lone Pine. If this is carried ont, other improvements will soon follow.

Thus the wheels of progress are moving slowly forward, and Owen's valley may yet overflow with a population whose enterprise, hoth mining and agricultural, ehall stand second to none on the cosst. CONCORD.

Bishop's Creek, October 2, 1881.

THE Ogden *Pilot* relates this: J. Childs, better known ae Caribon, after whom the Carihou mountains were named, died at Soda springs last Saturday from the effects of a tussle with a hrown bear at Idsho Bar, Oneida county, Idsho. Carihou, who was a noted hunter and prospector, fired at and seriously wounded the hear, and with a companion plunged into the brush after his victim. The first thing Caribou's companion knew, the hear had the best of the eituation. Carihou wae literally torn to piecee before the bear was killed.

Silver District, Arizona.

From a lengthy article in the Arizons *Sentinel* we extract the following facts concerning this district:

There is positively not one ledge in thie district running athwart the conntry formation. The ore channels are four in number, viz.: The Silent channel, which is the extreme west and nearest the river, from which it is distant four miles; the Princess channel, one mile easterly; the Long, or Nine-mile channel, to the east one-half mile; and the New York channel, extreme east, distant one-half mile, a grand average over all of two miles. And this system, hear in mind, has a regular and parallel trend northwesterly and southeasterly, accompanied by huge granite mountain ranges, which form the foot-walls; and the low country hetween these huge dykes, and separating them, is of porphyry and oonstitute the hanging walls. The croppings of a volcanic trap, overlying the ledges, is of the most massive character, heing in width from 20 ft. to 200 ft., and looming up in many instances 160 ft. in height. The Nine-mile chsnnel has an unbroken hody of hnge croppinge for nine miles in length; and with a few breake (but not one blind lode), bae 32 locations on this one channel.

Now no miner will gainsay the proposition tbat I hold to, that we possess in these contact ledges, with their regular trend, parallel system and massive croppings, undoubted and true fissure-veins. And the character of the vein stuff, according to gcological lore and practical demonstration, is, heyond cavil, silver-hearing and favorable to metal at any attainable depth, consisting as it does of quartz, heavy-spar, calc-spar and fluor-spar and occasional hematite seams of ore—notably on the Klara. The greatest depth yet attained on the vertical shaft of the Silent n ine shows improvement in quantity and quality of ore in descent. No cribbing nor timhcrings are needed in development, and not a drop of mo sture is encountered at present depth, thus doing away with the expense attending a wet mine. The ore gencrally found is argentiferous galena, grey and whits carhonates, eilver glance-black sulphurets and and chlorides, about two-thirds milling ore, the remainder smelting variety. This will suffice for the ledges. In our avsilahility we are the peer of any mining camp in the Territory. The Colorado, a navigahle river, is from the district a distance of from four to eight miles. From the landings to many of the mines are good wagon-roads with easy grade, and at nominal coet can be exteuded to the others. The Territorial wagon-road now traverses the district longitndinally, thus bringing into notice eome of the most promising prospects in North Silver district, principally the Rooster, Clip, Alberta, Trne Fissure, Georgia, Marianna, City of Chicago, Joeephine, Waco, M. T. Orr, Silver Brick, Great Eastern, Great Expectatione and many others.

Tri-weekly stages run the 45 miles to Ynma, and there is also kept constantly on the road a fast freight teani, which, in connection with the regular monthly trip of the steamers on the Colorado river, give yon every facility of receiving freight and shipping ore or bullion. Telephonic communication will be had with Yuma as soon as the husiness justifies it. A eurvey has besn made, and in 30 days a narrow-guage railroad can he, and when necessary will be, huilt for transporting ore to the furnace and mills at the river and delivering water at a nominal cost. We are now paying one dollar psr barrel, with the exception of the Chicago Company, who have an exhaustless supply in a huge tank or natnral reservoir at their camp in East Silver District, annusl rains heing sufficient. Wood is abundant, delivered at the river for $3.50 per cord; wages for first class miners, $3.50 per day.

Legitimate mining is the rnle in the camp. Within the past year two large sales have heen made: The Silent mine to the R. C. G. and S. M. Co. for $100,000; the Hughes group, Black Rock, Pacific and Blue Rock mineet oa Boeton company, represented by Franklin J. Clark, for $175,000, both spot cash sales; two-thirds interest in the Silver Glance mine for $10,000; the Mandeville mine for $50,000; and it is rnmored the Clip mine will soon go at $50,000. Other sales are on the tapis. Rich strikes have heen made in the Black Rock and Pacific, the Silent, Silver Glance, Melissa, Rover, Rooster, Clip, Nellie Kenyon, Princess, Emma, Klara, Engineer, Remnant, Mamie, Iron Cap, Medora and Missouri.

LOOKING UP.—The mining outlook in all sections of our county is very encouraging at this time. From every mining camp around us comes news of the most encouraging nature. Ward, which for the past two years has heen nnder a heavy cloud, promises at an early day to again resume bullion ehipments on a permanent scale. Taylor district has already wheeled into line, and last Monday shipped its first bar. It bids fair to keep on shipping the shining metal for months to come. Silver Canyon and our own district are regular ehippere of the precious metals. Egan Canyon is getting ready to join in the chorus of the etamps and in about two months will be ready to join her sister camps in shipping bullion. White Pine, we regret to note, is the only district in our county that does not to-day show improved signs of prosperity in a mining point of view. With this solitary exception, there is a general movement for the better all along the line of the mining camps in White Pine conuty. We are pleased to note it.—*White Pine News.*

The Pioneer.

In a lecture delivered some time since by Thomss Fitch, he closed with the following glowing eulogy of the Pacific coast pioneer.

The gallant pioneer! He is tbe type of American fraternity, for be bas

> "Honor and courage;
> Qualities that eagle-plume men's souls
> And fit them for the sun."

He climbe like a huge fly upon tbe bald skull of some lofty mountain, and the primeval hills welcome his footsteps. He taps with the prospector'e pick at the adamantine doors of the earth's treasure chambers, and at his demand they reveal their shining secrets. His glittering ax lays low the green-plumed foreet monarchs, and on the emerald-hued prairies he marks the sitee of the cities yet to he. Not for him the science of the school; not for him the graces of culture; not for him the joys of home; not for him the sweet solaces of life. But he reade the story of the ages written on the rocks and hears the tale of mysterious forces whispered by the midnight stars; and the priest-robed mountains and the smiling lakes and white-lipped sunset seas are his kindred. Southward you shall behold him, undaunted by the roar of the Colorado, or and onward to listen to the wash of tropic waters. Northward his resolute face is turned toward the wooing mountains of crystal, until the north star gleams like a mighty diamond in its gold and crimson settings of northern lights, and the sudden snn hut for an instant hangs upon the verge of the polar night, a faint reminder of the lost southern clime, while the hooming artillery of the ice king hails the pioneer of polar seas. Westward—ah, there is no longer a west! The iron lace with which Progress fringes her garments reaches now to where the Golden Gate swings back upon her hinges. Asia and the Farther Indies are just beyond, and tbe Orient of Europe is the Occident of America.

And etill from the silver and the orange hlossoms of cactus-fringed aud snow-crowned Mexico, northward to where the icebergs glitter against an Arctic sky, our pioneers are marching and toiling. In the track which their fierce feet are breaking, our country is marching onward to her greatness. The army of civilization swells npon their pathway. Art, science, progress, the wealth of nations, the power and glory of the Republic follow. All honor and all hail to those brave hearts who lead the vanguard!

Tapping a Lake.

Eagle lake is located in Lassen county, Cal., 100 miles north of Rsno, and near the projected course of the Nevada and Oregon railroad. It is 30 miles long and 10 miles wide, and containe 116 square miles of water snrface. It hae no known outlet. Messrs. Marker and Merrill own the lake and many thousand acres of timher and farming land adjscent. They are now running a tunnel, which will be over 7,000 ft. long, to tap the waters of the lake at a point 12 ft. below its hed. The tunnel is now in 250 ft., and ie being pushed forward by two shifte of workmen. When the lake is reached the fall of water obtained will he used to run a sawmill and flume, which will be huilt from the mill to Belfast, 26 miles distant. The timber cut in the mill and cordwood will be floated down the flume, and its watere will further he utilized for irrigating the thousands of acres near Belfast, which need but their fertilizing touch to swell with an abundant harvest. The timber around the shores of the lake is mostly spruce, yellow pino and sugar pine. The trees are not as large in girth as those at the Truckee and Bigler woodlands, but are unusually tall and straight. The majority of the pine trees will yield four 16-foot logs hefore a limh is met. The projcct of draining the waters of such a large eheet as Eagle lake and forcing them to actually eerve as hewers of wood and cultivators of the soil, is an amhitious one and worthy of Western enterprise. There seems no reaeon why the scheme should not prove entirely successful.—*Esmeralda Herald.*

WINTER IN GUNNISON.—The season is approaching when the dwellers in the Gunnison region and those who have "stopped over" upon the reservation must provide themselves for a hard winter. This means the abandonment of surface prospecting nntil next spring. The principal mines under systematic operation, about Ruhy, Gothio and other advanced sections, can, if the owners choose, he conducted as nsual through the season, however severe it may he, if well housed, hut except where provided with smelters near at hand, they cannot market any ores. Thie will probably he the last winter of complete isolation for the Gunnison camps, because in anothcr year they will hs connected with the outside world hy railways.

STREET-CAR TRAFFIC in Philadelphia is to he changed, either hy introducing electricity or running the cars with a wire rope on the plan now on trial in Chicago. Referring to the wire-rope system, the president of one of the principle horse-car lines said, the other day: "The only thing we are waiting for is a test as to the climate. If it will etand the next wintsr in Chicago, then it will be introduced in Philadelphia next snnner.

MECHANICAL PROGRESS.

A Central Power Locomotive.

The prinoiple of the construction of the railroad locomotive, which has obtained up to the present time, has ever been considered exceedingly faulty. What is desired in a locomotive is such a construction as will admit of the motive power being located in the middle of the machine, with the center of gravity coincident with the vertical medium line of the engine. These objects being attained, it would be hardly possible to overestimate the value of the invention, since the locomotive will then be constructed upon correct principles and accordiag to natural laws. It would work from its center, with its motive power situated in a plane extending through its center of gravity, and would therefore have no dead weight. This problem seems to have been solved by Dr. Christian Rauh, of New York city. The Doctor, in order to thus definitely locate the center of gravity, has constructed his engine in such a manner that each half of the total structure, whether divided longitudinally or latsrally, is an exact counterpart or duplicate of the other half, both as regards weight or measure; the consequence of this is that the center of gravity is in the intersection of the longitudinal and transverse center plane of the entire locomotive; and by placing his motive power in the central transverse vertical plane of the engine he has disposed the parts of his locomotive to the best advantage for economy and efficiency. It has two boilers placed end to end, which extend the whole length of the locomotive. The ceb is in the center and covers the steam dome—the smoke-stack passing up through the center of the dome. The steam cylinders are vertical; they *may* be horizontal. The driving-wheels are situated equidistant from the center line. It has no tender, the water tanks being placed below the boiler, openings being made for the axles of the wheels to pass through. The fuel is carried in bunks arranged sideways and above the boiler.

The above are the main features of this novel engine, which the inventor claims as the first locomotive built upon strictly scientific principles, and the advantages claimed for it are numerous.

This engine has no dead weight, therefore its whole power can be utilized for drawing freight; and it is claimed that such a locomotive of any given size will do more work than any other locomotive of the same size under the same conditions. The heat is better utilized, as it is led back through the boiler by means of the return flues, and the fuel will be more fully consumed than it is now.

It is claimed that a train may be run at a much higher rate of speed with this engine and with much more safety than now, owing to the balanced driving wheels and the peculiar relation of the parts; and there is less danger of breaking the driving rods and less strain upon the track.

We understand that Dr. Raub is now making arrangements to build several locomotives according to his new system, of different patterns and sizes, in order to practically test their merits and superiority and to ascertain the actual percentage of saving in running them. This engine is illustrated in the *Scientific American* of the 15th inst.

Heating Steel.—Much of the difficulty experienced by machinists in occasional attempts to forge their own tools, says the *American Machinist*, comes from improperly heating the steel. To produce a good cutting tool, steel should be heated no more than is necessary to forge and temper. Follow the advice so frequently given, to heat slowly, but at the same time avoid being too long in heating. The best results are obtained by a moderate, even heat, until the proper degree is reached, and then forging at once. It is a great but common mistake to allow the piece to come to the proper heat and then lie in the fire with the blast shut off for some minutes. While this should not be done in the process of forging, the practice should be particularly guarded against when heating to harden. In the process of forging, the hammering in some degree seems to "restore" the steel; but when the tool is hardened and tempered from such a heat there is no possibility of its ever being of much use. In tempering, the drawing should be done quite slowly, as in this way a much better cutting tool is produced than when it is rapidly performed. The color is by no means a sure test of temper, since different kinds of steel do not take the same color for equal degrees of hardness. This is also true of steel that has been worked considerably, as old tools. The only guide in this respect is experience and judgment. Steel tools should never be heated, either for forging or tempering, in a fresh coal fire (unless it be charcoal). If coke is not at hand the fire should be allowed to burn until the gas is burned out of the coal, before the steel is introduced. What has been said in reference to heating steel for cutting tools is equally applicable to steel used in making springs.

How to Use a Cold Chisel.—Hold the instrument firmly to its cut without removing it at every blow. This will increase the effectiveness of the tool, and there will be less danger of breaking by a foul blow.

File Sharpening by the Sand Blast.

Among the various methods that have been tried to sharpen files, says the *Blacksmith and Wheelwright*, none can be said to be really successful but the sand-blast process. This consists in forcing a jet of fine sand at a high velocity against the backs of the teeth of the files, which cuts away the worn edges and leaves the file sharper than when new.

In explanation of this fact, it may be stated that it is well known that any fine edge is dulled to some extent if it is afterward heated to harden it. Furthermore, there is in new file teeth a burr that is more or less rounded, according to the sharpness of the file cutter's chisel, and this rounded burr the sand reduces to a plane, leaving a sharp cutting edge.

From some experiments that have been made, it was shown that a sand-blast file removed with the same number of file strokes (1,200) twice the amount of iron that a new file did.

It takes from two to five minutes (according to hardness, size, etc.) to sharpen a file by the sand blast, and each file may be sharpened a number of times.

This process possesses several advantages that are of great importance. Thus the softening and rehardening necessary to recut files damages the steel. In grinding out the old teeth the file is thinned and care is not taken to make the curve of even sweep. Indeed a recut file can be told because this taag shows its undue thickness. Whereas, in a sand-blast sharpened file no warpage and no reduction of thickness occurs. Hence the file retains its original and correct shape.

There is no need to lose time by using files that do not cut freely because we dislike to throw them aside as long as there is any cut to them. This process is as applicable to the finest of cut files and is already in use by some of the largest firms in the country, while from its simplicity and efficiency it must eventually be found in every workshop wherein files are used to any extent.

The *Blacksmith and Wheelwright* gives an illustration of a very simple machine, the cost of which can be but little and which may be operated in any shop, by which both sides of this file, large or small, may be sharpened simultaneously.

Names of Steel.

To the ordinary reader, the numerous names applied to steel are simply bewildering. He reads articles discussing the qualities of this most useful material, and encounters name after name which, conveying no definite idea to his mind, serve to increase his perplexity. They often leave him in doubt upon important points. It is true that writers occasionally stop to define a term, or describe the peculiar qualities and nature of the steel to which a certain name is given, but at the next moment they employ terms, by way of comparison or enumeration, which they assume the reader knows, because they have been before the public for a considerable period. This leaves him almost as badly off as though none of the names had been explained. The truth of the matter is, that owing to the numerous new processes and improvements in the manufacture of steel which have been introduced recently, the vocabulary has become greatly extended. The terms which were common a few years ago have become practically obsolete, or if now used are employed in a different sense from that to which our older mechanics became accustomed when learning their trades. A brief account of some of the most common names in use at present will be of service.

Blister steel is made by causing the carbon of charcoal to penetrate iron in a heated state. German steel is blister steel rolled down into bars. Sheet steel is made by hammering blister steel. Double shear steel is made by cutting up blister steel and putting it together and hammering again. Crucible steel is made by melting in a pot blister steel and wrought iron or unwrought iron and charcoal and scrap. Bessemer steel is made by blowing air through cast iron, burning out the silicon and carbon. Open hearth steel is made by melting pig iron and mixing wrought iron, or scrap steel, or iron ore to reduce the silicon and carbon.—*Blacksmith and Wheelwright.*

Phosphor Lead Bronze.—Mr. Moss, of Cheapside, London, is introducing a new alloy into the market, which is said to possess great strength and resistance to the effects of friction. The advantages claimed for phosphor lead bronze are—self-lubricating properties, tenfold wearing capacity of any other metal or alloy, great tensile strength combined with extreme hardness, non-liability to fracture, keeps perfectly cool under continuous and excessive friction. These qualities, it need hardly be said, are those most necessary for bearings and bushes of every description, guide blocks, slide valves and faces, piston rings, pinions, valves, etc.

The Temper of Steel, it is generally held is due to the chemical union of the iron with the carbon. At low temperatures this union seems to take place only in a slight degree, and hence in soft steel we have the carbon keeping aloof from the iron; but as the temperature is raised, the combination is more perfect, until, in the case of grey or glass hard steel we have really a kind of artificial diamond alloyed with iron. In all cases sudden cooling is necessary to fix the combination.

SCIENTIFIC PROGRESS.

Chemical Storage of Heat.

An invention of quite an interesting character has recently been made, in which the acetate of soda forms the chief factor. This invention, when divested of scientific language, may be stated to consist of the property of the acetate to absorb heat when subjected to it for some time, and then to give it out afterward over a prolonged period—in effect to store up heat, which, owing to crystalline changes during the act of cooling, is continued to be evolved from the latent into an active form. That this is the case is indicated by the fact that the vessel containing the salt, after having been removed from the source of heat for two hours, has its temperature raised about 6° Fahr. during the third hour by its own inner forces alone.

The physical principle upon which this curious invention is based is old and well known, although the application of the principle is novel. The form in which we have obtained a specimen "heater" consists of a somewhat large flask formed of thin sheet brass having its mouth soldered up, for it is never intended to be opened. There is also a metallic loop by which to suspend it in the vessel of boiling water from which it is to derive its store of heat. The length of time required for immersion in the hot water depends upon the size of the heater; for example, if it be so small as to be suitable for being carried in a lady's muff, by which to keep her hands warm, four or five minutes will suffice; but if, on the other hand, the dimensions be such as enact the part of a foot-warmer, this time would have to be increased by six or eight times. There are some so large as to require immersion in boiling water for an hour before they are fully charged with all the heat they are capable of storing.

While the length of time over which heat is given out depends entirely upon the dimensions of the flask containing the acetate of soda, it may be roughly estimated as about four times as long as hot water will retain its heat. This most sudden fall takes place during the first two hours, after which the temperature rises a few degrees, gradually subsiding until it becomes quite cold.

Influence of Magnetism on the Electro-Deposition of Metals.—Prof. Ira Remsen, of the John Hopkins University of Baltimore, has lately made some curious and instructive experiments, to determine whether the chemical behavior of a metal was in any way influenced by magnetic action. The results which he obtained were very interesting. Very striking effects were obtained by bringing a thin, shallow iron vessel, containing copper sulphate in solution, over the poles of a permanent magnet. Out of the magnetic field, the solution would deposit copper uniformly over the surface of the vessel; but in the field, the lines marking the poles were sharply defined as depressions in the deposit. With an electro-magnet the effects were still more noticeable. In the limited space marking the outline of the poles there was no deposit of copper; within this the deposit was fairly uniform, but outside, the copper was deposited in irregular ridges running at right angles to the lines of force, and apparently coincident with the lines marking the equi-potential surfaces. When the power of the electro-magnet was increased, the effects above noted were intensified and the area affected was broadened. These experiments open up a novel field of inquiry, and may in time result in important applications.

Engraving by Electricity.—M. Plante has succeeded in obtaining engravings on glass by the following process: The glass is laid in a horizontal position in a shallow vessel and covered with a concentrated solution of nitrate of potash. A platinum wire is dipped in a horizontal position in the solution along the edges of the glass. The platinum wire is in communication with one of the poles of a secondary battery of 50 to 60 elements. The lines are traced by hand with the point of an insulated platinum wire, which is in communication with the other pole of the battery. The parts of the glass covered with the alkaline solution become engraved when touched with the end of the platinum wire, however rapidly this is moved, the thickness of the lines varying with the thickness of the wire. The current from either pole can be led into the writing wire; that from the positive pole requires, however, a stronger current.

Colored Photographs.—How photography of colors may be accomplished by dying layers of coagulated albumen was lately explained to the French Academy of Science by C. Crose and J. Carpentier. They submitted two photographic proofs of a painting in water colors along with the original, showing the exact reproduction of the details and colors. Three photographs of the original were taken—one through a liquid orange screen, another through a liquid green screen, and a third through a liquid violet screen. For the image obtained through the first screen, a red color bath was employed; for that produced through the second screen, a blue bath; and for that effected through the third screen, a yellow bath. In this process there is evidently no direct photographic reproduction of objects with their natural colors.

The Value of Science.—Mr. J. D. Cox, ex-Secretary of the Interior, in the course of his address of welcome to the American Association for the Advancement of Science, at its late meeting in Cincinnati, remarked as follows: "Science is not without interest to all classes, and has a natural relation to business centers and economics. Science must be sought for its own sake, as all that is valuable in knowledge goes to complete the man. Since the first meeting of this association, more wonderful revolutions have taken place in the history of progress than ever in the same period before, and the triumphs of science are more marked. A scientific association is not for the profit of a business venture or for personal aggrandizement. The true fire of scientific zeal will rise into the domain of devotion, a devotion to science for its own sake, to an object worthy of its labor and higher than the accumulation of wealth. Some one has said, 'There is a natural tendency to give too much importance to a special department in science.' We need to concentrate all that makes intellect broad and ennobles soul-life."

A New Carbon for the Electric Light.—The waste of vegetable ivory placed in a lated retort and subjected to a cherry-red heat for three hours, is subsequently ground to a fine powder, mixed with a "suitable paste" and subjected in molds to heavy hydraulic pressure. The product of these operations is said to be superior to retort carbon for electric candles and probably also for batteries. The inventor, Mr. C. M. Ball, of Troy, thinks that his process is "going to revolutionize electric lighting."

New Thermograph.—Dr. W. D. Bowkott has invented, says the *Mechanical World*, a new instrument for recording changes of temperature as measured by the action of heat upon a bellow circular metallic ring connected with a circular vessel, the whole being filled with a fluid and hermetically sealed. One end of the ring is fixed, the other free to move, and the amount of motion is magnified and measured by a series of levers, one end of which carries the recording pen. Increments of heat cause increments of pressure in the ring, which, as in Bourdon's pressure gauge, then moves at its free end. The instrument had been largely used by Dr. Bowkett in the Leeds Fever Hospital for clinical purposes, but it was also adapted for many purposes of chemical and physical research.

Liquid Sugar.—Messrs. Sachenroeder & Gottfried, of Leipsic, have lately patented a process for obtaining liquid sugar which does not crystallize. Raw sugar with a high polarimetric power is clarified with a sugar solution, then passed through the Boegel turbine, and in this apparatus it is again clarified with steam, its polarization being brought to about 100°. The pure product thus obtained is dissolved in a boiler heated by steam, then passed through a system of charcoal filters, in which it becomes perfectly clear. In the vacuum apparatus the solution is reduced to 40° B., after the addition of one-fourth to one-fifth per cent. of chemically-pure crystallized citric acid or crystallized tartaric acid. The acid combines with the sugar, and deprives it of its tendency to crystallize.

Encke's Comet.—This well-known comet is now in a favorable position for observation. On Thursday last, October 20th, it was in right ascension 9 hours, 31 minutes + 19° 59', or about 4° north of Beta Leonis. It is moving a very little south of east at the rate of about three degrees daily. This has the shortest period of any known comet, making its revolution about the sun once in about 3½ years. It has no tail, but presents to the observer a flat, round disk, slightly condensed near one edge, while upon the opposite it has an ill-defined, brush-like appearance. It may be distinctly seen with a 2½ or 3-inch glass, and is quite a bright object when viewed through a 5-inch glass.

Magnesia from Sea Water.—M. Schlesing extracts magnesia from sea water by the following method: The magnesia is precipitated from the sea water by means of lime. One cubic meter of water, when thus treated and left to rest for one day, gives about 16 gallons of gelatinous precipitate of magnesia. If this precipitate is mixed with a weak solution of phosphoric acid, a precipitate of trihasic phosphate is obtained, which settles when left to rest, and can be filtered and used for the precipitation of ammonia from sewage by the methods already known.

The British Science Association recently held its fiftieth annual meeting at York. The occasion was made a jubilee gathering, and one of its most interesting features was a loan collection, in which the instruments of scientific research used half a century ago were contrasted with those now in use, with as complete a chain of intermediate links as far as could be obtained.

Grass Fired by a Meteorite.—A fire ball was seen to fall at Springfield, Ill., about 10 o'clock of the night of September 21st. It resembled in appearance an electric light, and it fell with a rushing sound like that of a skyrocket. The dry grass was set on fire where it struck, and the grass burned to a wooden sidewalk connecting with fences and wooden buildings, before the fire could be extinguished with water.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Sept. 29		Week Ending Oct. 6.		Week Ending Oct. 13.		Week Ending Oct. 20.	
Alpha	3.80	3.60	3¾	3	3¾	3⅛	3.80	3¼
Alta	5⅝	5¼	5¾	4.35	4.90	4.55	4.55	4.35
Andes	2.40	1⅞	2	1.60	1⅞	1.70	1¾	1.60
Albion	1.95	1.80	2⅛	1.90	2¼	2	2.40	2¼
Argenta	5c	....	....	....	....	....	5c	....
Addenda	15c	10c	15c	....	15c	10c	10c	....
Belcher	3¼	2¼	2¼	1.85	2.05	1.90	2	1.90
Belmont	....	....	2¼	1⅞	....	....	....	....
Best & Belcher	14½	12½	14½	11⅞	13⅞	12⅛	13	12⅝
Bullion	70c	65c	60c	50c	65c	55c	75c	65c
Bechtel	85c	75c	60c	70c	75c	70c	75c	70c
Bel Isle	10c	....	....	....	....	....	....	....
Bodie	7	....	6¾	6⅜	7⅜	8	———	
Benton	1.10	1	1.05	75c	90c	60c	80c	75c
Bulwer	2½	....	2½	1⅞	....	....	....	....
Boston	15c	....	5c	....	5c	....	25c	8c
Black Hawk	20c	15c	10c	....	5c	....	5c	....
Belvidere	....	....	10c	....	....	....	....	....
Booker	....	....	....	....	....	....	5c	....
Caledonia	25c	20c	20c	10c	10c	....	10c	5c
California	1.20	95c	1.10	95c	1	90c	95c	90c
Challenge	80c	....	90c	65c	70c	....	....	....
Chollar	2.70	2⅛	2¼	2.45	2⅛	2.30	2.65	2.45
Confidence	3¾	3.60	....	....	3⅛	3	3½	3.45
Con Imperial	25c	10c	20c	15c	20c	15c	25c	20c
Con Virginia	3.40	2.20	2¾	2.40	2.55	2.35	2.55	2.45
Crown Point	1.70	1½	1.40	1	1.85	1.70	1.85	1⅞
Columbus	25c	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1	....	1.15	1	1	....	1¼	1
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2½	2.30	2.45	2¼	2¼	....	2.40	....
E. Mt. Diablo	30c	25c	35c	20c	30c	....	30c	....
Eureka Con	27½	25¼	25¾	22	25	20c	21½	18
Exchequer	1.10	1	1.10	65c	1½	90c	1¼	1.20
Endowment	....	....	....	....	....	....	....	....
Grand Prize	30c	....	25c	10c	15c	10c	5c	....
Golden Gate	2.50	....	....	....	2.60	....	2¾	....
Goodshaw	40c	35c	40c	33c	35c	....	25c	....
Gould & Curry	8¾	7⅜	8¼	6¾	8⅜	7¼	7⅞	7¼
Hale & Norcross	4.40	3.90	3.70	3	3¼	3.05	3.40	3.15
Head Center	1	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
ndependence	....	....	....	....	....	....	15c	10c
Julia	25c	....	20c	10c	15c	10c	40c	10c
Justice	1	90c	95c	70c	75c	65c	1¼	90c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2.30	2.15	2¼	....	2¼	....	2⅜	....
Kosmuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	20c	....	20c	15c	20c	15c	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	2½	2	2.10	1⅞	2⅛	1⅞	2.10	2.05
McClinton	5c	....	....	....	....	....	....	....
Mono	2⅜	2.10	3.10	2	2.60	2⅛	2.35	2⅛
Mexican	12⅝	11⅞	10½	8½	9⅜	8⅝	9⅜	9¼
Mt. Diablo	6½	....	6	5⅜	6	5¼	5	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	20c	5c	20c	5c
Neonday	55c	50c	50c	25c	60c	50c	50c	30c
New York	15c	....	....	....	10c	5c	10c	5c
Northern Belle	13¾	11⅞	12	11⅛	12⅜	11⅛	11⅞	11⅛
North Neonday	....	....	30c	25c	40c	30c	35c	....
Navajo	....	....	....	....	60c	....	50c	....
Occidental	1⅛	1.45	1⅛	1.30	1⅛	1.40	1.40	1⅛
Ophir	9⅛	8⅛	7⅞	6	7⅛	6⅜	7⅞	6⅝
Original Keystone	....	....	....	....	....	....	....	....
Overman	2.60	2.15	1⅞	1.20	1.65	1.45	1.80	1.45
Oro	70c	65c	75c	70c	70c	80c	60c	40c
Paris	....	....	....	....	....	....	....	....
Potosi	3⅜	2.95	3¼	3	3	2.80	3.10	2.85
Queen Bee	5c	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	3.20	2.85	3.30	2.60	4.05	3.40	4⅛	4.10
Seg Belcher	8	....	7¾	....	7⅞	7¼	7⅞	7
Sierra Nevada	24⅜	20¼	19	13⅜	16⅛	14⅜	16⅝	16⅜
Silver Hill	30c	20c	30c	20c	30c	25c	30c	25c
Silver King	18¼	13⅛	17⅜	17	18⅜	18¼	19	17½
Succor	....	....	....	....	....	....	....	....
Summit	25c	....	15c	....	....	....	20c	....
Scorpion	2.30	2	2.10	1⅛	1.80	1.65	1⅞	1.70
Solid Silver	35c	....	45c	40c	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	40c	....	....	....	40c	....	40c	....
Moga Con	40c	....	45c	35c	50c	35c	30c	20c
Tiptop	6	....	5⅞	....	6¼	5¾	....	....
Tuscarora	20c	....	25c	....	20c	15c	15c	....
Union Con	16	14⅜	14	12⅜	14½	13⅜	15	13⅜
Utah	12½	11⅜	9½	7⅜	8¼	7⅞	7⅞	7½
Ward	....	....	....	....	2½	....	....	....
Wales	....	....	....	....	75c	....	50c	....
Yellow Jacket	5¼	5	4⅞	4.10	4.30	4.15	4.40	4.30

Sales at S. F. Stock Exchange.

Thursday A.M., Oct. 20.

100 Alpha.....3.60
100 Alta.....4.35@4.40
75 Andes.....1.70@1⅞
450 Bullion.....70@65c
125 B & Belcher.....13
465 Belcher.....2@1.95
250 Crown Point.....1.85
2500 Con Imperial.....25@20c
1000 Caledonia.....10c
250 California.....90@95c
150 Chollar.....2.40
430 Con Virginia.....2½
100 Exchequer.....1⅛
75 Gould & Curry.....7⅞
50 Hale & Nor.....3.30
150 Julia.....35@40c
100 Kentuck.....2½
125 Mexican.....9⅛
300 Ophir.....6⅞@7
625 Overman.....1.80@1⅞
200 Potosi.....2.95
320 Savage.....4.20
360 Sierra Nevada...16⅜@16⅝
45 Seg Belcher.....7⅞@7
850 Silver Hill.....30c
100 Scorpion.....1.70
405 Union.....14⅝@15
100 Utah.....7⅛
30 Yellow Jacket.....4.30

AFTERNOON SESSION.

200 Argenta.....5c
200 Albion.....2.30
15 Addenda.....10c
50 Bechtel.....75c
100 Booker.....5c
100 Boston.....25c
130 Belding.....20c
300 Bodie Tunnel.....80c
50 C Pacific.....50c
500 Day.....2.35
150 Eureka Con.....17
250 E Mt Diablo.....25c
700 Grand Prize.....5c
15 Goodshaw.....40c
200 Holmes.....40c
200 M White.....3⅛@3¼
165 Neonday.....50c
150 Northern Belle.....11⅞
100 Navajo.....35c
500 N Belle Is.....25c
2500 Oro.....40c
100 Final.....4½
40 Silver King.....18¾
100 Syndicate.....35c
100 Tioga Con.....25c
400 Tuscarora.....10c
100 Wales.....40c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Bechtel, October 10th, $9,901.19; Northern Belle, 12th, $6,230.65; Westeru, 14th, $10,685.50; Bodie, 15, $5,000; Northern Belle, 16th, $6,100; Silver King, 17th, $21,800; Star, 17th, $2,800; Horn Silver, 11th, $5,000; Barbee & Walker, 11th, $1,537; Stormont, 11th, $3,665; Mayflower, 11th, $5,730; Horn Silver, 12th, $7,500; Barbee & Walker, 14th, $2,195; Horn Silver, 14th, $2,500.

The Artesian well at Yankton, D. T., flows so abundantly at the depth of 500 ft. that further sinking has been stopped.

Cold Weather in Nevada.—On the night of the 12th instant the thermometer fell to 22 degrees along the valley of the Hmmboldt.

Hiyou Mucamuc.—The Klamath Indians have raised 20,000 bushels of wheat this year.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argenta M Co	Nevada	9	10	Sept 6	Oct 7	Oct 26	F M Hall	327 Pine st
Benton Con Co	Nevada	6	25	Oct 14	Nov 18	Dec 8	W H Watson	302 Montgomery st
Belcher M Co	Nevada	23	1 00	Sept 29	Nov 1	Nov 24	J Crockett	327 Pine st
Belle Isle M Co	Nevada	3	10	Sept 13	Oct 18	Nov 8	E M Hall	327 Pine st
Boston Mon Co	California	2	20	Sept 15	Oct 21	Nov 12	F D Laty	320 Pine st
Bullion M Co	Nevada	24	1 00	Sept 21	Oct 26	Nov 15	J M Brazell	328 Montgomery st
Belvidere M Co	Californuia	12	25	Sept 22	Oct 29	Nov 21	C V Hubbard	310 Pine st
Champion G & S M Co	California	3	25	Sept 19	Oct 25	Nov 15	B Burns	309 Montgomery st
Crown Point G & S M Co	Nevada	45	75	Sept 7	Oct 12	Nov 2	Jas S Newlands	327 Pine st
California M Co	Nevada	2	10	Oct 4	Nov 9	Nov 30	F F Stone	306 Pine st
Caledonia M Co	Nevada	27	25	Sept 29	Nov 2	Nov 22	F Wegener	———
East Mt. Diablo	California	2	10	Sept 27	Oct 31	Nov 21	G W Fisher	324 Pine st
Eintracht G M Co	California	8	05	Sept 27	Nov 2	Nov 19	H Kuntz	208 Sansome st
Exchequer M Co	Nevada	17	25	Sept 8	Oct 12	Oct 31	C E Elliott	327 Pine st
Goodshaw M Co	California	9	15	Oct 12	Nov 17	Dec 8	Chas O Harvey	309 Montgomery st
Grand Prize M Co	Nevada	7	25	Sept 30	Nov 1	Nov 21	E M Hall	327 Pine st
Hale & Norcross M Co	Nevada	71	50	Oct 6	Nov 9	Dec 1	J F Lightner	309 Montgomery st
Harrington M Co	California	2	03	Jun 15	Oct 14	Nov 5	O C Miller	409 California st
Julia Con M Co	Nevada	16	30	Sept 16	Oct 21	Nov 11	H A Charles	419 California st
Justice M Co	Nevada	35	25	Sept 13	Oct 18	Nov 8	R E Kelly	419 California st
Lord of Lorn M Co	Nevada	2	10	Oct 8	Nov 17	Dec 13	R N Van Brunt	313 Pine st
Mayhelle Con M Co	California	9	20	Sept 20	Oct 26	Nov 18	W J Taylor	310 Pine st
Murchie G & S M Co	Nevada	7	15	Sept 7	Oct 11	Nov 10	Wm Letts Oliver	328 Montgomery st
Mexican M Co	Nevada	17	1 00	Oct 4	Nov 8	Nov 26	C L McCoy	309 Montgomery st
Mono M Co	California	14	00	Oct 4	Nov 9	Nov 29	W H Lent	309 Montgomery st
May Flower Gr M Co	California	13	10	Oct 12	Nov 16	Dec 7	J Morizio	328 Montgomery st
Ophir M Co	Nevada	40	1 00	Sept 30	Nov 3	Nov 23	C L McCoy	309 Montgomery st
Overman S M Co	Nevada	51	50	Oct 17	Nov 17	Dec 8	G D Edwards	414 California st
Occidental Con Gravel M Co	California	8	06	Aug 22	Oct 3	Oct 26	W T Smith	414 California st
Potosi M Co	Nevada	6	50	Aug 29	Oct 4	Oct 25	W E Dean	309 Montgomery st
Quartz Mountain M Co	California	13	75	Oct 7	Nov 14	Dec 5	E Hestris	729 Montgomery st
Rocky Point M Co	California	9	05	Oct 12	Nov 14	Dec 5	D M Kent	330 Pine st
Sierra Nev S M Co	Nevada	70	1 00	Oct 6	Nov 10	Nov 29	E L Parker	309 Montgomery st
Savage M Co	Nevada	47	50	Sept 5	Oct 7	Oct 27	E B Holmes	329 Montgomery st
Tuscarora M & M Co	Nevada	9	15	Oct 17	Nov 22	Dec 14	M E Sperling	309 California st
Utah S M Co	Nevada	36	2 00	Oct 13	Nov 16	Dec 6	G C Pratt	309 Montgomery st
Union Con S M Co	Nevada	18	1 00	Oct 10	Nov 14	Dec 5	J M Buffington	309 Montgomery st
Wide Awake M Co	Arizona	14	10	Sept 16	Oct 21	Nov 12	C Hildebrandt	Bush & Kearny sts
Yellow Jacket S M Co	Nevada	42	1 00	Oct 4	Nov 9	Dec 6	N Otey	———

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Bengal M Co	Arizona	1	02	Aug 31	Oct 7	Oct 29	J H Sayre	330 Pine st
North Sierra Nev Co	Nevada	3	10	Sept 19	Oct 27	Nov 17	C C Harvey	309 California st
South Hite M Co	California	2	10	Sept 1	Oct 5	Oct 29	T A Berlin	515 California st
Western Home Con M Co	Idaho	2	05	Aug 16	Sept 26	Oct 26	A Halsey	328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alexander M Co	———	A B Cooper	326 Montgomery st	Annual	Oct 31
Gold Lead G & S M Co	———	D Frankiades	331 Montgomery st	Annual	Nov 4
Happy Valley G M Co	California	D M Kent	330 Pine st	Annual	Oct 24
Ida M & M Co	———	B F Dahl	331 Montgomery st.	Annual	Oct 25
Shawmut G Q M Co	———	J S Bacon	316 California st	Annual	Oct 27

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Sept 27
Father De Smet M Co	Dakota	H Dean	New York	50	Sept 10
Northern Belle M & M Co	———	Chl Wm Willis	309 Montgomery st	50	Oct 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Oct 15
Silver King M Co	Arizona	J Nash	315 California st	25	Oct 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Oct 12
Tip Top M Co	Arizona	H Deas	309 Montgomery st	20	Aug 25
Western M Co	California	O S Curtiss	309 Montgomery st	75	Sept 10

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Suffolk M. Co.—Oct. 7. Location, Sierra and Plumas counties. Capital stock, $300,000. Directors—Edward Cunningbnm, J. H. Hyman, J. C. Lyman, D. O. Clark and J. C. Watson.

Gibraltar Con. M. Co.—Oct 9. Sierra Co , Cal. Capital stock, $200,000. Directors—H. J. Wilsdorff, M. Burth, P. Dolan, H. White and F. Becker.

Bush Creek M. & M. Co.—Oct. 9. Sierra Co., Cal. Capital stock, $3,500,000. Directors—A. Bateman, H. H. Pearson, Wm. Thomas, A. C. Wightman, S. E. Olmsted.

Humboldt M. & M. Co.—Oct. 12. Aurora, Nev. Capital stock, $10,000,000. Directors—J. D. Fry, C. H. Fish, G. W. Horkins, S. B. Boswell and B. G. Blasdel.

Gold Canyon M. Co.—Oct. 11. Sierra Co, Cal. Capital stock, $1,000,000. Directors—D. R. McKilican, C. Haight, F. Underhill, E. Greenbaum and F. A. Berlin..

Santa Gertrudes G. & S. M. Co.—Oct. 13. Capital stock, $10,000,000. Directors—John H. Dickinson, W. P. Willard, John Crocker, W. H. Talbot, H. H. Hubbard.

Quijotoa M. Co.—Oct. 14. Pima Co., Arizona. Capital stock, $10,000,000. Directors—Wm. S. Wood, Robert N. Graves, Wm. S. Lyle, D. M. Tyrrell, Chas H. Fish. The Gesco Mining Co. has also incorporated to operate in the same place, with the same officers.

The Contention Con. M. Co.—Oct. 10. Tombstone district, Arizona. Capital stock, $12,500,000. Directors—W. F. Dean, W. S. Hobart, Geo. I. Ives, D. A. Jenmngs, I. L. Requa.

The Mining Share Market.

Stocks througbout the week, though moderately active, have been without material variations in price. The attendance at the Board has also diminished and the volume of bnsiness done by the legitimate trade been gradnally curtailed of late, leaving transactions mostly in the hands of "chippers in" and carbstone brokers.

Meantime the Comstock press continues to describe with accnstomed volnbility the work in progress on the "great non-productive," after the manner of those who are said to "darken council with language." This thing, tbougb getting to be a little monotonous, is, nnder the circumstances, all that can probably be done.

The Californian.—The *Californian* is proceeding commendably and brings ont an excellent collection of original articles eacb month. There are now two noble serials running, one by Joaquin Miller, entitled "One of the World Builders," with its scene in the mining camps in the early days, the other, "At Cobweb and Crusty," by Leonard Kip. C. H. Shinn has a little dash of poetical prose about the garden, and Hon. B. B. Redding places upon record some interesting observations about California Indians and their food. There are several otber excellent articles in the November issne which appears this week.

It is rumored that with the proceeds of sale of all bis interests in the Iron Silver mine, Levi Z. Leiter, of Chicago, has made Judge Hilton an offer for all the dry goods business of A. T. Stewart & Co. Mines are profitable occasionally.

Comstock Lexicon.

Phrasee and Sentiments Peculiar to Stock Operators.

Eastern jonrnals devoted to stock matters use every possible effort to keep their readers posted on the jargon of the street, and publish definitions of words and phrasos cnrrent among the speculators of Wall and Broad streets, the Chicago and St. Lonis Chambers of Commerce, etc. The idea is worthy of adoption here, and as an initial step the *Chronicle* submits the following carefully compiled "Lexicon of the Comstock:"

Bear Market—So called because operators have to "grin and bear it."

To Sell Short—To promise to deliver what you haven't got. Often adopted ontside of stocks, with a paralyzing effect on credulous creditors.

To Cover One's Shorts—Generally, to buy at a big loss.

A Call—Tbis, from your broker, generally means "More mud."

More Mud—A peremptory demand that the unhappy pnrchaser sball wallow more deeply in the financial slough of despond.

Curbstone Brokers—Men who rule the market—in their minds, and always have millions—to get.

Corners—Expressive of the tight pinch given short sellers on an oversold market.

Highest Quotations—What buyers pay for stock.

Lowest Quotations—What sellers get for sbares.

Commissions—Net gains on stock operations exclusively belonging to the brokers.

Carrying Stock—Packing it from one broker to make good your overdraft with another.

Flyer—A clever little operation on the side, which generally bursts the main game.

Limited Order—Five shares at one fell swoop—largely in vogue on the Comstock.

Put—Tbe privelege of going througb and "staying out."

Margins—What operators say they will never buy on and always do.

Milking the Street—A dairy operation not attempted on C street—only appropriate for experienced pullers at the stock teat.—*Virginia (Nev.) Chronicle.*

Jumped Claims.—One of the ablest of the United Statcs District Judges of Colorado, in prononncing a recent decision upon a jumped claim, used the following langnage, substantially: "The law supposes or takes for granted that whero a man puts $100 worth of work on a claim or location, that mineral was there to justify the expenditure, or else a man wonld not be foolish enongb to put his time or money to snch a nse; and no man has the right to go on the claim of another and break the surface ground to prospect. In other words, the law accepts the acts of a miner or prospector in good faitb, and his fellowmen should do the same and keep their hands off."

Mining Summary.

The following is mostly condonsed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Mining Notes.—*Ledger*, Oct. 15: All the miners are waiting for rain. The Golden Gate is running at present. The stockholders in the Welch Hill Tunnel Co. have strong hopes of something very fine in their undertaking. The Zeile mine gives employment to about 60 miners, divided into two shifts of 10 hours each. Milling ore is extracted from the 240, 400 and 600 levels, and there is sufficient rock in sight to last for years. The quality of the ore is not definitely known, but the general impression is that the chief dependence is on the sulphurets, which are produced in large quantities, and rich in quality. The amount of free gold turned out is probably small, but the sulphurets alone are perhaps rich enough to pay all working expenses. The Modoc mine in Pioneer district, has just had 100 tons of ore crushed at Mace's mill. The yield is said to be satisfactory. Fifty tons more are to be put through immediately.

Manganese.—The character of the ore now being sent to the mill is a great improvement upon the rock crushed for months past. The shaft has been drained of water, and the workmen have been enabled to get at the 600 level, where quartz of the richest description was known to exist. It is from this portion of the mine that the bulk of the millling ore is now being taken.

Empire.—A rich body of ore has lately been struck in this mine nt the 1200 level. Owing to the scarcity of the water supply, tbe mill is at present being run entirely by steam power.

Pacific.—The shaft of the Pacific mine, at Plymouth, is down 1,000 ft, at which point they propose to commence drifting for the ledge which will no doubt be struck in a few hundred ft. The frame work of the new mill is nearly completed, and all will soon be in readiness for operation. The pipe leading from the Amador canal, for conducting water to this mine, is now being lain across Amador, Rancheria and Dry creeks.

Work has been commenced in good earnest, on the Oswega claim, about one mile nortb of Plymouth. It is believed that this will provo a valuable property when more fully developed.

The Tallsman mill, near Amador City, which has been lying idle for some time past, has again been put in running condition, and is crushing rock from a mine back of the Keystone, which is being prospected by a San Francisco company.

Sinking on the Golden Gate mine at Volcano is progressing finely, and the ledge maintains its regular width and thickness. The Downs mill of the same place is still idle, owing to a want of water.

A Dead Property.—The old Oncida mine, near Jackson, is evidently a thing of the past. Everything around the old works is as dead as can be. Nothing of any valuo is being allowed to remain on the premisos. So far as appearances go, there is a total abandonment of the mine.

CALAVERAS.

Mining about West Point.—*Chronicle*, Oct. 15: Mining about this town was never in a better condition than at present, more tban 20 mines being worked by Companies belonging to the place. Among the claims most actively worked are the following: The Pride of Bummerville, running night and day, bas a 2-ft ledge which pays $60 per tou. Ten tons on the dump, and only 40 ft deep. Sacramento is running two shifts, with 10 tons of rock on the dump which will pay $60 per ton. The lode is 2 ft wide. Present depth of shaft about 120 feet. Old French Lode is also turning out precious metal again. McClane & Co. are taking out rich rock on the Old Whisky Lode. The best ore milled paid $50 per ton. The Riverside has about 50 tons of rock on the dump, 20 tons of which will pay $100 per ton, and the rest about $20 per ton. Intend to commence crushing shortly. The Lone Star is again being worked, taking out quartz that will pay $150 per ton. Has 400 tons on the dump that will pay $12 per ton. The owners intend, when they have out 1,000 tons of such rock, to erect a mill near the mine. Keltz & Block have out about 20 tons of rock from the Constitution mine, which will pay 1 oz. per cargo, or nearly $120 per ton. Intend to crush in the near future. Champion mine is at present over 700 ft deep and still sinking on rich rock. Rose & Jenkins are taking out rich rock from the Henry mine, 120 ft deep, about 2 ft of good ore. Sixty tons on the dump which, by a proper process of milling, ought to pay $80 per ton. The owners have leased the chlorination mill for a short time and intend making nlterations therein preparatory to working a few tons of their heavy sulphuretted quartz. Ferguson & Co. are still running levels on the Florida mine, with rich quartz still ahead, plenty of gold to be seen with the naked eye. They deserve success as the pioneers of the compressed air drill in this mining district. Moore & Co. have struck a large chimney of good quartz on the Bowers mine. T. & W. Proteus have commenced sinking on the old Colorado and have struck a vein 20 inches wide, the ore in which prospects $40 per ton, free milling. G. Brown & Co. recently struck a good lode near the stage road at Sandy Gulch. Rock crushed paid $60 oer ton. Mr. C. Bailey has leased the quartz mill owned by A. M. Harris, and has put it in first-class order for crushing. The Jacobs mine is having a tunnel run on it which will tap the lode about 90 ft below the old works, and thoroughly prospect it. This mine was worked in early days down to hard ground and water. Width of lode about 20 inches. The rock taken above paid $60 per ton. The Pride of the West owned by Sterling & Co., is having a large timbered shaft put down on it. There have been some new strikes in placer mining up on the South Fork of the Middle Fork of the Mokelumne river. A number of "bars" in the river have been found which prospect 4 cents to the pan. Stephens & Co. have also struck rich gravel under the lava bed on the road to Anderson Flat, which is very extensive and prospects well.

Insufficient Machinery.—The Chapman mine, 2½ miles from Railroad Flat, bas been forced to shut down, the pumping machinery at present in uso being incapable of handling the water. In drifting north on the 200 level they cut through a large body of very rich ore, not a pound of which bas been stoped out. It is the intention of the company to sink and drift, cutting this ore body at a depth of 200 ft below the present workings, as soon as machinery is in place capable of handling the water. This is one of the best mines in that section of country, not a pound of waste rock ever having been taken out of the mine.

EL DORADO.

Grizzly Flat.—*Mountain Democrat*, Oct. 15: The Melton mill has been completed, and in a few days will start up on one of Driesbach's mines, from which good results are assured. Mr. Bullard of the Sacramento mine, will soon have his mill ready to run. He is working a large force of hands on it. Mr. Spencer, of the Grouse Gulch mine, has his hoisting works about completed, and in a few days will begin sinking, and will also commence putting up a new mill quite soon. The contractors on the Treat mine have about half finished their contract. At the Mount Pleasant mino work is being actively prosecuted on the new mill and hoisting works. The Arctic mill is running steadily on good ore from the Polar mine. Mr. Sam Davis, Superintendent of the Arctic and Eagle mines, is expected back from Sacramento in a few days, to start the Eagle mine up. Mr. Smith, lately from Mount Pleasant, Iowa, has discovered a very rich ledge near town, 7 feet wide, and the ore yields very rich prospects.

Rosebrans.—Fine hoisting works have been put up on thia mine, and underground worka are being proaccuted night and day. At the 130 level they have run 220 ft on the vein, milling every pound of rock that haa come out, and all of it has paid. For this entire distance the lode

has held its size of 3½ ft, and it is predicted that the pay chute is fully 900 ft in length. The fact that all of the rock from 220 ft of tunnel has been milled, and has paid well for milling, is sufficient to entitle the Rockrams to a front rank among the best of California quartz properties.

INYO.

PANAMINT.—*Independent*, Oct. 18: It is stated that Supt. Phelps, of the Inyo Con. Co.'s works, at Panamint, left New York for this coast on the 4th inst., "duly prepared for vigorous work." This will be good news for that camp. It is also stated that Senator Jones is going to look after mail facilities.

REX MONTIS.—Sup. Holt has the Rex Montis mill repaired, and was to start up on the 12th. A run will be made on a large amount of old tailings.

BISHOP.—The mining interests of Bishop Creek continue on the up grade. The Polete and Red Cloud are considered a fixed fact and several of the prospects on the hill are looking well.

MARIPOSA.

THOMAS THOMPSON.—*Gazette*, Oct. 15: The last clean-up here from an arastra paid $153 to the ton. The vein is mostly of decomposed matter similar to the Diltz. A small engine and two stamps are being put up, which will enable its owners to crush about two tons a day. The mine is prospected by a tunnel about 100 ft in length, and the shaft is down some 50 ft. This mine is situated on the northerly slope of the mountain at the head of Cathey's valley, and about one quarter of a mile westerly of the wagon road leading from Agua Frio to Cathey's valley.

DILTZ MINE.—At the bottom of the shaft, now 75 ft deep, a fine body of ore has been struck. This last discovery, shows conclusively that the main lead of ore, which has been the principal feeder of all this section, lies in the course of the shaft and level running northerly. Although Mr. Diltz works but a limited force of men upon his mine, every week as he progresses in developing shows the permaneucy and richness of this mine.

MONO.

THE GREAT SIERRA OF TIOGA.—*Free Press*, Oct. 18: The new double-compartment shaft is now down 87 ft; 7 ft have been added since last report. Have finished timbering the shaft. The ledge is pitching so much to the west that it has left the shaft, but a new spur has been encountered. Will be ready to cross-cut on the 10th inst. The boarding-house, shaft-house and blacksmith-shop are all up, and the gallows frame, 21 ft, 6 inches in hight, is now ready for machinery. The pack mules are still busy getting in supplies.

SQUAWVINE HYDRAULIC.—Stewart & Taylor, the owners of the Squawvine hydraulic mine in the old Mono diggings, are meet ng with great success by their enterprise. The mine is situated a short distance west southwest from the old Sinnamon cut. They have in 300 ft of pipe, with 75 ft fall, and 175 ft of sluices in place. A cut 15 ft in width, follows the bedrock in for a distance of 40 ft, and this gives a bank or face of gravel 20 ft high, 17 ft of which is pay dirt. The tunnel run into this mass gives prospects of from 2 to 8 ounces to the pan. They have a head of 100 inches of water, but the cold frequently reduces this to 80 inches.

ITEMS.—Good looking quartz has been found about the head of Virginia creek. Work has been resumed on the 1000 level of the Standard. In two or three weeks the sound of the locomotive will be heard in Bodie. The Addenda mine is prospecting well.

NEVADA.

WORK FOR ALL.—*Transcript*, Oct. 13: Since the hydraulic mines re-commenced operations the hundreds of men who were thrown out of employment when operations were suspended, and did not possess the means to get away, have gone to their old places once more. Those who left the county at the time are gradually drifting back again. Employment is found for all worthy applicants, and the demand is much greater than the supply at present. The force at one of the mines will be increased some 500 men within the next 30 days. The best part of all is, that Chinamen cannot obtain work of any kind. Everybody at North Bloomfield is happy. The people who, a fortnight ago, were despondent, are now contented with the prospect of a prosperous winter. The merchants are laying in an immense stock of goods.

BANNER.—An interest in the Banner quartz mine of this district has recently been disposed of to obtain additional working capital, and the development of the property will now progress on a much more extensive scale than heretofore. A new 12-inch Corliss engine, with heavier hoisting and pumping machinery, has been ordered to take the place of the present plant. The incline, now 280 ft deep, will be enlarged so as to have three compartments, and then be sunk to a depth of 800 ft before drifting for the Golconda chute, which was many years ago worked to a depth of 300 ft, and yielded $750,000. It is now more than a year since work was begun on the claim, and the developments have been such as to demonstrate that the chute extends ou downward from the point where the old company quit work ou it, but that the purchase of more powerful machinery will be necessary in order to open it. The tunnel recently run will drain the mine to a depth of 100 ft, thus relieving the pumps of the surface water.

RICH STRIKE.—The Los Angeles Co., on Fall creek, 27 miles northeast of Nevada City, recently started a tunnel into the bank, and after running a short distance struck in a very rich gravel deposit. Many large nuggets are found, one of them being valued at $400. An experienced miner, "Sir" John Lyons, is in charge of the property. When work was started there is said that some of the old miners in Washington township had lots of fun about the idea of going to such a spot to look for auriferous channel. Now the laugh is on the other side of the house. This new bonanza is just above the old King claim, where some 20 years ago George King (now dead), and Joe Freeman took out $110,000, or thereabouts.

VARIOUS MINES.—Souchet, quartz, still running with favorable outlook. The new shaft on the Derbec has reached bedrock, at a depth of 247 ft. It will have to be put down 38 ft further to reach the old workings. Sixty white men are working at the Malakoff hydraulic; 40 to 60 more will be put on within the next 30 days. No Chinese need apply. The tunnel of the Chapman ranch mine is now in 80 ft or more. A stringer of good quartz was struck Wednesday, and it is anticipated that the main lead will be opened on within a distance of 25 ft more. Then the force of workmen will be increased, and drifting in both directions will begin.

PLACER.

MINARICA MINE.—*Herald*, Oct. 15: Since the purchase of this mine last spring by Eastern gentlemen, work has progressed on it steadily, and some very satisfactory developments have been made. A tunnel is now in about 300 ft, and for the whole distance the ore vein maintains a width of from 14 to 24 inches. The pay chute is believed to extend the entire distance of the tunnel, and possibly, much farther, since all the ore taken out along the line has been of high grade. From near the end of the tunnel an air shaft has been raised some 90 ft to the surface, by means of which the mine is thoroughly ventilated. About 250 ft from the mouth a winze has been sunk to a depth of 50 ft, and the size of the vein and the encouraging character of the ore are maintained to the very bottom. At present the force is engaged in stoping out the ore above the tunnel. It being only a few hundred feet from the mouth of the tunnel to Pelster's mill, a tramway is being built from the mine to the mill, with the view of running the ore on hand-cars directly to the batteries, and thus obviate the expenses of extra handling. The crushings thus far under the new management, have been quite satisfactory. Expect to crush from 75 to 100 tons the present month.

THE HUNTER MINE.—T. J. Hunter is steadily at work developing his mine on North Ravine, and has obtained some satisfactory prospects. He has sunk a working shaft which thoroughly ventilates the works, and has now a force of men driving ahead in the main drift. This ledge is of good size, and the rock thus far taken out has been, on an average, very rich.

PLUMAS.

CHEROKEE MINE.—*Greenville Bulletin*, Oct 12: The shaft is 204 ft deep to the ledge lately struck; which latter maintains an average width of 3 ft, all pay as far as opened—some 30 ft on the line of the vein. The vein proper is from 5 to 6 ft in width between walls, but where first cut the pay ledge does not occupy the whole width of the fissure. The ore is rich in fine free gold, some portions of it being remarkably so, for this locality, and none of it is barren. It is confidently expected that the ledge will entirely fill the fissure when a point has been reached a little farther west; this will make a very fine body of ore.

SAN DIEGO.

JULIAN DISTRICT.—*News*, Oct. 14: The mines are all doing something better, and here there is a hopeful feeling prevailing with both the miner and the farmer. A Spanish man discovered, on Sunday last, near Julian, what is believed to be one of the richest ledges yet found in the district, being wider than most ledges in the mining belt there. It will be worked immediately, and if it proves as rich as supposed, will help the section vastly, as all will get something from it.

SIERRA.

DRIFT.—*Mountain Messenger*, Oct. 15: Four men took out 60 ozs. from the Bald Mountain Extension mine at Forest City, last week, no more being able to work underground on account of impure air. In three weeks, when the new air-pipe is laid in the main tunnel, Superintendent Lawry says he can put on at least 50 men. Total yield of mine since first prospect, near face of main tunnel, $7,000. The prospect is now that no more assessments will be levied. Up to Tuesday night, 31 ozs. were taken out this week.

NEVADA.

CHERRY CREEK DISTRICT.

MAKING BULLION.—*News*, Oct. 15: The Star mill, since the recent repairs, is doing good work. Supt. Foulke informs us he feels confident he will be able to run 750 tons per month through the mill, being 150 tons more than was ever handled before in the same time. He expects to turn out bullion to the value of $40,000 to $45,000 per month. The mine is looking well, and has more ore in sight to-day than ever before. The work of sinking the shaft is progressing satisfactorily.

MARTIN WHITE.—Supt. Sweetapple writes the company as follows: Getting on well with the work in the raise, preparing it to receive all the waste from above, and in a day or two will have the air pipe secured against danger from falling rocks, etc. Have air enough in the mine now and are putting in doors in the tunnel to check the current which is too strong for comfort in working. Shall not attempt to do any work in the way of opening up until I get all this work completed, as the men would only be working against each other.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, Oct. 15: During the past week the mine has shown no change of importance. The shaft levels present about the same appearance as at time of last report. There is some improvement in the 12th, where the ore is of fair grade and shows a vein 2 ft in width. The 10th and 11th are looking and yielding as usual. The levels above present no change worthy of note. There are being extracted and sent to the mills about 36 tons of ore daily. Mill No. 1 is running steadily. Mill No. 2 was stopped on the 10th inst. for repairs, but will start up again early next week. Bullion shipments for the week ending Oct. 12th, $23,578 52. Shipments on October account to Oct. 12th, $30,693 05.

MOUNT COREY MINES.—About 35 men are at work in the camp. The town boasts a store, blacksmith shop, lodging house, boarding house and a saloon. The little 8-stamp mill is getting away with 8 to 10 tons of Big Injun ore daily. The ore has to be hauled about three-quarters of a mile. Many claims are being opened, and the prospects are accounted good.

MARIETTA.—In this town, which for a long time before was extremely dull, business has undergone some improvement of late owing to a somewhat better outlook in the neighboring mines.

EUREKA DISTRICT.

STRIKE.—*Sentinel*, Oct. 13: The Monument Tunnel Co. have struck an immense body of galena ore. As yet there have been no assays made of it, but the indications are that it is a rich find. It is seldom that a tunnel enterprise starts out with such encouraging prospects.

A NEW TUNNEL.—A survey has just been completed at the Geddes & Bertrand for a tunnel from the mill to the 300 level of the mine. The tunnel will be 500 or 600 ft in length, and when completed the ore will be run through it instead of being hoisted up through the shaft.

ESMERALDA DISTRICT.

THE CORTEZ.—*Herald*, Oct. 15: Face of the lower tunnel here is in better working ground and good headway is being made. The drifts and incline show splendid ore and in large quantities.

SWEETWATER MINES.—Great Western shows improvement within the last week. The face of the drift north from the tunnel, now in about 40 ft on the ledge, shows fine milling ore. The lower tunnel is in about 20 ft and has struck the first ledge, which contains excellent ore. The Somers is being developed as rapidly as men and means can do it. The main tunnel runs north; about 60 ft from the mouth a cross cut was run west which cut the ledge. Ore found of high grade. Ledge about 4 ft wide. Now drifting north, and upraising on the vein, which continues to show the same character of high-grade ore at every point. A number of other prospects in the district are looking well. From some of these claims pay ore is being taken in good quantities. There are 25 to 30 men at work in the district. The mineral belt is about 3 miles long.

LEWIS DISTRICT.

MINING NOTES.—Lander *Free Press*, Oct. 14: The mines are all looking well and a large amount of work is being done. Managers and owners are putting forth their best efforts to crowd the work of development forward. Work in the Starr Orove mine is progressing finely. The lower south drift was extended 57 ft during the month, the upper south 60 ft and the incline shaft sunk 35 ft. Lower levels are yielding the usual amount of good ore which is being reduced at the Eagle and Starr Grove mills. Drift to connect the incline shaft with lower levels has been extended 40 ft and is in good ore. A frame building has been erected over the new boiler, and everything put in shape for winter months. Cloride is looking well and considerable ore being taken out. In the middle tunnel a good body of ore was struck last week. The winze progresses finely and the upper and lower tunnels have been extended rapidly. Eagle—During last month new shaft was sunk 35 ft. Both drifts looking well, and work being vigorously pushed. Highland Chief hoisting works have been completed and are ready to start up, being temporarily delayed for want of a new pump, soon to be supplied. Betty O'Neal—Stoping from lower levels, and hoisting ore that will average $200 to the ton. A new hoiler house has been built and the new boiler is on the ground ready to be set up. The pump and all necessary connections are also on hand, and as soon as the masons can be had the work will be pushed to completion.

MILL BUILDING.—Work on the new 40-stamp mill is going ahead as usual. The boilers, engine, pans and settlers are all set and the stamps are hung up. All that remains to be done is finishing up and putting on the belts. Three or 4 weeks will complete the work. A contract has been let for the building of another 40-stamp mill in Lewis. This time it is the Eagle Co. and the contractors are the same as those putting up the new 40-stamp mill under the agency of J. F. Courter. The site has been located just northeast of the Eagle mill. Work will not probably be commenced on the new structure until spring.

PIOCHE DISTRICT.

DAY CO.—*Herald*, Oct. 15: Following is a synopsis of the official letters of A. S. Gould, superintendent, under dates the 4th and 6th inst.: "Our general outlook continues good as ever. Day—400 level, south drift, advanced 5 ft; total length 55 ft. The entire face in excellent ore; 540 level sunk 4 ft north winze; total depth winze, 52 ft; bottom in spar and lime; 620 level driven 14 ft; total length 24 ft; upper portion of face in good vein matter; station cut out and still sinking—open country—fissures and seams. Ore house full and teams hauling daily. Mendha.—No material change. About 40 tons ore on the dump; sinking main incline in decomposed lime; have changed course of winze below 84 level, to westward. Will now follow the ore down from top of crossing. The stopes east 70 level are holding out very well indeed. Furnace—Doing splendidly; full supply of ores on dump; bullion product, $272 per ton, 4th inst.; abundance charcoal; machinery in best of order.

SEAMPEDE GAP.—Mines here mostly all doing well and promise to develop into valuable properties. Tom Brown brought in a number of samples from Simpson's prospect during the week from which assays as high as $500 were obtained. The men there engaged in getting out iron ore for the Bullionville Smelting Co. are doing well and have a number of fine ledges. There is a large force of men engaged in prospecting and working at this place.

PUEBLO DISTRICT.

COPPER MINES.—*Silver State*, Oct. 15: J. C. Wear, who owns several copper mines in the Pueblo mountains, northwestern corner of the State of Nevada, is in town. He commenced work on his mines with 4 or 5 men some 3 or 4 weeks ago, and has developed sufficient ore since then to warrant his company in erecting smelting works. There is plenty of wood and water in the vicinity of the mines, and the ore is of a quality that can be easily smelted in a water jacket furnace.

ANTIMONY MINES.—Messrs. Emmous & Jones, of Lovelock, have an antimony mine about 24 miles east of that station, on the eastern slope of the lower Humboldt range. There is said to be large quantities of the ore in sight, and San Francisco men have been examining it, with a view of purchasing the property.

SOLD.—John Robbins has sold the Buckeye and Hawkeye mines in Winnemucca mountain, to New York parties. The purchasers intend to develop the mines at once, and erect works to reduce the ores. Both mines have produced exceedingly rich ores, and are undoubtedly valuable property.

SAFFORD DISTRICT.

THE cold snap of the past few days has driven nearly all the prospectors away from the mines, there being no accommodations to keep them comfortable. An expert, in the interest of George Hearst and Haggin & Tevis, has been examining the Onondaga, and left the district last night for San Francisco, carrying with him ore from various parts of the mine. He expressed himself very well pleased with the appearance of the property, which now has a 50-foot tunnel on the ledge, and cross cuts that show up finely. The Contention mine, owned by the railroad boys, has a shaft of 20 ft, and the ledge is said to appear very bold. The first lumber for the camp arrived last Sunday, and a cabin has since been erected at the mines.

ARIZONA.

TOMBSTONE DISTRICT- ORANO CENTRAL.—*Epitaph*, Oct. 16: Sinking has been resumed on old shaft now down over 500 ft—new down 370 ft. Drifts and cross cuts being run actively. The stopes throughout the mine are all looking well, and the usual amount of ore is daily shipped.

GOODENOUGH.—The large ore body recently uncovered here, extending from the 200 level to the surface, will be thoroughly opened. Shaft No. 2, on the West Side, is down 127 ft, the drifts from the same making good progress. A shaft No. 1 the drifts are being driven ahead as rapidly as possible. The usual amount of ore is shipped daily. Machinery at the mill and mine is working satisfactorily.

CONTENTION.—Throughout this mine the work of development is being pushed ahead with the usual vigor, most of the labor, however, being carried below the 200 level. This company have paid their monthly dividend of $75,000; making for this year $675,000 paid to the shareholders.

VIZINA CON.—The depth of the shaft is about 425 ft, the bottom being in favorable looking vein matter yielding small assays, and nothing is more probable than that ore may be soon met with. The shipment of ore has been reduced to about 500 tons a month, which averages fully $100 per ton, the run of 612 tons last month returning $70,000, or a fraction over $114 per ton. The returns from 500 tons will pay all expenses and leave a handsome surplus for the future.

HEAD CENTER.—Most of the work performed here is above the 400 level, on the north end, the injunction of the Contention stopping all work in the southern portion. An upraise has been made from the 100 level to the surface, following the east vein. This was run for the purpose of demonstrating that the vein mentioned has its croppings within the boundaries of the mine. The stopes and winzes are looking well, and about 37 tons of ore are shipped to mill daily.

PROMPTER.—Incline shaft down about 200 ft, the ledge having increased considerably and improved in quality. In a short time crosscuts will be run and the ore body fully opened up, when a better estimate may be made of its value. Suitable machinery will soon be erected.

PENN.—Incline shaft down about 115 ft, showing considerable improvement in the quality of the ore. Altogether the indications are much better.

RUEY.—Vertical shaft down about 112 ft. Some very good ore is being extracted, but in small quantities. No crosscuts have yet been started.

TRANQUILITY.—Started up last evening. It is expected the Contentment will soon follow.

GLOBE COPPER.—The Carrie Copper Mining Co's. smelter at Globe started up on the 27th of Sept., and except for a few hours' delay on account of their pumps, has been running successfully since. They turn out an average of 1,000 lbs of copper every 2 hours, more or less, according to the grade of ore they are handling. The furnace is run with 3 shifts of men, and the company intend to keep it running right along, which they will have no difficulty in doing as there are ample reserves of good ore in sight at their mines.

COLORADO.

ABOUT LEADVILLE.—*Index*, Oct. 14: The reports of the smelters show about 35,000 tons of ore stored in the ore bins and piled up on the premises of the various smelters and mills. The producers are wondering where all the ore came from, while the smelting men all appear independent, and talk indifferent when asked to bid on ore, unless of a most desirable character. The amount on hand is more than equal to an entire month's output. The difficulty with water in the face of the Belden incline has been increasing, and steps are being taken to obviate the trouble. The water pipe for the State Line mines are expected to arrive at their destination by October 20th. The Battle Mountain Smelting company has begun the erection of the frame for the building of its new reduction works. The structure will be 80 feet square and enclose 2 furnaces, with an aggregate capacity of about 80 tons in 24 hours.

TEN MILE DISTRICT.—The Delaware mine is reported to have been sold at a high figure. The Ida L. mine is improving rapidly, and yielding fine galena and copper ore. The Greer smelter at Kokomo is in blast, and making bids for the ore of that district. Work has been resumed on the Blind Secret, Black Bess, St Elmo and Sabbath Rest properties. The Champlain tunnel on Gold hill, now in 400 feet, is to be pushed onward until mineral is struck. The tunnel on the Willie Warner, on Jack mountain, is in nearly 100 ft, and is showing up encouraging results. The Milo mine on Elk mountain, adjoining the Aftermath, is shipping 30 to 40 tons of ore per day. The mine is looking well. Work has been suspended on the Dauntless shaft of the Vermont and Colorado Mining company at a depth of 85 ft. The commodious shaft and ore house at the Michigan mine has been completed, and the new plant is in fine running order. The mine employs about 18 men. The recent discovery of carbonates in the Eagle and Raven mines, on Elk, is thought to insure the future of the properties and place them on a large and steady-producing basis. A shaft 5x14 ft in the clear is being sunk on the Cleveland, one of the claims on the Frentis group on Elk mountain. In addition to the strike in the Champion tunnel, another important discovery has been made in the little Minnie lode, on Sheep mountain, near the Wheel of Fortune.

DAKOTA.

RAILROAD.—The material for the Homestake railroad is coming in rapidly. Ten miles is already down, and in a short time the entire line will be in operation. This company has been the mainstay of the country; they have built the largest mills on the continent; given employment to a large number of men, who, but for their works, would have had no work; developed the mines and have proven in spite of the croakers and testimony of so-called experts, that our leads are genuine and permanent.

IDAHO.

WOOD RIVER COUNTRY—YANKEE FORK.—*Herald*, Oct. 15: Locations are still being made on the Liberty, on Squaw creek, and they all show up finely. Quite a number of prospectors are digging up the country, and a good many more finds will no doubt be recorded before winter. If depth reveals as rich and extensive ore bodies as have been exposed at the surface, a smelter will be put up next year. The ore is rich in copper, to say nothing of the silver. The Garfield, on Henry creek, is being developed by Ralph Goodliffe and the Bayhouse Brothers. S. K. Goldtrap has put 4 men to work on the Liberty mine, on Squaw creek. The Elmira company is putting in a steam pump to raise water out of the lower level of the Crown Point. The water will be conveyed through the lower and main tunnel, 35 ft below which work is now being carried on. A 3-ft seam of bluish colored ore was struck the other day in the drift running west from the 75-ft level in the Sub Rosa. It is the same character of ore that was mined several years ago near the surface, 000 tons of which milled between $25 and $30 per ton. The ore of this last strike will turn out about $20 per ton. Thirty tons of ore are on the dump of the Sub Rosa. A force of ten men are at work in the Ebenezer. Sixty tons of ore are on the dump, and as soon as 40 more are extracted it will be crushed in the Gold Hill mill. The lower tunnel of the Sub Rosa is in 375 ft, and it is expected the vein will be tapped by it soon. John and Fred Frank are taking out a crushing of ore from the Tidal Wave, which will be reduced in the Sub Rosa mill.

SAW TOOTH CITY is quite lively, and a number of new buildings are in course of erection. Seventy-five men are employed at the Columbia and Beaver mill. A new mill has been ordered for Smiley gulch.

MONTANA.

BUTTE DISTRICT—ALICE MINE.—*Inter-Mountain*, Oct. 14: On all the levels extraction of ore is proceeding as usual, and on the 2d, 3d, and 7th the drifts are being forwarded. The quality of the ore throughout the mine is good enough to insure handsome profits, and the amount so large that sinking for the 800 level will not be started for some time.

MOULTON.—Seven hundred tons of ore on the dump, sufficient to last the mill three weeks. Explorations are progressing vigorously, and every part of the mine looking wonderfully well.

BELL.—Appearance of ore unchanged, a profusion of native and wire silver visible on almost every piece extracted. The percentage of copper remains at from 40 to 60. Smelter rapidly approaching completion.

LEXINGTON.—No important developments the past week. Until the 200-ft north crosscut taps the main vein operations in the old workings will not be resumed on account of water. The main shaft, of 240 ft. deep, and sinking progressing.

ITEMS.—Two carloads of matte from Butte arrived in Ogden on Thursday. The erection of the Bruckner cylinder began in the Alice mill this morning. Bullion shipments from Butte for the week ending Oct. 15th, aggregate $57,870 20. The strike of the Colusa holds out in good shape, the silver value of the ore being much higher than was expected. The shaft of the Butte Original has reached a depth of 200 ft and stations are now being cut for the 100 and 200 ft south crosscut.

NEW MEXICO.

MOGOLLONS.—*New Southwest*, Oct 15: On the Silver Bar work is being pushed rapidly. Capt. McAllister, one of the pioneers of the camp, has taken a contract to run the lower tunnel 80 ft farther, so as to strike the junction of the upper and lower leads at a depth of 500 ft. A 20 ft shaft is being sunk on the new lead 80 ft from the point of connection with the old lead. The mineral increases in value as the work goes on. The character of the ore on the new lead which is 4 ft wide is mostly gold, but also a large percentage of silver. It has been found, discovered by assay, that about 10,000 tons of surface rock hitherto considered valueless, are rich in both gold and silver free milling ore.

PLACER MINING.—A large number of men are making good wages at placer mining a few miles from Silver City, in different gulches. Should the rains continue this will remain one of the paying industries of this section of Graut county for some time to come.

OREGON.

QUARTZ DISCOVERED.—*Dalles Times*, Oct 15. Quartz lodes of apparent value have lately been found in the Eagle Creek mountains, in Union and Baker counties, about 35 miles east of Union. The St. Elmo runs from $12 to $200 to the ton in gold and silver; the Badger will "mill" from $6 to $31 to the ton. These are well defined ledges and easy of access. The "Badger" is close to the surface, and can be distinctly traced for a long distance. The St. Elmo can be readily seen cropping out for a distance of 9,000 ft. About 20 miles distant from these quartz ledges, across Snake river, in Idaho, is a bit of country rich in galena, copper and iron, and the former metals have mixed with them large quantities of gold and silver. The iron is contained in a solid mountain, all of which will assay about 80% of that metal. This country is situated directly on the proposed line of railroad down Snake river, which, if built, will furnish a means of shipment for these valuable ores.

UTAH.

PARK CITY.—Salt Lake *Tribune*, Oct. 17: The Pinyon is shipping about 15 tons of ore per day to the Salt Lake smelters. A strike may be looked for in the Utah before long. The crosscut is now nearing the vein. Recent development in the different mines on Pinyon hill are showing up large bodies of ore, and tunnels, shafts, or drifts, in whatever direction run, cut right into it.

SILVER REEF.—*Miner*, Oct. 8: So far as we can learn, there is nothing in the mines but prosperity to note. The promising condition of the different properties is shown clearly in the impetus given to all branches of business, and the qualities of merchandise and mining supplies being received daily by the merchants and companies is far exceeding any previous average. The Stormont Co. makes a deserving record, and from the official reports we condense the following: Total bullion shipment from July 6th (the date of resumption at the mill) to Sept. 30th inclusive, $93,821.68—or an average of about $32,000 per month. The surplus of this amount over and above expenses and dividends has been largely used by the management in prospecting the property and placing the mine in its present productive condition. The ore bodies now uncovered and yielding treasure are estimated of sufficient scope to furnish product for at least 6 months' run of their stamps. No less than 3,000 ft of direct levels and winzes have been driven since the date of resumption. The Barbee & Walker can also make an exhibit that speaks well for the merits of its mine and mill capacity, and management. We find the official figures to show the following gratifying result: Total bullion product from July 17th (date of mill resume) to Sept. 30th, $72,958.21, which makes a grand average for the actual running time of 66 days (deducting 9 days stoppage for repairs to engine) of $1,105.42 per day, or $33,192.60 per month.

Sulphur in Ores.

At the meeting of the Polytechnic Association of the American Institnte, on Septemhsr 15th, Mr. N. S. Keitb, opening the regular subject of tbe evening, explained the difference hetween volatilizetion and burning of the enlphur in ores. There are two atome of sulphur in the sulphurets, one of which ie more easily parted with than the other. A moderate beating drives out one, and it is expelled simply es eulphur, and can he recovered as such. The otber can only be expelled hy a combination with oxygen, in common language hurning, forming eulphurous acid. His experience had heen entirely with tbe ores of tbe precious metals; he bed worked on a large scale end invented improvments, which be described. He had committed the same error in part tbat many others bad of attempting to cerry tbe saving too far. It wae economy to go to great extent in utilizing the waste from silver processes, hecauso the combinations assumed hy silver would otherwise carry off a large proportion, nearly tbe whole, but it was not so with gold.

One of tbe favorite ways to burn the sulpbur from ores wes to pulverize, or rather to crush, finely and sbower it down through a flame of wood or coal. The eulpbur would add to the fuel so tbat little more was required witb some ores. The draugbt would cause some of the finest to blow away. He had arranged eettling chambers, extending a long dietance, to recover tbat dnst; it did not pay.

Mr. D'Heureuse drew end explained a desulpburizing apparatus recently constructed, and now working on a large scale in Brooklyn, a modification of the Stetevelt first described. Instead of using wood or coal these parties used petroleum as tbe fusl to keep up the flame in the tall cbamher. Instead of showering in tbe fine ore hy pessing through rollers it was in thie apparatus passed in with a blast of air.

Mr. D'Heureuse had examined cbemically and microscopically, after thoroughly braying in a mortar, the dust whicb bad passed through this treatment, and found no remaining sulphur. He attacbed importance to the absence of any coating around the particles, which was liable to be found when the ore was hurned witb fuel producing ash.

Artesian Wells in the Black Hills.—Yankton, crippled in business and suffering from a leck of good water, resolved to supply the want by an artesian well. The city contributed liherally, and the result is, their labors bave been crowned with success. To-day they bave an ample supply of tho indispensable fluid. Tbe great trouble in the Hills has been the want of water for mining purposes. Almost daily mills have to hang up tbeir stamps from lack of water. Tbis is a severe loss all around. But a few days ago the tanks of the city were nearly dry. This was caused, it is true, by tbe waste of our citizens; but to replenisb our etock the mills had to shut down, to their loss. Ae a country the Hills ere amply supplied witb water, but for the purposes of mining it is hadly distributed. Many of our great mines, hotb lead and placer, are upon the crests of mountains above the fountains of our streams, or where they are but insignificant rills; the greatest economy has to be exercised in its use. So far as our city and the great mills are concerned we have at the present moment ae mucb es we probably will have from remote sources. All tbe water which can be brougbt in we already have. If mills and menufactories multiply, as tbe demende of the country indicate they will, tbe water supply becomes a serious question. As time passes this want will hecome more pressing. The Hille are being rapidly denuded of timher. As a natural consequence there is less rain. We will at last have to rely upon artesian wells. One sucb equal to tbat at Yankton would amply eupply our mills and perhaps the surrounding cities. The cost of euch a work, driven ae it would have to be tbrough solid rock, would be great, but the result would repay tbe outlay.—*Black Hills Times.*

No Invasion of Possession.—Tbe Supreme Court has rendered a decision wbicb affirms the doctrine that, by Congressional Acts, exprees reservation was made of tbe rights of mining and irrigation ditches in sales of public lands. W. H. Farley had brought suit against the Spring Valley Mining and Irrigation Company in the late District Court of Butte county, to recover damagee for injury to hie 80 acres of land, caneed by their flooding from the company's reservoir. Upon the trial of the caee the plaintiff sbowed tbat be had proved up and paid for the land, claiming that it was part of the public domain even after the company had built and filled its reservoir, which was previoue to hie purchase. A nonsuit was granted, wbicb decision tbe Supreme Court yesterday affirmed, bolding tbat until Farley had "proved up" and paid for the 80 acres, in 1877, Congress bad full power to withdraw the land from sale or to eell it or grant it to another. The Supreme Court holds, furthermore, that the effect of the Act of Congress of July 26, 1866, and of July, 1870, amendatory thereof, is to grant to the company the rigbt to conetruct and uee tbe reservoir and other rights reserved in the patent issued to the plaintiff euhsequently. He was not entitled to judgment, for in the conetruction of the reservoir the company did not injure or damage or in any way invade tbe possession of tbe plaintiff.

A Great Mine.

Thougb we live in what might be termed an exclnsively mining region, yet few of us stop to think relative to the details of expanse necessary to the sucesssful working of e great mine. It is our purpoee to give a few figures in regard to the Tombstone Mill and Mining Company, hotb as to outlay and returns, wbich will doubtless interest the mining public.

This company handle every month 23,000 tons of ore; to convey this ore from the mine to the mill, nine miles distant, it requires six teams, each team hauled by sixteen mules. Each team makes a round trip between tbe mine and tbe mill every day. This company bave in operation tbree hoisting works with an average capacity of 200 tone per day. Tbey bave two mills, one of 20 stamps and one of 15 stamps. Tbe latter (15 etamps) can he run hoth by eteam and water power. At tbe mills and mines of this company 250 men are employed, who receive an average of $4 per day, making the outlay for labor alone, eacb day, $1,000. The average shipment of bullion per month bas been $120,000 for the eix months last past. Tbe ore is boisted hy power and carried on tramways to ore bins, which are so constructed that ore teams are driven immediately underneatb the hins, and a trap door opened through which the ore passes to the wagon-bed beneath. At eacb of these bins are assorting floors, where the ore is carefully separated from tbe waste. Tbe eurface ground of thie company's mines covers an area of 169 acres. The Tombstone Mill and Mining Company have disbursed, since operations commenced in 1879, tbe sum of $850,000 in dividends, bsing one out of only twenty-five mines, in the bistory of mining in tbe United States, wbicb has dishursed that amount. The first bullion was produced in October, 1879. It was tbe first mine opened in Tombstone District—huilt tbe first mill, milled the first ore, produced tbe first dividend and has continually paid dividends from that time to this.

The bullion ie shipped to San Francisco and sold to the United States Mint. A branch mint sbould be established in Arizona. The number of hnllion-producing mines now in operation within the limits of tbe Territory, together with those which will within the coming year he bullion producers, must force upon the Federal Government our claims for a mint. The effort to create a market here for the purchese of Mexican coin, to re-mint it, is in direct opposition to the interests of bullion-producing mines in Arizona, as it would he bringing foreign bullion in competition with our home product. We trust our delegate to Congress will not forget a hranch mint for Arizona. Trnsting our readers will excuse this diversion, relative to a branch mint, we return to the Tombstoue Mill and Miniug Company, and propose to say a few words in regard to the operation of mines by Eastern capital, it baving heen tbe bahit of many in our Territory to criticise eeverely Eastern capitalists and their mauagement of mines. These minee have heen worked by Eastern capital exclusively, from first to last, requiring the ontlay of large sums of money, but they have been successfully operated, and we venture the assertion that when the property is good, Eastern capital will not he lacking to develop and forward it to a dividend-paying mine. The operations of this mining compauy are carried on by Prof. John A. Church, Superintendent; James Kirk, Foreman in mines; S. W. Wood, Manager at the mills; D. McCarty, Assayer.—*Arizona Journal.*

The Belmont Mining Company's New Furnace.—Tbe Belmont mining compeny has purchesed a new roaster called the Pacific Improved Chloridizing Furnace. This is a new style of charging furnace—an improvement on what is commonly known ae the Bruckner Cylinder. For gold eulpburets or very hase silver oree it is regarded hy many as the most eimple and moet effective furnace in uee. The ore is at all timee under perfect control, and the charges can be run any length of time until in proper condition to be drawn, tbue making it peculiarly adapted to all classes and conditione of base ores. The hoppers hold a full charge, and only five minutes are required for charging tbe cylinder. To discharge it, tho cylinder ie run about thirty minutes with the doors open. The amount of ore they will handle per day of course depends upon the length of time required for eacb charge, whicb averages all the way from five to fifteen hours. Four of tbem bave heen in operation at the White & Shiloh mine in Nevada for the past two yeare, working witb great economy and eatisfaction, the hasest oree in this State, up to an average of over 90 per cent. After a long series of experimente the mecbanical conetruction has been brought to such a degree of perfection tbat no lose or annoyance is experienced in the way of etoppage for repaire.—*Belmont Courier.*

A New Motor.—A German paper describes a new motor which is eaid to he driven by a new force more powerful thau eteam, which has the additional adavantage that it can be generated in ahout hve minutes, without the aid of fire or water, to attain a preesure of 10 atmoepberee without emitting any noxious vapors. The particular machine is rated at 2 boree-power, while occupying a epace of hut 11⅔ cu. ft., and weighs, with tbe motive power, but 330 lbs. We sbonld be glad to eee it.

The New Mines on the Mojave.

How to Get There, and all About Them

The newly discovered mining region on the east of us, in tbe county of San Bernardino, is at tbis time attracting a great deal of attention, not only from the citizens of these two counties, hut from mining men and opsrators elsewhere, who make it a business to look after and examine into all the newest and latest discoveries. For the purpose of getting, as far as possihle, an intelligent description of the situation of tbese districts and the mode of getting to them, we present the following particulars just gatbered by one of our reporters just returned from a tour of observation in that region:

The Oro Grando district is eituated on the Mojave river, about 80 miles from this city, or about 40 milee from the towu of San Bernardino. From the town of Oro Grande, tbe road leads down the Mojave river ahout 30 miles to Grapevine etation, situated on tbe north hank of the Mojave river, where there is a trading-post and where accommodations can be had for man and animals. Tbie is in the Grapevine mining district, and immediately north of the station, about three miles distent, is eituated tbe now celebrated Waterman mine, together witb many other later locations, which have not, as yet, been prospected sufficiently to prove their value or importance. The Waterman company is building a 10-stamp mill, and other improvemeuts on the river ahove, about one mile, where there will be a store, boarding-honse, etc. East of Grapevine etation, abont six miles, on the Mojave river, is Fish Pond station, long used as a stopping place on the Fort Mojave and Ivanpah road. Ahout ssven miles northeast of Fish Pond etation is eituated the Calico mountain, upon which the Silver King, Burning Moscow and Oriental claims are located, on the soutbeasterly portion of the same; the Burning Moscow being considered the nortbwestern end the Oriental the southwestern continuation of the King lode. Calico mountain is a low mountain not of any great extent, and several locations round and about tbe portion discovered, and on the nortbern portions of the mountain, are considered by the locators to be of great promise; but it will require labor and capital to develop their intrinsic value. Ahout one and a half miles from the Silver King mine, on what is known as the Dry Lake, on the road leading from Fisb Pond to Calico mountain, a well bas been sunk, and at tbe depth of 80 ft. an ahundant supply of water is obtained.

The different mining camps in and about there are being supplied therefrom. Ahout midway between the hill or mountain on which the Waterman mine is located, and Calico mountain, ie a low hill known as "Black mountain," upon which some very promising locations have heen made. Notices and monuments ars plentiful everywhere, and the number of locatioue made in all parts of the district are innumerable, it appearing that parties have located everything that bas any appearance or resemblance of a ledge, for the purpose of taking tbe chances, without any desire or idea of doing auy work upon their locations, but waiting to see what the futnre may bring forth. It is hard to estimate the number of men at work or prospecting in the district as they are scattered here, there and everywhere, hut the aggregate number is larger than one not acquainted here would suppose. Prospecting parties are branching out in all directions, north, eoutb, east and west, prospecting in every range tbat can he reached. But this mode of prospecting is limited to tbose wbo have teams to haul water, as that necessary article is exceedingly scarce in that region, except in tbe immediate vicinity of the river. Several promising new diecoveries are already reported, and now that tbe summer season is over otbers may he looked for at any time, as it now appears that each and every range of mountains conteins ledges of greater or less richness or extent. To the east of Calico mountain about 120 milee distant and ahout 20 miles eouth of the road leading to Fort Morgan, ie situated tbe Trojan district, in Providence mountain, where Gillette & Co. bave lately purchased the mines loceted hy McFarlane, Osborne and others, for $300,000. Many loaded teame were met on the road with freight for the last named district, whicb sbowe that active operations are now going on in that direction. In short, there is great activity in mining matters through that entire region, and there is no douht of the richnese of the surface prospects. Much of the rock ie fahulouely rich, and if it continuee to hold out—if it poseesees permanence—if there is only enough of it—it will certainly prove one of the leading mining regions of the Pacific coast and add greatly to the wealtb and business reeources of southern California.—*Los Angeles Herald.*

Russian Mineral Statistics.—The Rneeian report on mineral etatistics for 1879, whicb hae juet been publiehed, givee tbe yield of gold in Russia for that year at 42.5 tone; eilver, 11.2 tons; platinum, 2.2 tons; zinc, 4,250 tons; copper, 3,074 tons; lead, 1,335 tons; pig iron, 479,865 tons; coal, 2,872,367 tons; crude petrolenm, 346,274 tone.

The Gold Supply.—Tbe supply of gold in tbe United States hae been increased to the amount of $175,000,000 during tbe last two years, exclusive of the home prodnction. This great drain of the precious metals from Europe is the cause of the late advance in interest, in all tho money markets of that contiuent.

Demand for Quartz.—It seems that tbere is a scarcity of gold quartz in San Francisco, and the manufacturere of quartz jswelry cannot supply the demand, owing to lack of material. Through the kindness of Mr. A. Howard, the leading jeweler in this city, we are permitted to take extracts from a letter received hy him from one of the largest manufacturing firms on this coast. The firm says: "We notice in the *Mercury* that fine specimens of gold quartz are heing brought into your city from mines near by. Gold quartz is getting very scarce now, in thie city, and we have tried Nevada City and Grass Valley, and are unable to ohtain any. If you can send us some quartz for cutting, we will pay from $20 to $25 per ounce for the gold tbat is in it. Should you be able to get eome nice black quartz, we will pay $30 per ounce. In sending pieces from different partiss you can number them, and we will let you know how much they are worth, and if the parties are not satisfied we will pay expressage hotb ways. Any colored quartz will do—white, gray, or black; the only thiug required is that gold must be seen from tbe outside. You have no idea how mucb we want quartz. I bave written more than 10 letters to Nevada City, and only got a small piece. I wonder if you will be able to do anything toward getting me some." Here is a chance for some of our quartz men to make some money. Hardly a week passes that our attention is not called to a fine specimen full of free gold. Only last week a miner struck it rich, and gave away to bis many friends at least two dozen specimens of just the kind of quartz that these gentlemen are willing to pay $25 an ounce for. Of course there are not many claims that show up free gold in any great quantity, hut still, pockets are being struck, and beautiful specimens taken out.—*Oroville Mercury.*

River Mining.—Old and experienced miners, says the Yreka *Journal*, consider that the hest way to make river mining successful is to prospect by sinking a sheft as in quartz and placer mining, using a good pump run hy river power to keep the water out while going down. This metbod would certainly make a suro thing on securing good pay for tbe erection of extensive machinery and apparatus, if good prospects are obtained. Tho extent of richness of the bedrock gravel, and the deptb to go down from tbe surface, could allow easy figuring as to the probahle succese in drifting or making an open cut. It is believed that many of the river claims would pay hetter by drifting, in plece of so much dead work to uucover the eurface or non-paying top dirt, especially where 40 or 50 ft. must be removed with the hardeet kind of labor and scientific skill, and so many huge bowldere exist. Besides, the work of drifting might be prosecuted all the year round, if the drifts are run in a secure and substantial manner by extensive and thorough timhering. In the present method of wingdamming and making open cuts, the same work has to he renewed every season, leaving but a very short time for hedrock cleaning hetween the time tbey reach bedrock and the commencement of the winter with heavy rains to flood them out.

New Gold Separator.—The Ferndele *Enterprise*, Humboldt county, dcscribes the following gold separator, an invention of that vicinity, in the language of the inventor: "I conetruct a round cone, the point uppsrmost, the side of the cone sloping to snch an angle as to give the sand and water the proper velocity. Through a common sluice-box I cause sand and water to flow on to the top or point of the oone; here it ie spread and diffused by the constantly increasing size of cone downwards, until at the lower part of the cone it will he a mere film of separate grains of saud. Tbe lower part of the cone will be covered by quicksilver plates, and there will be quicksilver in suitable riffles. The sand containing the gold can, by this means, he forced, every particle of it to come in actual contact with tbs quicksilver, and the gold, where not coated hy rust or by some oily substance, must adhere and form an amalgam."

A Wagon that Carried 4,500 Tons of Gold.—The little old "gold wagon" in New York that carried gold from the Custom Honse to the Snb Treasury has heen put aside. Sometimes it made as many as a dozen tripe daily, carrying as much as $80,000 in glittering gold coin each time. The money ie usually put up in bage of $20,000 cach, whicb are placed in heavy oaken boxes witb maseive rod iron handles. These hoxee are then put into the wagon-box, and a lid witb clainps of iron ie locked down over it. The wagon is pushed like a hand-cart hy two Cuetom House porters, accompanied by an armed watchman, whoee duty it is to see tbat tbe load ie not interfered with hy thieves. The little ueed-up wagon has carried in its time prohably not lese than $500,000,000, or abont 4,500 tons weight in gold.

Two "ecientiete" of Colorado are quarreling about the priority of the invention for the extraction of the precious metals from qnartz without mining it. They melt out the metale hy melting down the monntaine; or at least claim to he ahle so to do, having met witb "snccess on a emall ecale." Probably hy melting molehills.

Simplyfying the Steam Engine.—A French patent ie to make tbe engine with the feweet numher of parts. The cylinder and piston are hoth made of only two pieces holted together in the middle, the crank-pin works in a hlock which elides hackward and forward in a slot, and the valve ie driven from the emall crank.

Stealing Specimens.

The Nevada *Transcript* says: Most mining companies whose ledges contain what is known as "specimen ore" sustain heavy losses through the tricks of dishonest employes. Numerous cases are reported here in Nevada county where miners working for $3 a day, and supporting large families, have accumulated wealth with such remarkable rapidity that in a very few years they have been enabled to retire from the field of active labor and live on the fat of the land, and this when it was positively known they had not been dealing in stocks.

The "tricks of the trade" are numerous, and in view of recent happenings it may not be amiss to describe some that are connected with the history of gold mining in this locality.

One trusted employe of a well known company that frequently developed "pockets" in the course of its operations had a practice of lighting his tobacco pipe every time he was coming off shift, and enjoying a smoke as he rode to the surface and walked homeward. The pipe had a bowl that held almost a handful of tobacco, but despite this extravagance the man, in addition to having a snug bank account, lived in good style, dressed his family nicely and gave his children quite an expensive education. How he could do so much on $3 a day was a mystery for several years. Finally, one morning, as he stepped into the dry-room after ascending to the surface, the bowl of his pipe separated from the stem and fell to the floor. The Superintendent of the mine happened to be there, and it rolled to his feet. He courteously stooped to recover it for the owner. As he did so he observed it was very heavy, and turned it over in his hand with curiosity. The miner saw the motion and got nervous. The Superintendent noticed the peculiar action of the miner, and a ray of suspicion entered his not over-astute mind. He walked out of the room with the pipe, leaving the miner in a greatly excited condition. When he got to his office he made an examination. In the bowl he found a rich specimen covered by a thin layer of tobacco. The smoker never worked in that mine again.

A miner who had always enjoyed a spotless reputation for being upright and industrious, went to a Grass Valley physician some years ago to be treated for what the patient claimed was "blind piles." An examination of the case showed that the patient's only chance for recovery was to submit to a surgical operation. The operation was performed, and a ragged chunk of gold was found in the anus. The man died, thus paying the penalty of his dishonesty.

Another instance was where a miner, who was regarded as eccentric because he let his hair grow nearly to his shoulders, used shoemaker's wax to fasten specimens close to the roots of the hirsute covering, and he is supposed to have carried on the robberies for some years before being detected.

Another was the object of frequent jests because of the size of his nose in the vicinity of its bridge. The nostrils were contracted at the outlet, and expanded as they went upwards. It was not until some one finally detected him in smuggling nuggets out of the mine by putting them in his nostrils that the advantage of such a nose was appreciated by his fellow-workmen.

A dentist in this city had a call from a miner who was suffering with the toothache. While examining the offending ivory, which was a hollow one, he prized out a small piece of quartz heavily charged with gold. He accepted it as pay for his work and considered himself well remunerated. It is probably unnecessary to add that the quartz was not put there by a dentist.

There are other dodges daily resorted to by specimen thieves. The cases we have referred to are those of quartz miners. Some day we will tell how the owners of gravel claims are robbed.

Vest Pocket Assays.—How strange it is for miners to salt their mines on themselves! Miners will open their prospect holes, put a piece of rock in their pocket as big as a walnut, get a big assay, then show it around, telling everybody they have from two to four feet of such material—tell it until they appear to believe it themselves. But when they finally conclude to get a mill-run, they shovel up their dump, get a run, and it goes, say, 20 ounces; they denounce the mill men. What nonsense! Now, miners, do you know that 50 ounces is above the average of milling ore in all mining countries, and that a pay streak of four inches is a good average vein? If you have only a little rich ore sort it carefully and take it to the nearest ore market. Men on the hunt for mining investments look around the smelters. A few sacks of fine ore in a smelter beat a heap of wind puffs. Suppose you have only a few hundred pounds; get up your jack, pack it over, get your money, he it ever so little; keep to work. One worked mine is worth a dozen idle prospects. You will never sell by standing idly by and blowing about your $50,000. Get in your ore; then you will have some good sales.—*Gothic Miner.*

People should avoid, as far as possible, being run over by railroad cars. An empty platform car weighs 18,000 lbs.; an empty box car, 20,000 lbs.; a passenger car, 36,000 lbs. and sometimes more; and an average locomotive, 80,000 lbs.; a single pair of car wheels, 500 lbs.

Useful Information.

A Peculiar Property of Gutta-percha.

It is a well-known fact that when gutta-percha is placed in water having a temperature of 60° to 70° C., it becomes very plastic, and may be used to receive very delicate impressions. Not so well known, however, is the information that the softened gutta-percha becomes very elastic toward severe shocks, that it will bear blows from large hammers, and allow itself to be thrown against a strong wall without showing any indication of the result, while at the same time it is so susceptible to gentle pressure that it is capable of receiving the slightest of impressions.

This peculiar property is possessed by other plastic bodies though in a less degree, as, for instance, freshly kneaded bread. It is considered as resulting in consequence of the occluded air contained in the substance.

The following simple experiment demonstrates the correctness of the above suggestion: Two spheres of equal weight are made of gutta-percha which has been softened in water at 70° between the palms of the hand. One of these is placed on a card, and the air removed from the sphere by exhausting it under the receiver of an air pump; the other is retained for comparison. Both spheres, from their weight, will assume the form of round cakes, but the one under the air pump will swell considerably and exhibit a wrinkled surface. The increase in volume often more than doubles its original size. If the swollen piece is permitted to harden under the receiver of the air pump and then broken with a chisel, its close section will appear honeycombed like the interior of a loaf of bread, while the fracture of the other pieces will only show small cavities. Very dense gutta-percha does not swell under the air pump, but if placed under mineral oil and made empty a voluminous evolution of air from the gutta-percha will take place.

After the air is again admitted under the receiver it will be found on examining the gutta-percha that it has lost the property of hardening on cooling. It has become like tough, greasy leather. A voluminous evolution of air was also observed when clay, putty and kneaded bread were examined under oil in vacuo similar to the above described treatment of gutta-percha.

The same phenomenon was observed when a sample of gutta-percha, which had been softened in an air bath, was treated as above; in this case a longer time is required for the heating, as the heated air is very slow in giving the amount of required heat.

With some bodies the enclosed air plays an important part in affecting their mechanical properties—thus clay, for instance, may be somewhat compressed by means of a piston in a cylinder; but as soon as the pressure ceases, it resumes its former volume.

The densest clay, when placed under the air pump, will become covered with numerous fine crevices (small as hair), which close up when the vacuum is sufficiently reduced.—*Dingler's Polytechnis.*

To Cover Wire with Gutta-percha.—The *Mechanical World* gives the following as an easy method for covering copper wire with gutta-percha for electrical purposes: Some commercial gutta-percha cut into small pieces is introduced in a bottle containing sulphide of carbon; this bottle must be well stopped. If agitated from time to time it dissolves at the ordinary temperature. When completely dissolved it is left to stand some days, until the impure matters deposit at the bottom. It is then poured into another bottle, which is also kept well stopped and at a low temperature; for thick wire the solution must be concentrated. The wire being dipped in this solution, the sulphide of carbon, evaporating, leaves on the surface a layer of gutta-percha more or less thick. In order to operate continuously, the solution is poured into a V tube, through which the wire is passed over a wooden pulley. The distance between the tube and the bobbin upon which the wire is rolled is about ten yards. In order that the sulphide of carbon may evaporate, this operation should be carried on in the open air.

Staining and Matching.—To stain mahogany a dark color, dissolve bichromate of potash in warm water, and apply it to the parts to be stained; it can be made weak by adding water, and the learner should use it weak at first, or he may make his work to dark; when dry, paper down. A little red sanders used in the polish makes it a bright red color and improves the staining; this stain is used in matching mahogany work that has been repaired. If the work is not required to be very dark, a little red sandera mixed in the polish will be sufficient. This is likewise used for birch or any wood that is used to imitate mahogany.

Oil on Woodwork. — Carefully conducted experiments have demonstrated the fact that seasoned wood, well saturated with oil when put together, will not shrink in the driest weather. Wheels have been known to run many years, even to wearing out the tires. Very many dollars might be saved annually if this practice were adopted. Boiled linseed oil is the best for general use, although it is now known that crude petroleum on even old wheels is of great benefit.—*Young Scientist.*

"Rough on Rats."

In every drug store in the land are seen placards bearing the inscription "Rough on Rats." Do the people know that this preparation thus advertised is just as rough on human beings? A chemical examination shows that it consists principally of *arsenious acid*, a deadly poison. Recently we have word from New Orleans of a whole family poisoned by this dangerous substance. Druggists in most States are prohibited from selling arsenic without plainly labeling it "*Poison*," and taking great care to keep it from the ignorant and careless, but here is *arsenic* sent into every house with no precaution whatever. Is there not need of some regulations in these matters? Arsenic sells at *wholesale* at from *one* to *two* cents a pound. Rough on Rats at 15 cents an ounce. Quite a fair percent of profit.

There is another form of arsenic sold in the drug stores with no warning. It is "cobalt" or fly poison. Cobalt is only a soluble form of arsenic, and being soluble, is really more dangerous than common arsenic. But do the people know this?

Paris green is still another deadly form of arsenic, in reality a compound of arsenic and copper, both of which are poisonous. In the fluids of the alimentary canal, Paris green readily dissolves and rapidly proves fatal.

Owing to its cheapness and the brilliant colored compounds which this drug forms, arsenic is used in great quantities in hundreds of places where it would never be suspected. It is found in wall paper, paints, calico, rubber nipples, confectionery, colored crayons, glass, glazing materials, etc. Strange as it may appear, arsenic is used in some countries as food.—*Science and Health.*

A Vast Lead Field.—The upper Mississippi lead fields include 2,000,000 acres—200,000 in Iowa, 400,000 in northern Illinois, and 1,400,000 in Wisconsin. The value of the gross amount of lead produced in that field since 1826, is about $70,000,000.

Compressed gunpowder experiments have been made with compressed gunpowder, made to fit the drill holes and cut into short lengths. It was found to possess many advantages over loose powder, among which is a saving of 40% in powder.

Good Health.

Concerning Mountain Cures.

There is one feature connected with mountain cures which should not be overlooked. There are, speaking broadly, two classes of persons to whom the mountains offer health. One class comprises those who have been overworked in the city, whose lungs, digestive organs, eyes, etc., are out of order, and want air and exercise. This class of persons, we may say at once, could get cured as well on a plain or on the sea as in the mountains, so long as they get air and exercise. But there is another class to whom the mountains offer special advantages. They are afflicted with a kind of phthisis which needs bracing, rare, stimulating, dry air. To go to Colorado, New Mexico or Arizona is new life to them. But cures of this character are conditional. A young man left Philadelphia for Minnesota some time ago in an almost hopeless condition, and in a short time his constitution was built up by the new air. The most biting cold of the Minnesota winter did not harm him. He wanted to exhibit his health to his Philadelphia friends, but a return to the City of Brotherly Love brought back all his old alarming symptoms. He had to flee to Minnesota again, where he once more found perfect health. Then he took a trip to the far West. But at San Francisco his old trouble returned. We repeat—the man who wants air and exercise and goes to the mountains, where he recuperates, is different from the man who needs air of a peculiar kind to aid him in warding off consumption. This latter, when he gets where he finds vitality in the air, must follow the advice Sumner gave to Stanton, in that expressive word "stick."—*Herald of Health.*

Death from Pricking a Sore.—Recently a young married lady of Albany died in the Adirondacks under circumstances of the most singular nature. Before going out driving she pricked with a brass pin a cold sore on her upper lip, and rubbed it with camphor. Before she reached her hotel her lip commenced to swell, and before night her face was swollen to an abnormal size. Her husband was telegraphed for and arrived before the unfortunate lady died, but she could not speak to him, such was the condition of her face. Erysipelas had set in of the most virulent type, and death resulted within 48 hours.

To Remove a Finger Ring.—Thread a needle with a strong thread; pass the head of the needle, with care, under the ring, and pull the thread through a few inches toward the hand; wrap the long end of the thread tightly around the finger, regularly all down to the nail, to reduce its size. Then lay hold of the short end of the thread and unwind it. The thread pressing against the ring will gradually remove it from the finger. This simple method will remove a very tight ring without difficulty.

Civilization and Health.

Is the human race deteriorating, physically? In other words, is civilization a shortener of life, or otherwise? Although much may be said for the haleness and heartiness of our grandfathers' and much against the pale, slim, city-bred dyspeptic, yet we cannot but come to the conclusion that the race is not in so sorry a plight as some people would judge.

Among savages life is short, and it is the exception for a man to attain to 50 years, while long before that his powers are decayed. Then, too, in the records of English courts, from the 13th to 16th century, Sir Thomas Hardy found no instance of a man who had survived his 80th year, and the age of 70 was rarely reached, and was regarded as extreme.

The advance in medical knowledge, the spread of education and sanitary improvements have, taken together, had a great effect in adding to the average of men's lives. It is true we see certain unwelcome signs of decay, notably in the teeth of the present generation; but these are the result of local causes which, it may be hoped, will disappear in course of time. Railroads and steamships do much, indirectly, to benefit the race constitutionally, in bringing together to this country hardy representatives of other races. The intermixture of blood which is the result cannot but exert a highly beneficial result on this nation. In this matter we are, as a people, highly favored, and the time may be looked for when Americans will stand out before the world, more even than now, as one of the healthiest nations extant.—*Herald of Health.*

An Anti-Vaccinator's Fate.—Possibly the bitterest opponent of vaccination may be impressed by the grim details of the story which was told and discussed by the Rotherhithe Vestry on Tuesday. A person in the locality had made himself conspicuous for many years as a vehement anti-vaccinator, and had ingeniously succeeded in evading the act, so that no members of his family were vaccinated. A couple of months back one of this man's children took small-pox. No doctor was called in, but the child was nursed by its mother and recovered. Then the mother herself took small-pox and died, after which two more of the children fell victims to the disease, and three more had to be taken to the hospital. Bad though this was, there was more to come, if the story told at the vestry be true. The anti-vaccinationist borrowed from a neighbor a suit of black clothes to wear at his wife's funeral. He kept the clothes in his house a few days before returning them. Shortly after their return their owner also took the small-pox, was conveyed to the hospital and died there. Since then several houses in the same neighborhood have become infected, and some sixteen cases of small-pox have been taken to the hospital. Commentary on such a case is needless. The liberty of the individual is sacred so long as it does not infringe on the liberty of some one else. If anti-vaccinationists only did harm to themselves no one would have a right to interfere with their fancies; but when their vagaries may lead to the wholesale infection of a district and the deaths of several persons, it is time that the laws which aim at preventing the spread of contagion should be thoroughly put into force.—*London Daily News.*

Will-Power in Sickness.—Had Mrs. Dombey only "made an effort," she would not have died. But, poor creature, she was so impotent, so listless, so effortless, that soon as ever her breath began to show signs of leaving her, she resigned to what she regarded as the inevitable; and, as a reporter would picturesquely say, turned her toes to the daisies. When her windpipe became obstructed, she should have jumped up, coughed, jocularly remarked "never say die," and perhaps she would have lived to this day. She chose, however, the more serene and becoming course of conduct, and slid down into the grave. Time and time again people have, when on a bed of sickness, come up to a point when they might easily have died, only that they were determined to live. They have set their feet, as it were, on a trap-door that covered a dark hole, but rather than sink into the hole they have summoned up a deal of courage, made a leap and passed the fatal spot. A little courage and will-power at such a time as this is worth as much as life itself, because it will often be the means of saving life.—*Herald of Health.*

Fruit in Tin Cans.—The English authorities are taking active cognizance of the dangers to which consumers may be exposed by using food contained in cans or boxes soldered in the inside and made with other than refined sheet tin. The French canneries have been prohibited by their government from soldering their cans inside, and also from using any but refined sheet tin. It has also been decided, in order, not only for the purpose of protecting the public health, but so that French trade may not be put on an inferior footing with foreign competitors, that all cans imported into France which do not comply with the new regulation will be detained by the customs authorities.

Variola in Poultry.—Prof. James Law, in the *Bulletin of the National Board of Health*, states that in Europe and Hindostan variola is so common in pigeons and poultry as to constitute a veritable plague.

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Passing Events.

The week has come and gone without bringing with it anything especially noteworthy in the mining world. The work begun a ehort time since on the hydranlic minee has besn suffered to go on without interrnption, strengthening the belief entertained by many from the firet, that no attempt will be made to estop these operations, at least for the present.

Meantime, the committee appointed by the San Francisco Board of Trade to examine into and report upon the debris qneetion, have entered the field, and are now engaged in the active performance of their duty. Such being the case, it would be a seemly thing for the press and all concerned to abstain from indulging in tbose etrong expressions of opinion and intemperate forms of speech which have been eo apt to charaoterize the discussions of this subject on both sides. Never did a topic engage the attention of the California public that more etrongly invoked a spirit of conciliation and forbearance than this. It will be absolutely impossible to ever reach an eqnitable eettlement, or any settlement at all, of this question, without concessions and even very great sacrifices being made by both the partiee to thie controversy. It is not one in which the right is all on one side, nor yet one that ie free from many and inherent difficnlties. It would perplex the wisest judge that ever eat on the bench to decide it in accordance with former precedents, or, viewing the matter as a whole, to make up his mind as to its merits one way or the other.

The Board of Trade appointing this committee is a highly conssrvative, and, as between farmers and miners, is snpposed to be a disinterested body. With them the expression of extravagant opinione and the misetatement of facts can only serve to prejudice the cauee of tbe party making them. The impolicy of indulging such oourse must, therefore, be obvions to all.

Mining Projects that Await the Enterprise of the Fnture.

In soms allusion made by ns last week to the various forms in which the gold-bearing deposits of California occur, it was remarked that throngh this featnre the employment of many diffsrent styles of mining was hsre made possible. In recnrring to this subject it may further be observed that some of these deposits, by reason of the certainty with which thsir valne and the cost of working them can be determined in advance, prssent to that class of capitalists with whom security and permansnce are ruling considerations, attractive openings for investment.

Ovsrlooking for ths present many minor localitiss of this kind, it is our pnrpose now to speak only of a few that havs besn favorably reported npon by leading mining experts or that have otherwiss attracted notice on acconnt of their grsat magnitude or the facility with which their contents can bs utilizsd. We do not now allude to our quartz lsdges, hydraulic mining banks, drift diggings, or snch other gold beariug deposits, as are common both here and elsewhere, but to accumulations of hydraulic tailings, desp undrained flats and basins, river-bed workings, gold beaches and like unique deposits, some of which are rarely if ever mst with ontsids of California.

In our immense beds of hydranlic tailings will bs found work for many ysars, once snitable methods for handling this stuff have besn hit upon. Some of thess bsds are of great sxtent, the largest in the State bsing thoss that have gathered along Bear rivsr and its uppsr tribntaries, and in the bed of Slate oreek, the latter in Sisrra county. Great quantities of thie material have also made lodgment in Shirttail and Indian canyons, Placsr county, in Shady creek, Knapp's creek, about Cherokee, and along Humbug canyon, in Nevada county, in the bed of Willow creek, Yuba county and along many other creeks and canyons throughout the central and northern mining counties; to say nothing of the immensely greater quantities of these tailings that, having been carried farther down, have accumulated in the beds and along the benks of the Yuba, Bear, Feather, American and other rivers, but which will probably be found to contain too small a percentage of gold to admit of their ever being worked with profit.

Of the more valnable of tbese deposits, those resting in the beds of Bear river and ite branches are by far the most extensive, the whole covering a linear stretch of more than 20 miles, and containing a total of at least 100,000,000 cnbic yards. Thie etuff is estimated to contain from 15 to 20 cents to the cnbio yard, giving to the whole a value of say, $20,000,000. Of this amonnt it is believed that 75% can be saved at a comparatively small expenditure on working acconnt.

At first it wae proposed to run off these Bear river deposits by means of a tunnel to be driven through the ridge that separates this stream from the North Fork of the American river, emptying them into the latter; a project that at one time seemed feasible. The floods that annually occnr in this river have, however, carried away so great a proportion of tbe lighter particlee leaving these tailinge to consist at present so largely of coarse gravel, shingle and bowlders that it ie feared thie heavy material could not now be run down into and passed through a tunnel without a larger amount of water than could here be readily commanded, the fall in Bear river being eo inconsiderable. In view of this difficulty the plan of working these tailings with the hydraulic elevator hae been recommended and will probably be adopted, as this machine is now being employed npon eimilar deposits at Willow creek, and elsewhere in the State with entire enccess.

The tailings resting in the bed of Slate creek cover a linear extent of 10 or 12 miles to an average depth of 30 and a width of 100 ft. The idea has been entertained of rnnning ont these tailinge by cutting away the rocky barrier at their lower end, which, having originally estopped them, etill prevents their escape. Ae this would be a costly experiment, and not eure of answering the end proposed, it is more probable that recourse to the hydranlic elevator will here also be had when the time comes for handling this material.

The plan of making open cnts through the rocky obstructions, to the presence of which the existence of these deposits is often due, is now in lese favor with mining engineers than formerly, these cuts having sometimes failed to accomplish the object they were intended to subeerve, and, where effectnal, their constrnction having generally been attended by greater expense than was at the etart anticipated. Thns, the open cnt bronght np to secnre outlet to Indian canyon, cost some $35,000, fully a third more than was originally eetimated. After an outlay of $70,000 in attempting to cut through the granite reef at the lower end of the Willow Creek deposits, the work was abandoned, as reqniring too much time and money to effectnally bottom the basin above, though it is known to be one of the richest in the State. In view of the experiencee had in dealing with this class of deposits, it may be concinded that the above method will be generally snperseded by the hydranlic elevator as a means of working them in future.

In our alluvial flats and basins we have another of these sonrces of reserved wealth waiting on capital and the enterprise of the futurs for development. The most of these loealities being walled in with rim-rock can be drained only with lengthy tunnels, works too expsnsive for individnals or small companies to undertake. As a consequsncs, hut few of them have as yst bsen opsned up, some of the tnnnels started for that purposs remaining uncompleted. Of thsse auriferous basins, one or two of those considered the most promising, are snpposed to exist in Tuolnmne county.

Last fall a company commsncsd lifting and rnnning off, witb a hydranlic elevator, tbe contents of the Yrska basin, an extensive allnvial flat in Siskiyou county. Tbough mesting at first with the troubles incidsnt to the nse of a new and imperfect mschine, the company are now reported to be doing well. An operation of like kind has bsen in progress for more than a year past at Ohio Flat, in Yuba county, whsre several acres of gravel covered with tailings have been run off with such sxcellent results, that it may bs expected others of these deposits will, in like mannsr, bs attacksd befors long, there being scarcely a county along our main gold belt bnt what contains some of thsm.

A projsct has lately besn set on foot and is now being matnred for disposing of the top gravel in Weaver Basin, an immense bowl-like depression in Trinity connty, known to be rich in gold. The consummation of this schems involves the construction of a large tunnsl through a psninsular ridge formed by a long bend in ths Trinity river, whereby fall enongh will be obtained to run off a largs amount of surface gravel in this Basin, though not by any means enough to bottom it, as it is known to be over 600 ft. deep. This latter objsct can only be effectsd by means of anothsr and much longer tunnsl, tbe construction of which it is believed will some day be nndertaken, as a work of this kind would be entirely feasible and very likely accomplish the end proposed. Conjoined with the first of these schemes, will probably be the exteneion to Weaver Basin of the large ditch now being built by Thomas H. Blythe, for conducting the water of Coffee creek and other large branches of the upper Trinity, npon tbe mining grounds of tbe proprietor and others adjacent. Viewed as a whole, this enterprise may be considered one of great magnitude, as well as one likely to lead to a scccessful issne.

Among the varions schemes projected for diverting the water from long sections of the river beds, thereby so draining the same that they can be readily worked, that for turning the Feather river above Oroville is the most extensive, as well, perhaps, as the most promising and practicable, as a tunnel a little more than one mile long would lay bare over 10 miles of tbe river bed, which, there is reason to believe contains a great deal of gold. A compsny has been formed within the past year to take hold of this work, which, it is eaid, will soon be commenced. Along most of the large rivers in the mining regions of California opportunities present for inangurating eimilar enterprises.

What, if anything, is to be done toward more largely utilizing our auriferous beach sands is a matter not so easily to be determined. That something will yet be accomplished in that direction may be assnmed, seeing how generally successful we have been in our contest witb the many seemingly insnperable obstacles that we have been able to overcome in tbe history of gold mining in California. Having effected eo much, the present generation may fairly leave to the legatees of these great bequests tbe solntion of eome of the difficult problems that go with tbe inheritance.

Two Claims on Same Ledge.

By the following ruling of the Land Commissioners it will be eeen that the U. S. Land office will conntenance a locator in taking up two claims on the same ledge: In reply to your letter asking whether yon will be allowed to locate two or more claims upon the eame lode, which yon eay wae discovered by you, I have to call your attention to the fact that section 2320, Revised Statntes, declaree that:

"A mining claim located after the 10th day of May, 1872, whether located by one or more persons, may equal, hnt shall not exceed, 1,500 ft. in length along the vein or lode; but no location of a mining claim shall be made until the discovery of a vein or lode within the limits of the vein located."

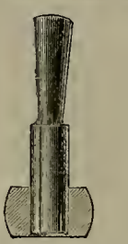
There is no provision of law, however, to prevent partiee from locating other claims npon the eame lode outside of the first location made on the vein or lode. If a vein or lode 3,000 ft. in length ie discovered by a party, two locations may be made by him thereon, each 1,500 ft. in length. A full compliance with the reqnirements of the mining laws will, of course, be necessary in the case of each claim or location before the patent can be issned therefor.

WORK FOR ALL.—Since the hydraulio mines recommenced operations, the hnndreds of men who were thrown ont of employment when operations were euspended, and did not possess the means to get away, have gone to their old places once more. Those who left the county at the time are gradually drifting back again. Employment is fonnd for all worthy applicants, and the demand is mnch greater than the supply at present. The forces at one of the minee will be incrreased some 300 men within the next 30 days. The best part of all is that Chinamen cannot obtain work ot any kind.—*Nevada Transcript, Oct. 14th.*

Application of Standard Measures to Industrial Processes.

[Continued]

It is a remarkable fact that San Francisco is perhaps ths only largs city and manufactnring csnter within this country or Europe where Standard sizes ars not followed. There is a progressiveness in engineering work here that makes it very strange to find ganging implemsnts not conforming to our National Stsndard, and dimensions employed in other parts of the conntry. Most of the works hsre have gauges of a special kind, varying from one another in the varions shops, so as to rendsr interchangs impossibls, and varying also from the trne standard. In soms casss not much, but in all enough to causs confusion. The engraving shows the common form for such gauges.



Iron hsre is rolled to the same dimensions employed elsewhero. Is, indeed, in most casss from ths seme etock used in the Eest. So there appeare no reaeon for not following Standard dimensions, unlese it be the old obeolete idea of compelling cnstomere to rcsort, for repaire or additions to the seme shops whore work was originally made. That, as an economic or business expedient, ie no longer followed elsewhere. We have secured the gas-pipe trade in Canada, as well as some other countries, because the British too long kept to the expedient of making special eizes at the different works. I remember, when a boy, to have visited a mechine shop in this country, where en English manager caused the sorew-threads to be made of fractional pitch; that is, an uneven number of threade to each inch of length, so othere might not repair his work. I have recently seen the same place where that works stood. There are otber kinde of business carried on there now. It causes very little confusion or expense to adopt standard eizss, and there is no donbt, in time, the worke here will do so, especially if the value of machinery is affected by the matter.

After what has been explained in respect to the exactnees necessary in dimensions, it will not be a wonder that Standards are so carefully prepared and carefully kept at Paris, London and Washington. The twenty-thousandth of an inch will not seem a refinement in au original Standard, to be employed in references when work itself is made within one ten-thousandth of an inch.

The fact is, that all the care and precision taken and hereafter to be explained, is no more than ie reqnired; is indeed lese in some cases because an error or variation in one of our National Standarde was detected or suspected abont two yeare ago. The Bronze yard taken from the Imperial Standard at London. Thie bar was taken to Europe by Prof. Hilgard, for the purpoee of comparison, but the result has not so far as I know been made public in this country.

With this much in respect to the economio valne and practical use of Standard measures, I will now pase to their derivation, or rather their adoption, for as a matter of fact none of them are derived. All length Standarde in the world are arbitrary. The ingenuity of man has not thne far succeeded in finding any natural Standard from which constant dimensions could be derived.

There have been numerons attempts, bnt none of tbem enccessful, and the legalized Standarde with which we are familiar, the meter and yard are specific rods of metal to which legal acts apply, irrespective of how their length was determined or the relations of that longth to other dimensions.

Speaking of natural Standards it ie etrange that Nature with her harmony and unerring laws, lacks the qnality of nniformity.

No two things are alike. Among hnndrede or even thousands of persone we may know, there is difference enough to recognize each at a glance. In the billion of human beings on thie earth, perhaps no two are precisely identical. No two animals or plante are alike—not even two leaves, if critically compared. Everything is changing; nothing ie conetant and uniform in nature except the movements of the celestial bodies, or time. Time is always the eame. We have a perfect, natural Standard for that, and ingenuity hae almost snceeeded in deriving lineal measures from time, bnt has not quite snceeeded.

A pendnlum swinging freely always beats in nniform time, ae its length, and irrespective of the distance or range. This has for a long time been known as a scientific fact. Mersenne, an Italian, in 1647, proposed the pendulum test as a base for lineal measure. It has also bsen known that a pendulum 39.13 inches long would beat seconds—60 times in a minute. It was for a long time thought that a poeitive nnit of

length could in this manner be obtained. The meter is in fact almost the length of a second pendulum, being 39.37 inches. It was not, however, derived in this manner.

If three pendulums, one at St. Petersburg, one at San Francisco, and a third at Calcutta, were arranged to beat seconds, and the lengths of these pendulums could be transmitted to metal rods like the Standard yard, then it would be possible to produce a unit of length the same at these widely separated points. Moreover, such a length would, in a sense, be a natural one, derived from natural sources, but these pendulum tests do not always lead to uniform results. One difficulty, almost an insuperable one, can be imagined, by asking the question, where is the bottom end of a pendulum? The point of suspension might be definite enough, but the center of gravity, the center of percussion and other conditions cannot here be determined so as to fix the other points. In such tests parallel rods are employed having two axes inserted, one at the bottom and the other at the top. After the pendulum has been adjusted in one position, it is reversed, the bottom end being placed at the top, and *vice versa* until in either position the oscillations are performed in one second precisely. But even this is not enough. Points on which a pendulum swings or indeed any point made of metal, is not fine enough to compare with the minute lines employed in Standard measures, and much less with the end contact bars such as are prepared at Washington.

The yard is our unit of length. It was wisely taken from the British Standard, thus saving us a good deal of expense and trouble and rendering our Standard doubly secure, because if those in Washington were destroyed it would be easy to secure copies from England. So long as one arbitrary length was to be adopted, it could make but little difference what that length was, and having already the divisions of the yard, feet and inches, in use, it would have been very foolish to have set up a new standard in this country.

In some engineering books an American Standard is spoken of, and the difference between that and the English is given. I have been able to trace this to a suspected source, in some imperfect divisions attempted at Washington, before any of the present apparatus was prepared.

There is in this, and I presume all countries, an unfortunate few who can see no reasons for adopting from other countries what is good and useful. Among that number are those who would prefer to see some new lineal standard set up in this country, differing, if possible, from all others.

The Imperial yard being our standard, some history of its origin will be in place here. We all remember in our old tables: "three barleycorns make an inch." This was an old statute in England. "Three barley corns hulled dry and laid in a straight line," are, nevertheless, a very uncertain length, and this matter is mentioned to show how indefinite were length Standards at the time—about the year 1700. The foot, formerly used in at least seven different European countries, besides Great Britain, was the traditional length of the "king's foot." The foot measure varies from 12.07 inches in Holland to 11.2 in Russia; so the lineal foot is like its human antecedent, of various lengths. The English yard of three ft., or 36 inches, appears in cloth measure, long measure, land and cubic measure. It is the true British unit and is not too long for a Standard. The history of the yard as a Standard, or unit of lineal measure, dates from 1742, when the Royal Society, in England, employed a mechanician, of London, to prepare a brass rod and mark it with the length of a Standard yard. From this rod two copies were made, and one of them adopted by a committee of Parliament, appointed in 1758. No act was passed, however, legalizing this Standard; and another Parliamentary committee was appointed in 1790, to consider and report on a National Standard of lengths. This committee, however, did nothing, and the whole matter rested until 1814. During this time there was much consideration given to the subject by scientific men and learned societies, mostly in the hope of devising means to duplicate or reproduce the yard should the true Standard be lost.

Such consideration as you may infer from what has been explained, was mostly in attempting to find some natural and constant test like the pendulum one.

The committee of 1814, the fourth one counting the royal societies of 1742, recommended the adoption of one of the copies from the old Royal Society yard, and at the same time as a comparative standard recommended that the length of a second's pendulum should be assumed as 39.13 inches long. In 1819 a Crown Commission was appointed to again investigate the matter. This committee after three year's consideration again recommended the adoption of the old yard, and also gave as a constant for weight one cubic inch of distilled water as 252½ grains, and the second's pendulum with a variation of one ten-thousandth from the former report of 1814.

The variation in respect to the pendulum test excited some anxiety, but the old yard was legalized by act of Parliament in 1824.

In respect to this, as has once before been pointed out, the act did not deal with any length or establish a certain unit, as that could be no more than a name; it confirmed a certain metal rod then present, and identified as the Standard of the Nation.

A copy of this rod was procured by our Government and deposited in Washington, where it was known as Bird's Standard, having been made by an optician in London of that name.

Ten years later, in 1834, this famous yard, the result of so much experiment and expense, was burned in the House of Parliament, and as the copies were not considered exact, the whole matter was again to begin anew.

A Treasury Commission was appointed in 1838, who decided against the pendulum test. These commissioners had the matter under advisement until 1841, when it was decided to restore the old yard as nearly as possible from existing copies, and to abandon all attempts to qualify that length by natural Standard of any kind whatever.

Again was appointed a new Government Commission, making, I think, the seventh one; this time, however, composed of men able to deal with so technical a matter.

The aid of mechanicians was called in. M. Sheepshanks, a celebrated mechanic and scientific man, of London, spent 11 years of his life constantly engaged in experiments on material and to derive from the various copies at hand the nearest approach to what the lost Standard had been.

Tens of thousands of readings and comparisons were made. The adjustments were so fine that the variation of one one-hundreth part of a degree of temperature sensibly affected the rods experimented upon.

It will be difficult to understand why all this labor, expense and precision were required, and that so much time should be consumed in experiments. I am not able to explain all this, but know that experiments on material to find that which was uniformly affected by changes of temperature was one thing.

Mr. Airy, now Sir George Airy of the Royal Observatory, at Greenwich, was also engaged in the work which was finally completed in 1855 after 14 years of labor.

Four copies were made of the Standard yard. They are bars of solid bronze 38 inches long and one inch square. One inch from each end is drilled a hole about three-fourths the whole depth of the bars; in these holes are inserted pins or plugs of gold, their top coming level with the central axis of the bars.

Across these pins are engraved fine microscopic lines, one yard apart.

One of these Standards is deposited in the Royal Mint; one was given in keeping to the Royal Society; a third was placed in the Royal Observatory at Greenwich, and the fourth was buried in the lower waiting hall of the present houses of Parliament.

An act legalizing these Standards was passed in 1855, more than 100 years from the time the subject was taken up, and the matter is now at rest no doubt for generations to come, because if any new unit, the meter for example, were adopted in England or this country, its length would be defined by the Imperial yard.

"What a bother about a yard stick" is the thought no doubt of many who first hear of this long search for a Standard, but he must remember all this was done by a very practical common-sense people who thought the end worth the means. One incentive perhaps to this very careful preparation of a Standard was in emulation of the French.

(To be Continued.)

Disastrous typhoons occurred last month in China and Japan.

The Golden Gate Park.

A few years ago the outside lands of San Francisco, westward from Devisadero street, were often the source of fierce contention for possessory right by various parties, not unfrequently resulting in bloodshed and death to the retainers of adverse claimants. How long this state of affairs would have lasted it is hard to say, had not some far-seeing persons succeeded in having a portion of the land in question sequestered and finally, by legislative enactment, devoted to public use in the shape of parks. The property once secured, it was not long in being turned to account. With this end in view, the Governor was authorized and directed, within 30 days after the passage of the act, to appoint three Commissioners, who were to hold office for four years without compensation, each Commissioner to be a freeholder and resident of San Francisco. The first Board of Commissioners was composed of Messrs. S. F. Butterworth, D. W. Connelly and C. F. McDermot, and to them and their successors our city will ever be greatly indebted for what is now the most delightful resort on the coast. We have never heard what

Photographed by I. W. Taber.

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the gentlemen had to say on being shown their field of labor—certainly nothing could have been much more uninviting.

The grant consists of a parallelogram about three miles in length by half a mile in width, and contains in the neighborhood of 1,050 acres, of which fully three-quarters were desolate sand dunes, relieved here and there with a hill of red rock suitable for making roads. In fact, it was a miniature Arabia—there was *Stony* and *Sandy*, but the third part was lacking. Kind nature, with bountous hand, had decked no portion of it with lofty trees and luxuriant herbage, and the lonesome traveler derived but little comfort and society from the presence of vegetable life. Out of such an allotment how nearly has been constructed Arabia Felix, may be ascertained by spending a day within its bounds. Noonday and midnight are not more opposite than

What it Was and What it Is.

It seems to be an institution created for the people, and a more cosmopolitan thing than its visitants can hardly be found. Representatives from every class and condition of society enter its portals, and the gay equipage of the millionaire often presses hard on the tattered garments of Lazarus. During the year just passed the gatekeepers have reported the entrance of the following: Carriages, 42,745; double buggies, 47,070; single, 170,302; total vehicles, 260,117; equestrians, 37,526; pedestrians, 834,863; in vehicles, 780,501; total, 1,652,993.

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[Continued on Page 276.]

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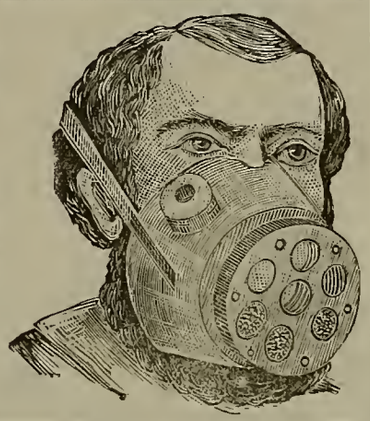

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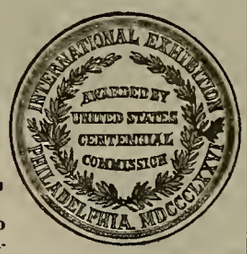

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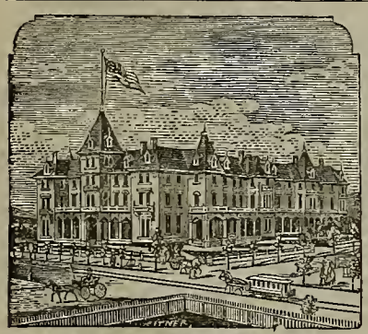

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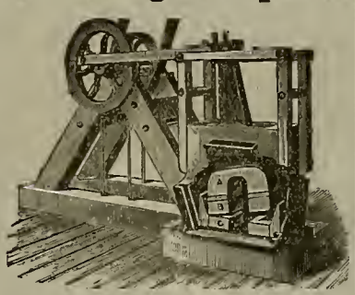

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THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand
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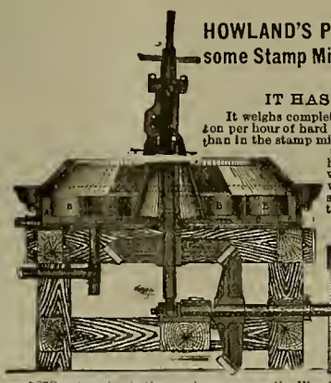
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Arteeian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.
Office and Manufactory, 130 Beale Street, San Francisco.

SHEET IRON PIPE.

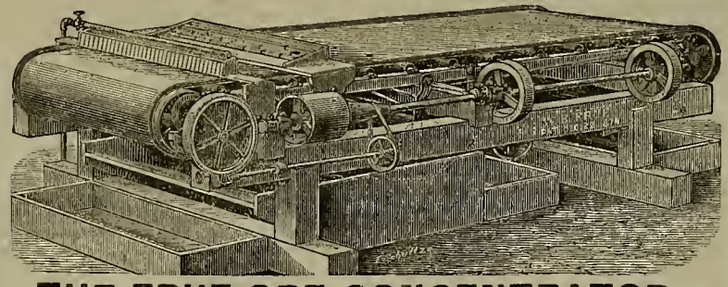
MOREY & SPERRY,
MANUFACTURERS OF
Gold and Silver Grinding and Amalgamating Machinery



HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.
IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds It costs $1,500 ready for the belt Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies Iron Work complete for Wood Frames, also

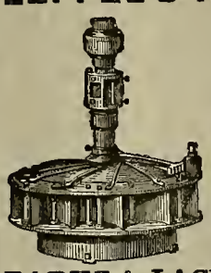
SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.
☞ Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
MOREY & SPERRY—Warerooms, 92 and 94 Liberty St., N. Y.

$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR.
Nearly 300 are now in use, giving entire satisfaction. Awarded First Premium and Silver Medal at the Industrial Fair for 1880 of the Mechanics' Institute of San Francisco, Cal.
Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.
We challenge any other Concentrator in use for a fair and impartial competitive trial, side by side, for stakes of $1,000 each, and we mean business.
☞ A machine with all improvements can be seen in working order and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont street.
ADAMS & CARTER, Agents, Room 7 No. 109 California Street, S. F.

LEFFEL'S IMPROVED WATER WHEEL.



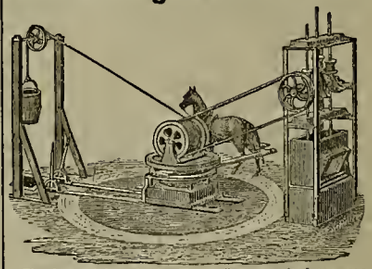
PRICES REDUCED!
PATENTS REISSUED 1868.
The "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE
Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
JAMES LEFFEL & CO., Springfield, Ohio, and 110 Liberty St., N. Y. City.
PARKE & LACY, Sole Agents, 21 and 23 Fremont St., S. F.

GIANT POWDER
MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS.
Nos. ONE, TWO and THREE.
Stronger, Better and Safer than any other High Explosive
Judson Powder
IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.
It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞ Triple Force Caps and all Grades of Fuse.
BANDMANN, NIELSEN & CO.,
SAN FRANCISCO, CAL.

SELBY SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.
Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

Mines and Mining Properties Solicited for Sale.
I have unexampled facilities for rapidly placing Mines and Mining Properties, and claims of
Ascertained Value
Upon the Market, through my Branch Offices in
NEW YORK, BOSTON, PHILADELPHIA, CHICAGO, ST. LOUIS, LONDON, ENGLAND.
OWNERS OF
Meritorious Mines and Prospectors
WHO HAVE NOT THE MEANS TO PROPERLY DEVELOP THE SAME MAY FIND A PURCHASER THROUGH MY OFFICE.
If You Have a GOOD MINE, or a GOOD PROSPECT for sale, apply to me in person or by letter.
JAMES. A. MARS,
45 to 49 Merchants' Exchange, California St
SAN FRANCISCO, CAL.
REFERENCES:
London and San Francisco Bank, S. F., Cal.
Anglo-Californian Bank, S. F., Cal.
John J. Valentine, Superintendent Wells, Fargo & Co.'s Express, S. F., Cal.
J. B. Haggin, Capitalist, S. F., Cal.
Louis A. Garnett, Capitalist, S. F., Cal.
Daniel Meyer, Capitalist, S. F.
Prof. Thos. Price, M. E., S. F., Cal.

New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
Agent and Manufacturer of Mining Machinery
18 and 20 Fremont St., S. F.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING OCTOBER 4, 1881.

247,862.—LOCOMOTIVE—John T. Davis, S. F.
247,749.—ORE CRUSHER AND PULVERIZER—W. L. Dawson, S. F.
247,867.—DUMPING WAGON—Jos. T, Dougine, S. F.
247,769.—PREPARING AND APPLYING CIGAR TIPS—A. J. Lachman, S. F.
247,941.—SCRAPER—Jas. C. McIntosh, Stockton, Cal.
247,781.—CABLE RAILWAY—Henry Root, S. F.
247,868.—FEED CUTTING MACHINE—John Weichart, S. F.
247,788.—WOOD PLANING MACHINE—Asa R Wells, S. F.
248,000.—ROTARY CYLINDER FURNACE—Geo. W. White, S. F.
247,863.—PUMP—M. W. Wilkins, Corvallis, Oregon.
247,976.—BOAT DETACHING APPARATUS—Albert Willis, Colusa, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

AMALGAMATOR.—N. D. Burlingham, Garden Valley, El Dorado county, Cal. Patented, Sept. 27, 1881. No. 247,535. This invention consists in the following construction and arrangement of an ore amalgamator: Suitable means are provided to prevent the mercury rising in the water duct which opens into the mercury bath, and which may be effected by hydrostatic pressure or by other known ways. Open pipes or stirrers are oscillated in the mass of pulp within the tank, and streams of clear water are ejected from the lower ends of said pipes, onto the surface of the mercury so as to keep it free from slimes and dirt, and the pulp is at the same time stirred up. The peculiar shape of the tank gives the precious particles an opportunity to settle. The oscillating arms or pipes are operated by a water wheel which is run by the overflow of waste water from the tank. Copper plates are placed on the tank sluice, which extends from the tank, and also upon the blades or buckets of the wheel, so that all particles of gold and quicksilver are saved. Under the tank is placed a receptacle for any appropriate heating device, whereby the mercury may be kept at a proper temperature in cold weather.

AMALGAMATOR.—A. R. Hamlin, Alameda, Cal. Dated Oct. 11, 1881. No. 248,171. The object of this device is to provide an efficient amalgamator in which the access to the interior is easy, whereby the mercury baths may be moved when required, and the tube cleaned; and it consists of a serpentine tube or pipe formed in sections of gradually decreasing curvature properly joined and having a hopper, into which the pulp and water are fed, whereby pressure is obtained sufficient to force the wet pulp through the tube and through the mercury baths in said tube.

ROAD WAGON.—E. B. Towl, Franktown, Washoe county, Nevada. Dated Oct. 11, 1881. No. 248,235. Under the forward part of the frame of this wagon is a box in which is journaled a shaft, the ends furnished with cranks to which any suitable power may be applied. The shaft carries a double gear which engages with pinions journaled in each side of the box. These pinions have secured to them forked heads which fit into similar forked heads formed upon the ends of tumbling rods, thereby making a joint adapted to be moved to either side and up and down, yet not permitting either piece to be turned independently of the other. This construction is preserved throughout the train of wagons.

FRUIT BOX.—Robt. J. Cooke, Sacramento, Cal. Dated Oct. 11, 1881. No. 248,143. This invention relates to improvements in that class of boxes or baskets which are made of thin, light material or veneer, and which are generally used for packing berries, grapes and small fruits. It consists in the construction of a double floor, the inner portion of which is perforated and is sufficiently distant from the other to allow a free circulation of air between the two.

MINERS WANTED.—As will be seen by reference to an advertisement in this issue of the PRESS, the New Almaden quicksilver mining company are in need of 200 miners. As the company is financially strong and the site of their mine an exceptionally healthful and pleasant one, this want ought to be readily supplied by first-class miners, of whom there are just now a good many unemployed in California. Locality of mine, near San Jose; principal business office of the company in this city.

MORE OIL.—The oil interests in Santa Paula canyon, Ventura county, are said to be reviving. Contracts have been let for boring five wells.

Golden Gate Park.

(CONTINUED FROM PAGE 273.)

area of 2,055,630 ft., and of walks for pedestrians, 10,000 ft. This does not include road making done by the Bush fund.

These walks and roads have been on every hand embellished by the gardener's art, until, in her gay attire, the park enfolds a vast variety which is pleasing to the human mind, and consequently has a tendency to tranquilize the agitated passions, exhilerate the man, and render all around him delightful. Here he who has been confined with the business of the week, toiling in the "sweat of his brows," becomes invigorated and refreshed as he takes his walk, with the happy family group about him, and marks how the desert has been made to blossom as the rose.

The Conservatories.

This structure is favorably situated on a commanding site between the main drive and the north ridge road. The building is about 250 ft. in length, covering an area of about 15,000 sq. ft., and exceeded in size only by the Government conservatory, at Washington. Oriental in style, graceful in outline and highly ornamental. The main entrance, or reception-room, is 23 ft. square, substantially furnished, and ornamented with a fountain in the center. From this room the visitor enters the rotunda—a circular room 50 ft. in diameter and about the same number of feet in hight. An octagonal space in the center of the rotunda is occupied by several varieties of rare tropical plants; and the dryness of the atmosphere is relieved by the spray from a fountain set in the center of all.

On the right of the rotunda is the Orchid house, an arched room, 35x50 ft. There are many rare and beautiful varieties of this strange family to be found here, representing a monetary value of hundreds of dollars, principally the gift of our public spirited citizens. The space not all being taken up by the orchids, an infinite variety of other beautiful flowers have been introduced, presenting the great difficulty of deciding which is possessed of the greatest charm; yet certainly, nothing can be much more beautiful than the collection gloxinias here assembled. The beauty of the flower steals upon one, and almost before we are aware of it, we are absorbed in admiration.

The arched room on the extreme right of the building is set apart for the cultivation of the larger and rarer aquatic plants. A circular pond, 28 ft. in diameter, has been constructed here, with the necessary heating apparatus, and the general public already know the result. In this tank the Victoria Regia lily reigned supreme, surrounded by the less pretentious, yet still beautiful sisters of her tribe.

The Ferns.

Although not confined to any one portion of the conservatory, more may be found adjoining the lily pond than anywhere else. The collection comprises all the finer varieties, such as tree ferns, staghorns, climbing ferns, adiantums, and in the more sheltered nooks the magnificent Farleyense shows how beautiful a thing may be yet bear no flowers. There is probably no form of growth that attracts more attention than ferns. Their delicate foliage causes them to be sought for cultivation, or their fronds are carefully gathered and dried by the ladies against the time when occasion offers for spatter-work. They furnish to botanists a broad and inviting field for investigation, but their greatest beauty can be brought forth only with the microscope. Thus they appeal to the scientific element of man's nature as well as to the æsthetic, and while they gratify the taste, furnish food for the intellect.

We doubt the existence of a superior floral display anywhere in the world, and a 30-year old city being the possessor of it must commend, abroad, our admiration of the beautiful, as well as the public spiritedness of our citizens.

On the left of the main building is a wing similar in size and shape to the Orchid house, in which may be found some of the choicer varieties of roses, such as Mareschal Neil, Cloth of Gold, etc., together with azaleas, lilies and a multitude of beautiful foliage plants. The Californian, having grown tired of exotics here, recognizes an old friend in our beautiful Mariposa tulip, cultivated and brought to perfection, and it is at once placed in the front rank of flowers.

The greenhouse adjoining, which corresponds in general features with the aquatic department, is intended for the growth of hard-wooded plants, such as japonicas, azaleas, etc. Here, apparently with a desire to show what may be done, the gardener has taken several heliotropes and trained them to standards, until they have attained a hight of from 8 to 10 ft., without a sign of vegetation on the stem, until the top is suddenly terminated in a magnificent umbel of flowers, as delightfully fragrant as only heliotrope can be. There is also an old-fashioned rose geranium trained in the same manner, to a hight of 18 ft. The lover of camellias will here have no cause for complaint. This room probably presents the greatest diversity of color to be found in the building, for here are stored the calceolarias. This collection (calceolaria) does not command attention so much for its beauty as for its abundance of flowers and variety of hues; among scores of plants, no two being found of the same shade. The border plant, the Alternanthea amabalis (?), being easy of cultivation, pleases everybody, and is one of the finest edging plants that can be grown.

In the rear of the building are two propagating pits, 50 ft. long by 12 ft. wide; a growing house, 75 ft. long by 25 ft. wide; and a potting-room, 30 by 30 ft.

A heating apparatus supplies the requisite warmth to all the chambers, and an admirable system of ventilation enables the keeper in charge to preserve at all times an equable temperature.

Thirty-five tons of glass and over three tons of putty were used in the construction of the conservatory.

The Commissioners have lately received from Sir Joseph Hooker some 65 varieties of Sikkim and Bootan rhododendrons, the finest and choicest of the family, many of which will have to be grown in the conservatory to be protected from the prevailing winds.

The Attributes of Mining.

An article recently appeared in the Salt Lake *Tribune* which is truthful in many ways as regards the industry and consequent effects of the search after the precious metals. It truthfully asserts that the man who tries to make a livelihood and a fortune by mining for gold and silver has a pretty hard time. It is true that he has to purchase everything with which to prosecute his work, and equally true that if he succeeds, all he gets is so much added wealth to the country, and that it comes in a form which not only does not endanger the sale of any other man's product, but rather helps every other man in the community. Still, if the fairest prospects fail and he loses his all he gets very little sympathy, while if he succeeds the finger of envy is sure to point to him, and the declaration is made that, "he, without any particular sense, stumbled on a fortune," or that "he got rich in a stock swindle." And yet mining is the only thoroughly legitimate business that can be engaged in between the Rocky and Sierra Nevada mountains. That is, it is the only leading interest. All others, at least the prosperity of all others, depend upon mining. Take it away, and Idaho, Montana and Nevada would become mere stock ranges, and the coyotes would bark, undisturbed, at the locomotives of the overland trains. In its influence mining extends beyond all industries. When from the West wheat is shipped to the East, and a million of dollars is paid for it, it is only a species of barter after all. The world at large is no better, except that it has a little more food supply, which amounts to nothing, because a few strong arms or valueless hands can raise it in a single season. But when a million of gold is taken from the earth, there is a creation. The world is that much richer in something which it did not have before, which is indestructible, and which is so rare and so much prized that all races, civilized and savage, receive it at its established value. Again, let there be a double wheat crop raised in any single year, and the value of wheat lands would fall, because wheat raising would be looked upon as an unprofitable business. But let there be a double yield of gold and silver in the far West in any given year, and all over the far East the price of real estate would advance, because gold is chiefly valuable because of its rarity, and the more there is the more it takes of it to make a measure of values for other property. The gold of California, while it enriches but a few Californians, doubled the value of lands in the Eastern States, over whole States, while to the arteries of commerce, before so sluggish, it operated like a transfusion of new and healthy blood. And when the war of the rebellion was sore, the gold and silver of California and Nevada were the pivot on which, perhaps, the mighty war turned. The men of the East should remember these things, and should reflect that mining is not barter like the ordinary business of life, but the creation of wealth. Its success is more than the making rich of the miner; it quickens the pulse beats of trade to the remotest extremity of the Republic.

News in Brief.

JOHN W. CARROL, the actor, is dead.

SMALL POX and typhoid fever are raging in Chicago.

GAS works are to be erected at once in Tucson, A. T.

SENATOR MAHONE has decided that Gen. Early is beneath his notice.

FLOUR is selling at $15 per 1,000 lbs. at the Eagle mills near Ashland, Oregon.

THE recent hurricane in England and Ireland did immense damage to property.

A NEWSPAPER is to be started at Mandan, Montana, on the Northern Pacific.

THE steamer *Great Eastern* is to be sold again. She is the white elephant of the sea.

SOME 200 Postmasters will, it is alleged, be implicated in the Star route frauds.

LOCAL Independent movements exist in a majority of the counties of Mississippi.

A WASHINGTON correspondent says President Arthur is more taciturn than Grant was.

NINETEEN miles of track are already laid on the California Southern from San Diego.

THE Mississippi river is again on the rampage, and fears of great damage are entertained.

A steamship capsized in the drydock at New York, badly damaging her and killing one man.

ARRESTS of prominent Land Leaguers continue in Ireland, and the excitement is intense.

THE railroad up the Nile is progressing, and already the cry is heard "all aboard for Sahara."

A NEW channel is to be made for the Yuba river, intersecting the Feather at the old '49 town-site of Eliza.

THERE are 55 quartz mills in Arizona aggregating 585 stamps, only one of these mills being run by water-power.

MEXICAN troops are marching to the Arizona border, to co-operate with the American forces against the Apaches.

CAPT. H. H. RINGLEBERGER and Hon. G. D. Wise fought a duel near Richmond, Va., in which neither was hurt.

THE Standard Oil Co. has been sued by the State authorities of Pennsylvania to recover $3,000,000 in taxes and penalties.

PERRY STUCK, an old time stage driver, lately committed suicide in the stage stable at Jackson's ranch, Little Porcupine, Montana.

SECRETARY BLAINE has again notified the President that he would gladly be relieved of his official responsibilities at once.

EDWIN BOOTH and his wife have separated, the estrangement being caused by certain business transactions within the family.

THE Indian charged with killing the Perkins family has been found guilty at Yakima City, W. T., of murder in the first degree.

A MILL is about to be erected at Cornicopia, Nevada, for working the tailings of the Leopard mine of which there are about 200,000 lbs.

CAPT. SYLVANUS SWAIN, aged 82, and a pioneer, died at Martinez a few days since. Capt. Swain sailed up the Pacific coast 53 years ago.

THE Government work on Coos bay extends from the shore of Rocky Point into the bay upward of 1,300 ft. At the outer end the water is 26 ft. deep.

SAM DODGE and Jim Aelic, two Indians convicted of the murder of Ezra DeGarmo, in Amador county, have been sentenced to be hanged December 8th.

THIRTY murderers are in jail in Philadelphia, awaiting trial, and it is thought that not less than half of them will be convicted of murder in the first degree.

TWENTY-SIX Mormon missionaries will leave Salt Lake City on the 18th inst., for Europe, to make converts, chiefly in England and the Scandinavian countries.

THE jail of Eureka county, Nevada, is empty, a thing that has not occurred before for a long time.

THE gale which caused such damage in England and Ireland extended to France and Germany.

EX-GOV. IRWIN has repurchased his old paper, the Yreka *Tribune*, and resumed the editorial harness.

THE settlers upon the Upper Columbia river, in Washington Territory, are constantly agitating the matter of completing the locks around the Cascade, in order that they may have open highway to the ocean.

Mining and Scientific Press.

THE MINING AND SCIENTIFIC PRESS is the leading mining journal in America, and enjoys a larger circulation among the more intelligent operators and workers in the gold fields of the world.

Established in 1860, it has firmly maintained its position as a reliable, progressive journal. The information given in its columns has saved millions of dollars to the practical miners, metallurgists, mill men, mine and shareholders on the Western side of our continent.

Among its contributors are the ablest and most experienced mining engineers, superintendents and practical miners in this country.

The PRESS gives a condensed summary of Mining News from the most important mining districts of the country.

New processes and methods of mining are described in its weekly issues. New mining machinery and improvements are frequently illustrated and explained in a manner to be of great value to all interested in mining.

As a scientific and mechanical representative of the Pacific coast it is decidedly popular, and a standard journal with the most thrifty industrial people of the Pacific States and Territories. Its authority is of the highest order, and its usefulness in its special sphere unrivalled.

Every public library, mining engineer, metallurgist, mining operator and intelligent mechanic and manufacturer, will find profit by its reading.

Subscription, $4 a year in advance. Sample copies, postpaid, 10 cents.

DEWEY & CO., Publishers.

No. 252 Market St., San Francisco, Cal.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARMD C. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—San Mateo and Santa Clara counties.
C. E. WETMORE—Alameda county.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francisco.

ANNUAL STATISTICIAN of 1881.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 316 California st. Price, $4.

Business and Patent Offices Removal.

After October 29th, our friends and patrons will find the business offices of Dewey & Co. removed from No. 202 Sansome St., to No. 252 Market St., on the northeast corner of Front and Market Sts. We have secured the entire upper floor of Nos. 250 to 252 Market St., and No. 12 Front St., where we shall have permanently more spacious and pleasant rooms for the accommodation of our increasing business. Our apartments will have two main entrances as shown in the following engraving, viz:

OUR STAIRWAY, No. 252 MARKET ST.
OUR ELEVATOR, No. 12 FRONT ST.

The building we have now occupied between four and five years is to give place to a new one, which fact causes our removal.

Old and new friends are cordially invited to give us an early call in our new quarters.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F.D., at this office.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We will send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

San Francisco Metal Market.

[WHOLESALE.

WEDNESDAY, October 19, 1881.

IRON.—		
American, Pig, soft, ton	— —	@30 00
Scotch, Pig, ton	28 00	@30 00
American White Pig, ton	— —	@— —
Oregon Pig, ton	— —	@— —
Clipper Gap, White	— —	@30 00
Clipper Gap Car Wheel	— —	@33 00
Refined Bar	4 @	7½
Horse Shoes, keg	— @	5 50
Nail Rod	— @	7½
Norway, according to thickness	6½@	7½
STEEL.—		
English Cast, lb	14 @	18
Black Diamond, ordinary sizes	— @	14
Drill	15 @	18
Flat Bar	14 @	15
Plow Steel	— @	6½
COPPER,—		
Ingot	— @	52
Sheet	32 @	35
Sheating, Tinned 14x18	36 @	41
Nails	— @	—
Bolts	38 @	42
Old	— @	18
Bar	— @	22
Cement, 100 fine	— @	15½
LEAD.—		
Pig	5 @	5½
Bar	— @	6
Pipe	— @	8
Sheet	— @	9
Shot, discount 10% on 500 Bags		
Drop, per bag	— @	2 10
Buck, "	— @	2 30
Chilled "	— @	2 50
TIN PLATES.—		
10x14 I C Charcoal	— @	7 70
10x14 I C Coke	6 15 @	6 40
Banca Tin	— @	25 00
Australian	— @	30 00
I. C. Charcoal Roofing 14x20	— @	6 90
ZINC.—		
By the Cask	— @	9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @	10
NAILS.—		
Assorted Sizes	4 00 @	4 25

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

REGULAR DIVIDEND NOTICE.

OFFICE OF

Northern Belle Mill and Mining Company,

SAN FRANCISCO, CAL., OCTOBER 10, 1881.

At a meeting of the Board of Directors of the aoovenamed Company, held this day, a dividend (No. 54), of fifty cents (50 cents) per share, was declared, payable on Saturday, October 15, 1881. Transfer books closed on Tuesday, October 11, 1881, at 3 o'clock P. M.

WM. WILLIS, Sec'y.

Office—Room No. 29 Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF

Northern Belle Mill and Mining Company

SAN FRANCISCO, CAL., OCTOBER 10, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, an extra dividend (No. 55), of twenty-five cents (25 cents) per share, was declared, payable on Saturday, October 15, 1881. Transfer books closed on Tuesday, October 11, 1881, at 3 o'clock, P. M.

WM. WILLIS, Sec'y.

Office—Room No. 29 Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

Belcher Silver Mining Company. Location of principal place of business, San Francisco, California. Location of works, Gold Hill, Storey county, Nevada. Notice is hereby given, that at a meeting of the Board of Directors, held on the twenty-ninth (29) day of September, 1881, an assessment (No. 28) of one dollar ($1) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 8, No. 327 Pine street, (Stock Exchange Board Building), San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the first (1) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the twenty-fourth day of November, 1881, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors

JNO. CROOKETT, Sec'y.

Office—Room 8, No. 327 Pine St., (S. F. Stock and Exchange Board), San Francisco, California.

Franklin Gravel Mining Company.— Location of principal place of business, San Francisco, California. Location of works, Dutch Flat, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the Fourteenth (14) day of October, 1881, an assessment, (No. 7) of Thirty (30) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 310 Pine street, Room No. 44, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 14th day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Fifth (5) day of December, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

GEO. R. SPINNEY, Sec'y.

Office—No. 310 Pine St., Room No. 44, San Francisco, California.

Newcastle Gold Mining Company.— Location of principal place of business, San Francisco, California. Location of works, Yankee Hill Mining Dist, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Twenty-third (23) day of September, 1881, an assessment, (No. 2) of two (2) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 33, No. 318 Pine St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the First (1) day of November, 1881, will be delinquent, and advertised for sale at pubbe auction, and unless payment is made before, will be sold on the Twenty-first (21) day of November, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

E. G. MATHEWS, Sec'y.

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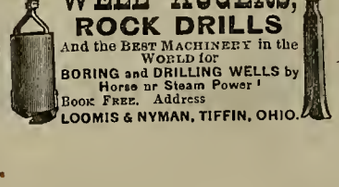

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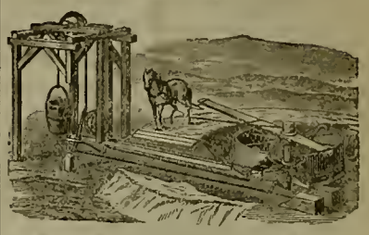

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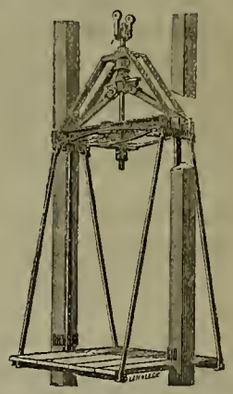

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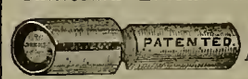

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Surveys for Location or Patent. Maps and Plans Drawn. Mining Properties of all kinds examined and careful reports made of the same. Consultations on Mining Investments. Address, THOS. W. REECE, CIVIL ENGINEER, Oroville, Butte Co., Cal. References given and required.

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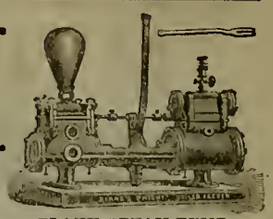

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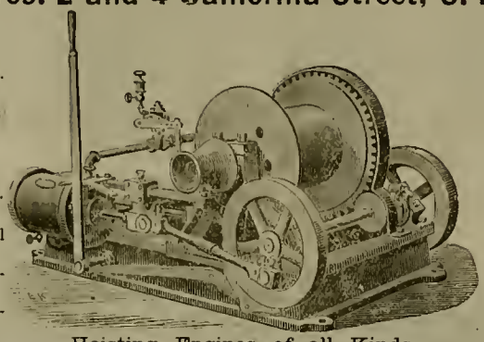

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Patented in 1878.

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This Furnace is Constructed with two SEPARATE HEARTHS, one for DESULPHURIZING and one for CHLORIDIZING the Ore.

BOTH PROCESSES ARE PERFORMED AT ONE OPERATION.

An endless chain carrying conveyors or scrapers passes continuously through over both hearths, going one way through one chamber and the other through the other chamber. By this means the ore is fed and discharged at the same end of the furnace.

A cheap Furnace to build and to run.

The process is essentially the same as the well-known Freiberg process; but the mechanical devices applied to the furnace and the peculiarity of its construction enable the inventor to thoroughly desulphurize and chloridize the ore to a higher percentage than other furnaces, and with less cost for fuel and labor.

At Washoe and Ophir Tailings Mill it costs $1.10 per ton to work 40 tons in 24 hours.

At the Exchequer Mill, Alpine County, 20 tons are worked in 24 hours, at a cost of $2.61½.

Lewis Chalmers, of the Isabella G. & S. M. Co., Silver Mountain, Alpine Co., says: The O'Harra Furnace did all that is represented in the MINING AND SCIENTIFIC PRESS, roasting and chloridizing at the figures there given, antimonial and arsenial sulphurets of silver up to from 84% to 95% of the assay.

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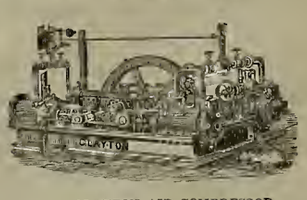
—AND—

INGERSOLL ROCK DRILLS.

INGERSOLL ROCK DRILL.



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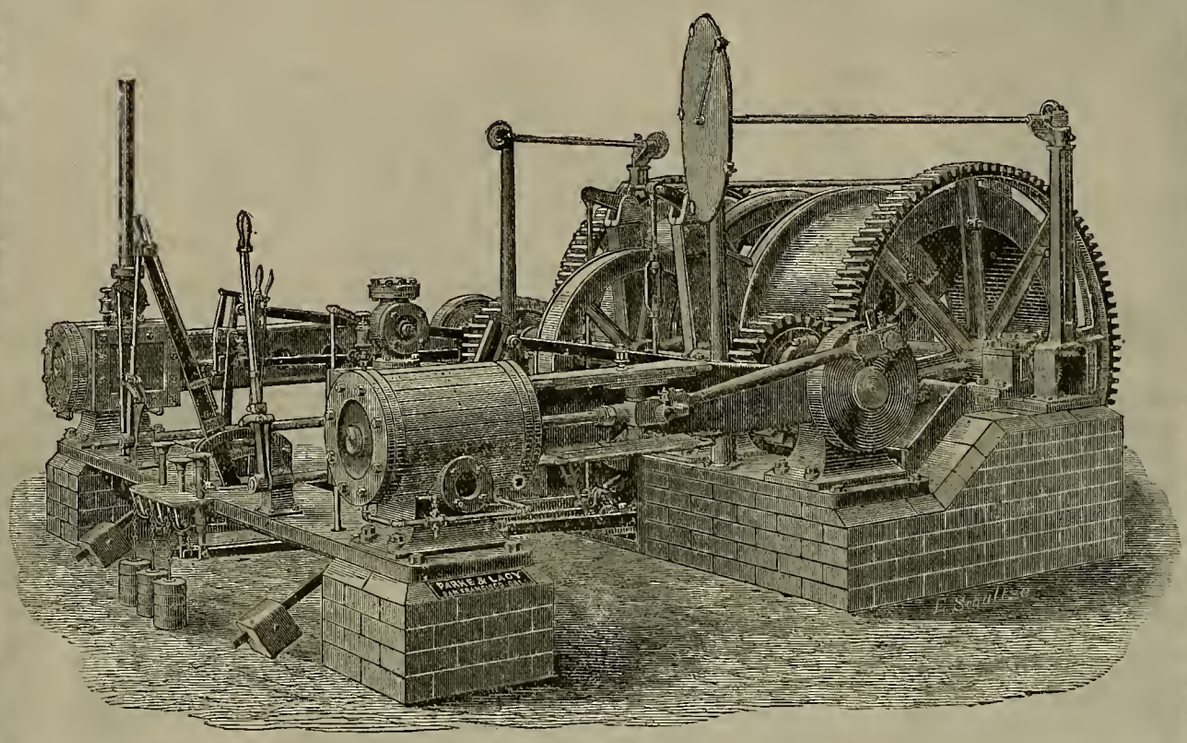

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WOOD WORKING MACHINERY, MANUFACTURED BY THE H. B. SMITH MACHINE COMPANY,

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EMERY WHEELS and GRINDING MACHINES.

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Limit of weight for 25-inch Lathes, 300 pounds. For 17-inch Lathes, 150 pounds.

READY WITHIN 10 DAYS,

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Good Land and Sure Crops.

There has been steady and tolerably rapid advancement made in the growth of a majority of the towns in Colusa, Butte, Tehama and Shasta counties. Especially is this so in the agricultural districts where the land produces at least fair crops in all seasons—wet or dry—as does the land on the Reading Ranch. Those looking for homes in California where diversified farming will pay every year; where wood and water are plenty and easy to be obtained, and other desirable advantages are to be had, should address the proprietor of the Reading Grant.

Some 14,000 out of 26,000 acres of the grant remain for sale at comparatively low rates, in quantities to suit purchasers, on easy terms. Prices range from $5 to $30 per acre. The tract is between two and three miles wide, with the Northern Division of the C. P. R. R. passing centrally through its entire length. Send postage stamp for free circulars containing information about Shasta County and these lands, to the proprietor of Reading Ranch.

EDWARD FRISBIE,

Anderson, Shasta County, Cal.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, OCTOBER 29, 1881.

VOLUME XLIII Number 18

Application of Standard Measures to Industrial Processes.

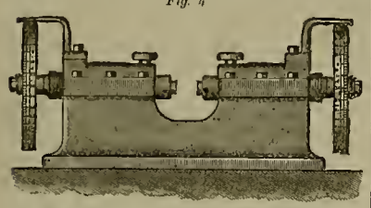
[Continued.]

In 1792, they made carsful measnrsments of a dogree of msridian hetween Dunkirk and Barcelona, and by snhdivisions cstahlishsd the famons mstsr, then thought to hs ono ten-millionth part of a quadrant of meridian, or ons forty-millionth of the circnmferenco nf tho earth at the msridian. Thie, yon will perceive, was an attsmpt to derivs a standard from natnrs or from natural sonrces. It was, howsvsr, found in future computations that this was not reliahle, and if tho meter were lostit could not he restored with precoision, or in a manner to claim popular acceptance; so that in 1795 the French Republic passed a decres estahlishing ths length hetween the ends of a certain har of platinum to he a mstsr and the National Standard. This meter, as hefore explainsd, is 3 ft 3⅜ inches long—not precisely, hut the difference is not mors thsn fonr tsn-thousandths.

Sir John Herschel propesed that the earth's polar axis hs adopted as a hasis from which a unit should be drawn, hut ths failure in former schemes of ths kind prsvented any action respecting his plan.

After thess explanations you will he ready to agree that our Governmcnt, as hefore remarked, has been wiss in not attsmpting to search for natural Standards or to vary from those now estahlished. The time and monsy that might havs thns heen wasted have been wisely put to a hsttsr nss in prsparing apparatus for comparing, transmitting, dividiog, and so on—

Fig. 4.



apparatus that has no equal in ths world; in effi ciency and completsness, at least.

This ends what I will say ahont Standards and their derivation, and hrings us to what may he called apparatus of transmission or comparison In othsr words, to implements hy which ths Standards nf length are applied to industrial purposes. The limits of my lecture will admit of noticing only a few of ths varied means employed, and these for the most part original or testing implcmsnts.

As hefore rsmarked, there are two means of comparing measursmcnts—ens hy sight and ons hy touch. In msasuring machines, the lattsr is generally spoken of as end contact.

Sight is hoth more and lsss exact than tonch. We cannot well see divisions of less than onsfiftisth of an inch with ths naksd eye—that is, cannot see thsm so as to he counted and nsed. One-hundredth of an inch can he seen on a stesl rule, hut not counted. This then is the limit of sight in so far as looking at lines without glasses, hut touch detects variations to one tweuty-thousandth of an inch. There is perhaps no one present who could not detect a difference of that amount hetween two calipers like this in an experiment. The sensitiveness of touch is wonderful. I am not prepared to say what its limits are even with ordinary tools, not gauges, hut common calipere and the like. As a matter of conjecture, I will eay one fifty-thonsandth of an inch.

The application of sight to determine lengths or comparisons, "readings" they are called technically, can he divided into three methods, namely: (1.) Observing marks or lines, as on a common rule, with the naked eye. (2.) Obssrving fine lines hy means of magnifying glasses. (3.) Observing by magnifying movement, or magnifying quantitiss, hy meane of mechanism.

Touch is the most simple, and is generally employed. The machine shown at Fig. 4, operates partly hy hoth msthods, hut ths other implements are all on tho touch principls.

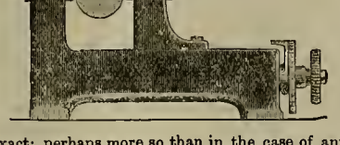
I will first speak of end contact, for Standard rods, and so on. This was prnposed hy Sir Joseph Whitworth, ahont the year 1850. He contended, and proved, teo, that the greatest prscision in dsfining a length, was hetwsen ths two ends of a bar, its length to he dstermined and measnred by contact or touch. I do not think thers was anything new in the method proposed, hecause the mster estahlished hy decres 1795 was a har with end contact.

Sir Joseph's invention consisted in new and more accurats mechanisms for testing or comparing lengths. He had made in his works in Manchestsr in 1851, a small machine, not unlike the ons shown ahove, only with more dstail, that wonld msasure or indicate the one one-millionth part of an inch.

Extraordinary as this may scem, it is strictly trus. Numerous public exhihitions of the machine havo hesn made sincs that time. I havs myself oftsn sesn and examined it, and am personally acquainted with the engineer, now a manags of a large works in England, who made most particular parts of the mschine. Familiar as I have hecn for ysars with dsvicss for contsct measurement, this sesms a difficult, but not impossihls attainment.

The fitting of the machine was, of course,

Fig. 6.



exact; perhaps more so than in the case of any mschanism sver before made; that was all. The tssts wers not mads hy placing pieces hetwesn points hy hand, as in the case of the machine here. A emall, thin plate of steel, called a "feeling piece," is employed. With the same appliances, and with the required scalcs for reading such minute quantitics, I think the present machine might indicate to the one one-hundred-thousandth part of an inch.

In some experiments tried with the Whitworth machine, a sensihle change could he detected in a har of mctal if the finger nail was allowed to touch it, so sensitive are metal rods to changes of temperature.

Comparisons are made hy touch, hut msasurements must he read hy sight. It is easy to distinguish minute differences hy touch, hut to tell how much these differences are, or their valne, ae it ie called, measuring scales are required.

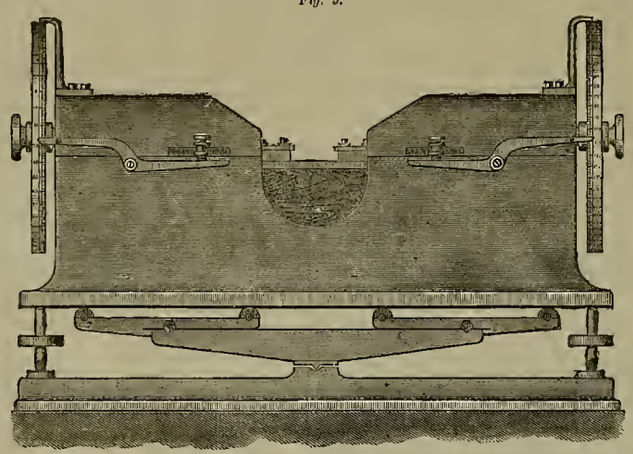
In the Standard machine at Philadelphia, shown in side elevation at Fig. 5, one of the wheels, 15 inches diameter, was marked with 1,000 divisions. In eome of the higher-class machines for shop use, we divide to 500 divisions,

Figs. 6 and 7 show calipsring machines of the form commonly employed in enginssring estahlishmsnts.

I think ths apparatns employsd at Washington for comparing two things, the Standard yard or metcr, for sxample, is perhaps the most perfsct ever devissd, and is extrsmsly simpls. A small, flat mirror is mounted on an axis, so as to swing for a short distance. Rods to hs compared are so plscsd as to coms in contact with this mirror, and if they hs longer or shorter, ths mirror is turned on its sxis accordingly. From ths fsce of this mirror, a ray of reflsctsd light nesrly 30 ft. long falls on a graduatsd arc, so ths least change is magnifisd hundreds or thousands of times, so as to hs sasily sesn and read.

Anyone can try and sxperiment in multiplying movement in this way, by holding a flat mirror in the snnlight and throwing the reflection on a distant wall. The slightest movement

Fig. 5.



of the mirror will causs a grsat movemsnt of ths rays of reflected light. The light is, in effect, a long postsrior index.

A common clock may ssrve as an sxampls of another means to magnify motion in minnts measursmsnts. Suppose that in a sevsn-day clock the wsight descends fonr fest in a wesk of 168 hours, and that the minute hand is six inches long. The point of the minuts hand will movs in a week 252 ft., whils the wsight moves four ft., ths proportion hsing as 63 to 1; that is, ons inch of movsmsnt of the wsight would produce five ft. one inch of movement at the point of the minuts hand.

Supposs the same clock to have a second hand two inches leng, that would move in a week 5,040 ft., or 1260 timss as far as the weight. When the weight descended one inch, the secoud hand would move 105 ft. Now, such a clock would he a very correct measuring machine, and one of surprising sensitiveness, if there were some way provided for determining the distancs moved hy the weight. If, for example, the second hand wers moved 1¼ inches, the weight would descsnd one ons-thousandth of an inch.

At first thought, it seems that a measuring machine could thus he made, and he at the same time cheap and simple; hut it would not do at all for measuring. Minute differences could he shown or felt, hut measuring is quite another matter. The clock weight, in the example assumed, might descend one-thonsandth of an inch during the first 1¼ inches the second hand was moved, hut it might not descend the same for the next 1¼ inches, it would not do so indeed hecause trains of cog wheels such as are employed in reducing clock motions, or indeed any cog gearing would not do to measure with. Screwe are generally regarded as an accurate meane of producing uniform motion, and are employed in all measuring machines I have seen, hut suoh ecrews are far from true.

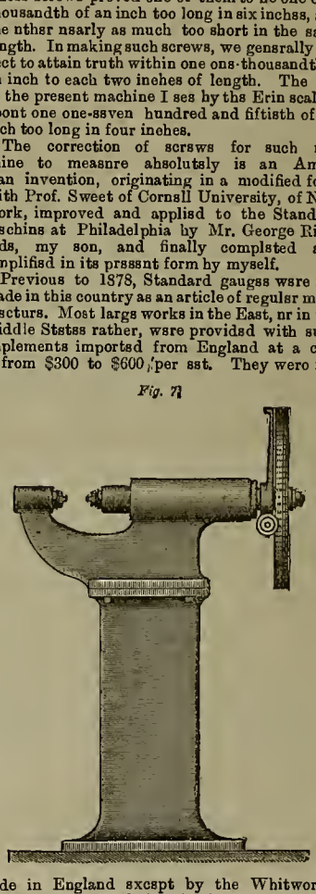
The longest measuring range attempted by Sir Jossph Whitworth is, I helieve, two inches.

I have paid to Sir Joseph Whitworth & Co. more than $25 each for screws one inch in diameter and sevsn inches long, made with all possihle care and guarantsed to he Standard. Thess screws proved one of them to he one onsthousandth of an inch too long in six inchss, and the nthsr nsarly as much too short in the same length. In making such screws, we gensrally expect to attain truth within one ons-thousandth of an inch to each two inches of length. The one in the present machine I ses hy ths Erin scale is abont one one-ssven hundred and fiftisth of an inch too long in four inches.

The correction of scrsws for such maohine to measnre ahsolutsly is an American invention, originating in a modified form with Prof. Sweet of Cornsll University, of New York, improved and applisd to the Standard mschins at Philadelphia hy Mr. George Richards, my son, and finally complsted and simplifisd in its prsssnt form hy myself.

Previous to 1878, Standard gaugss wsre not made in this country as an article of regulsr manufscturs. Most largs works in the East, nr in the Middle Ststss rather, wsre providsd with such implements importsd from England at a cost of from $300 to $600 per sst. They were not

Fig. 7.



made in England sxcspt by the Whitworth Co., so you may well imagine it was a business of some importancs to that company. In 1878 and 1879, tho manufacture was hegun in Philadelphia, or rathsr the first accurate implsmsnts were made, hecause the business was commenced in 1862, or soonsr.

In a paper read hefore the Franklin Institute in 1879, I gave a detailsd account of the origin and prngress of this difficult mannfacture. This paper, with drawings of some of ths machinss employed, has rccently heen puhlished here in San Francisco, and is furnished free to applicants hy ths San Francisco Tool Co.

[Concluded.]

Mining Profits.—As an illnstration of the profits to he derived from mining sntsrprises and invsstmcnts, take the Con. Virginia, of Nsvada (eilver), which has paid $42,930,000 in dividends. The Calumet and Hecla (copper), has paid $19,850,000 in dividends; the Cantral (copper), $1,560,000; the Homestake (gold), 1,110,000; the Idaho, $3,024,000; the Northern Belle; $1,987,500; the Plumas, $1,194,840; the Quincy, $2,710,000; Sierra Buttes, $1,160,000; Standard, $3,000,000; and the Western, $1,200,000, not to mention the hundreds of other companies that have divided enormous sums amongst stockholders, and, more than large and regular dividends; in many instances the etock has doubled, trohled and qnadrnpled in valne.

Reports from the recently discovered mines near Palisade are discouraging. It was said that the ore was as rich ae that found in Safford district, and the prospecte fully as good as those of Safford, hut the leader saye several samples essayed in Eureka failed to pan out worth a cent, although the rock had every indication of carrying metal.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Butte City and Mines.—Montana.

Winter Coming On.

EDITORS PRESS:—Since my last writing, matters and things in this city and vicinity have remained much the same as at that date. Admonished by the near approach of winter the great activity in getting out lumber, providing fuel and erecting buildings has increased, though the immigration has, for the same reason, been about stopped. Meantime a good many have left, and more will leave before the extreme cold weather sets in, thus further relieving the stringency of the situation. These deep snows and long winters constitute the one draw-back to Montana. But the disadvantages growing out of them will be measurably obviated when the principal mining centers come to be connected with the outside world by means of railroads, as they soon will be.

The Early Extension of the Utah and Northern Road

To this point may now be considered certain, the efforts being made on the part of our citizens in furtherance of that end, promising to be crowned with success. The company building that road has shown a commendable spirit of enterprise from the first, having commenced the work and pushed it north from Ogden, its starting point, at a time when the resources of this northern country, though pretty well known to be large, had as yet been but little developed. Then the Wood River mines had not been discovered, while the wealth of the still more important mines about Butte remained in good part to be established—districts that will become the two great business feeders of the road.

The track of the Utah & Northern, a narrow-gange road, has already been laid down for a distance of over 250 miles, and will no doubt be hereafter rapidly extended this way. Some of our merchants do not very warmly espouse the cause of the railroad, fearing it will reduce the price of goods and promote competition. But the community in general regard this, of course, as a short-sighted view, well knowing that the road, by cheapening freights and facilitating travel, will greatly advance every other interest.

The Mining Outlook.

With every week's work the mines here show marked improvement, leaving little doubt but Butte will in the course of a few years become one of the greatest mining centers west of the Rocky mountains. The trouble at this moment is that we have more ore than we can possibly handle with our comparatively few reduction works and limited facilities for transportation. So abundant and so easy of extraction are the ores here that the stock on hand will for a long time most likely be greatly in advance of the means for disposing of it. If our means for treating the ore on the ground were doubled and we had added thereto the advantages of shipment by rail we could still without much strain meet all new demands on the resources of our mines.

Work of the Week.

A few remarks on the present condition and aspect of affairs will sufficiently indicate the progress made here in a general way since my last writing.

On the Moulton, exploratory work and ore extraction have been pushed with accustomed vigor. A heavy flow of water has been struck on the 300 level, indicating the presence of a strong and fertile fissure at that point. No stoping has yet been done here, nor can there be any until the large pumping engine, now on the ground, is gotten in place. Meantime, about 25 tons of first-class ore are being daily raised, a quantity that will be doubled as soon as the 400-ft. crosscut taps the middle vein. The site for the new steam hoist for the west shaft, now on the ground, is being excavated. This mine is coming rapidly to the front, and may perhaps be already considered the most promising in the district.

Of other mines here, it may be remarked, the Alice is taking out and milling her accustomed quota of ore and preparing to declare her usual monthly dividend, a condition of things that will probably be continued for many a month to come.

The Lexington, Stivens, Bell, Gagnon, Original, Acquisition, and a score of other mines of scarcely less note, are all being actively worked, and the majority of them yielding more or less high-grade ore.

The consolidation of the Burnett, Mountain and Buffalo claims, mentioned in my last letter, has just been consummated in the election of the following Directory, viz.: Jas. A. Talbot, President; W. A. Collingwood, Vice-President; R. S. Jones, Treasurer; H. S. Clark, Secretary; Prof. J. E. Clayton, Consulting Engineer. This property has been capitalized at $4,000,000, a large but not an excessive sum in view of its great magnitude and unmistakable value. One-half of the entire stock is to be sold to raise a working capital, thus insuring ample means for opening and equipping the mines, and guaranteeing shareholders against future assessments. The outlook for this company is every way encouraging.

Among the successful men in Butte are to be numbered several old and well-known Californians, some of whom have acquired large and valuable interests, both in the mines and in city property here. It will gratify thousands on the Pacific coast to learn that among those so prospered is Prof. J. E. Clayton, the well-known mining expert and engineer who, coming here early in the capacity of adviser to the Walker Bros., the Salt Lake City millionaires, secured large interests in some of the leading mines, and is now in a fair way of becoming a very rich man.

NEW MONTANA.

Oct. 14, 1881.

Camp Glencoe, Calaveras.

EDITORS PRESS:—This venerable quartz mining camp is still the center of attaction in this part of Calaveras county. Even the U. S. mail stage is now rushed through at the rate of almost three miles per hour. Daily strangers are not a curiosity any more. The larger number are men seeking work. Six boarding houses are crowded. Accommodation in the way of lodging is deficient and when obtained not very desirable.

The Valentine Co. and Norwich Co. are at present the principal fountains of circulating ducats.

The Norwich Co. supply their 18-stamp mill from the stopes of the Norwich mine. This company are also erecting steam power hoisting machinery on the Montana, and have commenced work on the Monte Cristo. The mill is well provided with notices for the benefit of possible visitors that there is "Positively no Admittance."

The Valentine Co.'s new 20-stamp mill is a model of economy in milling. Cars dump the ore on iron-bar grates, the coarser ore descending to the rock-breaker, and the finer material into four of Hendy's challenge self-feeders. Two of Dodge's concentrators are in position on the floor below the batteries, the pulp being finally manipulated by a new style of sluice-concentrator. Here, also, the mysterious "no admittance" greets the visitor. The mill is driven by water power, but 10 stamps only are now in use, as the requisite quantity of water cannot be had for the present. The ore is being extracted from the lower tunnel, but a "no admittance" and a corpulent padlock limited the view of your inquisitive correspondent.

The Mexican mine is still yielding rich specimen ore. The owners intend to work on a larger scale hereafter, as soon as the backs now accessible have been stoped.

The genial owner of the "Kaiser William" mine, Mr. Enright, has at last reached ore in his tunnel which is said to be worth $100 per ton. Mr. Enright (a disciple of our worthy State Mineralogist, Mr. Hanks, I believe) has not alone met all expenses from his own pocket but also develops his muscle and scientific attainments in a thorough, practical manner.

The Foot & Thompson mine near Upper Rich Gulch, has been recently sold to Professor Blake on account of Eastern parties. The vein trends northwest, the mine being near and at right angles with the Mokelumne river, giving the unusual advantage to develope extensively by tunneling on the vein. The property produced enormously years ago, but was eventually involved in litigation until Mr. H. Atwood received a United States patent for the mine. The old mill near the river, which pounded out hundreds of thousands of dollars, finally yielded fine pickings for a company of Chinamen who washed up some $80,000 worth of amalgam which had been lost in milling. Of course John kept the secret until the bonanza was exhausted, but the amount of retorted amalgam sold was sufficient proof.

S.

Calaveras Co., Cal., Oct. 21, 1881.

Mining on the Klamath.

Live and Steady-Going Miners.

Placer operations in this section of Siskiyou county, do not, as in most other parts of California, abate with the advance, and finally cease with the consummation of the dry season. On the contrary, while the most of our large hydraulic companies run steadily through the summer and autumn, the river-bed miners find the latter their most busy season. Thus it comes that even this late in the year the majority of our miners are hard at work, and much gold is being taken out, rendering business of all kinds easy, and preserving it from the fluctuations elsewhere common. And in this connection, it may be observed that some of the houses in this place do a large and varied business. The firm of Camp & Titus, for instance, sell something like $200,000 worth of goods in the course of the year, there being several other traders who dispose of quite a large amount of goods.

The Good Points in our Mines.

Among our nearly uninterrmitting hydraulic mines are the Richardson, the Furguson and Frazier, and various claims about Wingate Hill and Bunker Hill, farther down the river, the Woods, Mucamuc, Chiua Creek, and many others managing to run for a good part of the year. Besides these long working seasons our miners are little interrupted by stopping to run powder drifts, blow up the gravel banks, remove bowlders, etc., there being little of this sort of work here to be done. If capitalists would come up and take a look at the hydraulic mines along the Klamath, they would see a very different state of things from that presented in the counties farther south—no long bedrock tunnels to be run; no hard cement to fight or barren stuff to be removed, rich gravel and plenty of it, an abundance of water easily introduced on the mines and above all no trouble about the debris which runs away into the ocean and harms no one. Conditions that ought to recommend our mines to investors, if they are looking for mines of this kind or if indeed they care to invest in mines at all, for there can be none safer or more profitable than these along the Klamath.

The Wing-Dammers

Are this year reaping a rich harvest in the bed of the Klamath, from which, it is probable, there will be more gold taken out before the season closes than during any previous year. What promises to give new interest and importance to this branch of mining is the fact that it will soon come to be prosecuted by means of tunnels driven under the river bed, or by shafts sunk down to it instead of by wing-damming, the method now in vogue. Should the new plan prove successful it would enable the miner to carry on his work continuously, or nearly so, instead of being forced to suspend it for three-fourths of the year, as at present, besides bringing to him other great gains. Working the bed of the Klamath and Scott rivers though actively carried on for nearly 30 years, is a business that has still a long life before it.

OLD SETTLER.

Happy Camp, Cal., Oct. 20, 1881.

The Hite Mine.

To pen an article giving to this great mine an adequate amount of what it justly merits, says the Mariposa *Gazette*, is almost impracticable for us to reach. Ever since its discovery and location by Mr. Hite, nearly 20 years ago, we have been intimate with the premises, having watched its development and production with great anxiety and interest, with a view to its becoming one of the chief tributaries from which this county was to derive a source of benefit above all others of a mining nature. Our prophecies at the commencement, were that time would develop the fact that this would be one of the best, and rank among the first-class and permanent mines of the Pacific coast. Nearly 20 years have elapsed since work upon this mine first commenced, and notwithstanding the labor of development has been vigorously pushed during that time by Mr. Hite, and a great amount of gold extracted therefrom, the mine at the present, comparatively speaking, is in its primitive state—undeveloped and unexplored. With all the vigor at the command of capital and best management, it will require another 20 years to fathom and develop the resources of this great mine, which will exist and pass into future generations with an increased value above all estimates that can well be calculated at this period of time. The present status of the situation of things at the mine, which is under the control of the "Hite Gold Quartz Crushing Co." a corporation of New York, and managed by Mr. A. J. Bothwell, shows an immence amount of progress, and the Cove is the scene of great activity.

The company has already completed several important improvements, consisting in putting in one of the largest compressors ever made, rebuilding the dam, repairing the flume, putting in new plates and reconstructing the machinery of the mill, and other improvements belonging to the mine and mill generally. In the mine, the work of opening up new levels is to be pushed forward as rapidly and vigorously as improved machinery will permit. A compressor engine has been placed at the lower dam, and a mile of four-inch pipe has been laid to conduct the air to the pump, hoisting engines and power drills in the mine. A large compartment shaft has been sunk below the tunnel level, and will be pushed down without interruption to the depth of 500 ft; levels will be run every 100 ft. The shaft is going down in the west ore body, and all rock taken out in sinking is sent to the mill. The mill has been thoroughly overhauled and repaired, and is now one of the best 40-stamp mills on the Pacific coast. The South Merced river furnishes power to run the mill and compressor. The dams and flumes have just been reinstated for the winter's run. The superintendent expects to complete nearly all his preparatory work during the coming month; after which the development work in the mine will advance with great rapidity. The public here who have known the Hite mine for many years as the best gold producer in the country, expect great results from the mine when worked by improved machinery under a vigorous and capable management.

Of the States and Territories of the Union, California stands No. 1 in the production of gold, quicksilver, sheep, vineyards and barley. She stands No. 5 in cattle; No. 6 in silver and wheat; No. 7 in silk goods; No. 8 in milch cows; No. 11 in coal and hay; No. 13 in potatoes; No. 14 in miles of railway; No. 15 in horses; No. 16 in oats; No. 17 in mules; No. 19 in hogs; No. 21 in iron and steel; No. 28 in corn. Colorado stands No. 1 in silver production, and Nevada stands No. 2 in silver and gold production.

Consolidated Virginia.

Interesting Facts in Its History.

The stock of the Consolidated Virginia mining company first appeared in the San Francisco Stock Boards in March, 1870. During that month it sold between $10 to $17—neither higher nor lower. In July of the same year it sold for $1 per share, and remained at that figure until the fall of 1871; when it advanced to $16. It did not fall below that figure in 1872, and sold as high as $160, and it fluctuated between that sum and $42 during the year 1872.

It was in 1874 that the excitement began, and in that year it sold for $610 per share. In January, 1875, however, it reached its highest figure—$700; California at the same time sold for $780. The capital stock of each company at the time of the two highest prices was 108,000 shares. The companies now have a capital stock of 540,000 shares each.

The Consolidated Virginia mine passed into the present management January 11, 1872. For five years, from 1867 to 1872, a company worked the ground all the time, expending $161,340.41 upon the property without realizing $1 in return. At last it was forced to give way. The new and present management expended $277,150.12 before it yielded them anything. It was a stubborn fight against the heat and barren porphyry—a steady pouring out of gold on a hope, which continued eight years and which would have been abandoned in any other country but this, and by any other class of men in the world except Nevada miners. The last assessment on Consolidated Virginia, levied June 11, 1873, was $3 per share. It was the fifteenth time the stockholders had been called on to pay for the work of exploration and brought the aggregate amount of assessments levied, up to $111,200.

The company paid 53 dividends, aggregating $42,930,000, the last dividend—fifty cents per share—being disbursed in August, 1880. The dividends of Consolidated Virginia and California aggregate $74,250,000.

The Valley of Death.

The Fate of Immigrants on its Burning Sands.

The Valley of Death, a spot almost as terrible as the prophet's valley of dry bones, lies just north of the old Mormon road to California—a region 30 miles long by 30 broad, and surrounded, except at two points, by inaccessible mountains. It is totally devoid of water and vegetation, and the shadow of a bird or wild beast never darkens its white, glaring sands. The Kansas Pacific railroad engineers discovered it, and some papers, which show the fate of the "lost Montgomery train," which came south from Salt Lake in 1850, guided by a Mormon. When near Death valley, some came to the conclusion that the Mormon knew nothing of the country, so they appointed one of their number a leader, and broke off from their party. The leader turned due west, and so, with the people and wagons and the flocks, he traveled three days, and then descended into the broad valley, whose treacherous mirage promised water. They reached the center, but only the white sands, bounded by scorching peaks, met their gaze. And around the valley they wandered, and one by one the men died, and the panting flocks stretched. themselves in death under the hot sun. The children, crying for water, died at their mother's breasts, and with swollen tongues and burning vitals, the mothers followed. Wagon after wagon was abandoned, and strong men tottered and raved and died. After a week's wandering, a dozen survivors found some water in the hollow of a mountain. It lasted but a short time, when all perished but two, who escaped out of the valley and followed the trail of their former companions. Eighty-seven families, with hundreds of animals, perished here, and now, after 22 years, the wagons stand still complete, the iron works and tires are bright, and the shriveled skeletons lie side by side.

PROGRESS OF THE ENGLISH CHANNEL TUNNEL.—A French journal announces the near completion of the first sections on both sides of the submarine tunnel between England and France. On the French side 1,800 meters have been tunneled, and on the English side 1,600 meters, in all over two miles, or about one-tenth of the entire distance. It is proposed at the end of November, to run some experimental trains in the two sections, so as to judge what effect, if any, is produced from the concussion caused by the running trains.

THE NEW TAY BRIDGE.—The total length of the new Tay bridge in Scotland, which will take the place of the one which went down with such terrible loss of life, will be about 10,000 ft., or about two miles. The bridge will be built strong enough to resist more than twice the force of the hardest gale that may sweep against it. The wind-pressure is placed at 21 lbs. per square foot, and allowance is made for 56 lbs.

EARLY SNOW.—On the 13th inst., the snow was flying quite lively for an hour or two as low down in the foothills of the Sierra as Grass Valley.

MECHANICAL PROGRESS.

Mechanical Applications of Electricity.

As was anticipated, the great electrical exposition of Paris is doing a good deal to show the useful capacities of electricity. It is drawing attention to what is inquired for—the motive powor of the future. Steam has done a vast deal for the world; it has heen a great promoter of civilization. It revolutionized manufacturing and transportation. What it has accomplished was scarcely coasidered possible when it was first imporfoctly harnessed to a river vessel. Its progress was rapid and wonderful, aad commerce and civilization have sung pæons to its magaificent advantages.

To-day, says an. exchange, tho world is looking heyond steam. Another motor-power is asked for—is expected. Steam doss not now mest the wants of the age; it spends too much forco for the rosults attainod. It is hecoming costly, and has used up the wood, and is fast consnming the coal that will be wanted for houschold heating purposes. Quicksr travel, less expenss, is tho demaud for the times. Will the demand be met? Ths need is a prophecy that tho thing will he found, for in the march of events, when civilization has needed somsthing moro, it has come. The idea that the new motor is to come from electricty has taken possession of the scientific mind, which therefors is looking in that direction.

But notwithstanding, says another exchaugs, the application of electricity for many practical purposes has grown so rapidly within the last few years, and the success in some fislds has heen so startling and has suggested such possihilities that the general public takes an eager interest in all that rslates to it, and many busy and ingcaious inventors and engineers are working in its varions specialties, and appealing to the masses for aid, they allowed themselves, or others for them, to speak in a sensational style that has done much injury to the cause of real progress; snd it is with much satisfaotion thst we notice a tendency in a hetter and safer direction. Calm examination and ths presentation of specific data are commencing to supersedo the glowiag generalities which often sonnded very ncarly like passages from one of Jules Verne'e works. The public has learned that a very meritorious invention may he unscrnpulously handled hy speculators, and the early enthusiasm has given way to a desire to obtain more and hetter information ou such matters.

The electrical exhibition at Paris is contrihuting much toward that end, and it gives evidence, too, of the efforts making to apply electricity to various departments of mining and metallurgy. At the present early stage of progress, many points are not thoroughly understood, and there ie noticeahlc the absence of cooperation between the electrician and the eagineer; and before the one has fully apprcciated the requirements of the other, and has command of the meane at his disposal, errors will he made, and the new inventions will not have assumed a practical shape. We hear of electrical hammers, rock-drills, elevators, tramways and processes, and it is likely that they will in the near future claim and receive much attention. While there is much that gives promise of ultimate success, and developments onght to he closely watched, it should not he forgotten that all theso appliances will have to go through a period in which means are adapted to the ends. As prohably capahle of adding valuable methode to those now in use for the ntilization of our mineral wealth, engineers will welcome the electricians, hut they should move forward with the caution that past experience has taught them to he necessary.

DAMASCUS STEEL.—Perhaps the hest method which has ever heen discovered for tempering steel, resulting in hardness, toughness, and elasticity combined, is that followed in hardening the hlades of the famous Damascus sworde. The furnsce in which the hlades were heated was constructed with a horizontal slit hy which a current of cold air from the outside entered. This slit was always placed on the north side of the furnace, and was provided on the outside witb a flat funnel-shaped attachment hy which the wind was concentrated and conducted into the slit. The operation of tempering the hlades was only performed on those days of winter when a cold etrong north wind prevailed. The eword-hlade when hright red hot was lifted ont of the fire snd keptin front of this slit and hy this msans was gradually cooled in the draft of air. It acquired the proper degree of temper at the single operation.

HOLLOW STEEL SHAFTS FOR STEAMSHIPS.—Among the recent improvements introduced in Eogland in huilding large steamships, are hollow steel shafts, which are chiefly manufactured hy Sir Joseph Whitworth & Co. On this system a 10-inch shaft has a hole 4 inches in diameter, reducing the weight 16%, while the strength is only diminished hy 2.56%. With a 5-inch central hole these figures would he 25% and 4.25% respectively.

STEEL IN MALLEABLE CASTINGS.—The nse of steel as an addition to the white pig usod in making malleahle castings is increasing ahroad. Scrap ateel has hecn largely used in this country for some time.

Steam Boiler Notes.

A foreign correspondent of the *Scientific American* wishes to know why locomotive hoilers work satisfactorily witb so much lcss steam room per horse power than is nsually found in marine hoilers. He cites good English practice to sbow that fully tbree-fourths of a cubic foot of steam room is allowed per indicated horse power in marine boilers, while only one-eighth to one-twelfth of a cuhic foot is allowed in locomotive hoilsrs, and asks—To what sball the steam room be proportioned, if not to the indioated horse power?

In the above the journal named roplies as follows: The answer to tho first part of the inquiry is,—The greater pressure relatively to ths power developed in the locomotive. But the snhjact does not seem to admit of such categorical treatment as our correspondent ssems to indicate hy the tone of the qnery. Perhaps an empirical rule might he made from a sufficient nnmher of experimants, embracing most of the conditions of modern practice, hut the factors of the problem include everythiag that affects tho rate of evaporation and ths free escape of the steam from the surface of the hoiler water and the steam prssnre. Ths efficiency of the heating surfaces, the ratio of grate to heating surface, the rate of comhustion, ths circnlation of the water, the quantity of water and its depth upon a nnit of heatiag surface, the surface area from which the steam sscapes into the steam space, the pressure upon that surfacs relatively to the power developed hy the engine; and inasmuch as the nnmher and volume of the cylinder charges for cut-off engines are determined, in some degrse, hy ths grade of expansion for a given powor, the point of cutting off ontsrs with the other numerous factors into the problem.

TEMPER OF STEEL.—The temper of steel is due to the chemical union of the iron with ths carhon. At low tamperaturss this union takes plsce only a slight degrce, and hence in soft steel we have the carhon kespiog aloof from the iron; but as the temperature is raised the combination is furthered, until in the case of grsy or glass hard steel we havs really a kind of diamond alloyed with iron. Sudden cooling is necessary to fix the combination; for in slow cooling the carhon separates out again from the iron. This view is supported hy a variety of facts; Mr. Stroth, for example, having ohserved that when an electric spark passes hetween two iron contact pieces and fuses them, the fused part hecomes diamond hard and will scratch a file. Recent researches hy Mr. T. W. Hogg have also led him to a similar conclusion—namely, the tempsr of steel is due to the presence of sn unstahle compound of iron and carhon. The color of the surface of tempered steel depends on the temperatnre, and is dne to the thickness of the film or skin of oxide; the hlue film signifying a higher temperature than the yellow, as well as a thicker coating. In this connection Prof. Hughes has demonstrated that the electric resistance of the film increases with the temperature.

ROLLING OF WIRE AND FINE IRON.—Mr. Julius Schmidt (Schmidt Bros.), of Schwelm, Westphalis, has recently proposed the cold rolling of wire and fine iron hy means of small rollers with eemi-hexagonal grooves, forming a hexagonal section. The application of the hexagonal rollers has the advantage, he says, that the wire or fine iron is always under a central pressure, the structure of the metal will not alter, and the formation of seams is avoided. Each pair of rollings is carricd in little hsarings fixed on a standard. All standards rest on a foundation plate, which at the samo time carries the main standards on which the plunger hlocks for the driving shafts are fixed. The latter serve for the motion of the rollers; the train of wheels is so arranged as to ohtain such speed and direction of motion that the wire will pass through the rollers first one way and the other, or alternately forward and hackward.

AMERICAN CARS ON BRITISH RAILWAYS.—Eacouraged hy the success which has attended the introduction of dining-room cars on the Great Northern railway, the Midland railway company have decided to follow in the same direction. They intend to place a dining-room car on all their express trains rnaning hetween London, Manchester and Liverpool. These cars are to he made hy the Pullman Palace Car Co. The same company are making several new palace cars for the London, Brighton and South Coast railway. Since the Brighton tragedy, the demande made upon the Pullman car accommodation have heen so great as to he in excess of what is at present at the disposal of the company. The directors have consequently decided to run a train cach way every day, to he composed entirely of Pullman cars.—*London Times.*

HEAVY PLATE ROLLING.—In Sheffield, Eugland, a few weeks since, the apectacle was witnessed hy a number of distinguised visitors, of rolling a huge ateel-faced plate for a government war steamer now building. The process, known as the Ellis patent, was satisfactorily completed in a quarter of an hour. The weight of the plate was 30 tons 16 cwt., and the length 10 ft. 4½ inches; hreadth, 8 ft. 9 inches; and thickness, 19 inches. Afterward, the visitors witnessed the flanging of marine hoiler ends by hydraulic pressure in one operation.

SCIENTIFIC PROGRESS.

Interesting Mineral Discoveries in Arizona.

Prof. B. Silliman records in the *American Journal of Science*, the discovery of vanadinits and other crystalline salts of lead, of great heauty of color and perfection of form, in the Territory of Arizona. Some of the varieties—crocoite, a chromate of lead, and vanquilinite, a varisty containing copper—have never hefore heen found in North Amorica. Vanadinite, chloride of lead and vanadium, hitherto a rare species, promise now to be comparatively ahundant in the silver district in Yuma county and other localities.

It is fonnd in veins of quartz which lie hetween footwalls of granite and hanging walls of porphyry, the latter heing similar to the usual associates of silver ore the world over. The quartz veins have also other salts of lead and argentiferous galena, hut no gold. Vanadinito occurs in the Hamburg, Red Cloud and Princess miaes. That in the Hamhurg is the hest. The crystals are small and highly lustrous, varying in color from deep orange-red to reddish yellow and hrown.

In Red Cloud they are a rich flame color, and are fonnd in rathar confused masses. In Princess mine ocenr slender crystals of a hrilliant red color hedded in white calcite. They are very perfect in form, and have heen mistaken for chromate of lead.

Other rare speoies are found in the Vulture district, in the vicinity of the Vulture mine, while at Collateral mine, about 25 miles northeast of Vulture, is the most interesting locality. The vein is ahont 4½ ft. wide in soft gray talcose rook. About one-half of the thickness of the vein is qnartz, stained green with chrysocolla and chocolate hrown with ground mass which contains vanadium. The colored masses all give strong reaction for vanadic acid.

The whole soft mass of the vein reacts for vanadic acid, and specimens of rare heauty are found in the cleavage fragments of ths calcite.

Among the ores found in this "Collateral" minc is a mineral which may prove to he descloizite. The tests of it indicate the presence of vanadium, lead, copper, manganeese and zinc, hut more specimens are needed to complcte the study of it.

A specimon is referred provisionally to the Volhorthite species.

This mineral has a green color, and contains copper, lime, and vanadic acid. It was named after Volborth, its diecoverer; hut tho specimen discovered in "Collateral" mine may turn out to he a new species.

A mineral like Domeyko's *chileite*, but not a clay-like mineral, which yields a glohule of lead containing a nucleus of copper, occurs both in this miue and in the "Chromate," and something similar is found in the "Phœnix" mine. The Montezuma lead mine ahounds in vanadinite in the form of hexagonal prisms.

What may prove to he *mottramite* has heen found at the "Frenchman's" mine. Wulfenite, molyhdate of lead, which does not contain vanadic acid, has heen found in crystals of rare heauty in "Red Cloud" mine, as well as the vanadinite hsfore mentioned. It is also found in the "River" mine.

Three or four speoies of the *crocoite* group, that is, chromic acid with oxide of lead, occur in the "Collateral" and the "Chromate" veins, hut as yet it has not heen found well crystallized. Before the study of these interesting localities can he complete a personal visit must he made hy a mineralogist to the mines, and sufficient material ohtained on the spot to allow of a chemical analysis.

THE most powerful artificial light in the world has just heen constructed hy Messrs. Chance Bros. & Co. at Smethwick, near Bermingham, Eng., for the South Head lighthouse, near Sydney, New South Wales. It is called a first order, dioptric, revolving light, with the electric arc. The lamp has a special arrangement of prisms for securing vertical divergence of the heam. It is over six ft. in diameter, and the hight is ahout nine ft., and it is said to be the first time such dimensions have heen applied to illumination hy the electric arc. The lamp has a power of about 12,000 candles in the focus of light, and the merging heam has a luminous intensity exceeding 12,000,000 candles. The light will give flashes aronnd half the horizon at intervals of a minute, and will make a complete revolution every 16 minutes. On an aversge, the light will he visihle a distance of 40 to 50 miles. At an exhihition of its power recently given at Smethwick, the light was so intense that it could hardly he endured hy the naked eye.

SUPPOSED NEW SPECIES OF HORSE.—M. Poliakoff, the distinguished Russian naturalist, has examined a horso presented hy Col. Prejvalsky to the St. Petershurg Academy, and decides it to be a new species, which he has named Equus Prejvalekii. It appears that the new representative of the family of undivided-hoofed mammals is in some respects intermediate hetween the domestic horse and the wild ass, but it differa from the asinine genus, in having four callosities, one on each leg. In the form of akull, absence of dorsal stripe and other particnlara, it resemhlea the horse. Thia newly recorded animal is indigenoue to plains and deserts of Central Asia, and has not hitherto fallen under the dominion of man,

CASTINGS OF DELICATE NATURAL OBJECTS.—Ths following process is recommen led hy Ahhas for prodncing metallic castings of flowers, leaves, insects, etc.: The object, a dead beetle, for example, is first arranged in a natnral position, aad the feet are connected with an oval rim of wax. It is then fixed in tho center of a paper or wooden hox hy means of picces of fine wire, so that it is perfectly free, and thicker wires are run from the sides of the hox to tho ohject, which suhsequently serve to form air channels in tho mold hy their removal. A wooden stick, tapering toward the hottom, is placed upon ths back of the insect to produce a runner for casting. The box is then filled up with a paste of three parts of plaster of Paris and ons of brick dnst, made up with a solution of alum and ssl ammoniac. It is also well to first hrush the object with this paste to prevent the formation of air hubhles. After tho mold thus formed hss set, the object is removed from the interior hy first reducing it to ashes. It is therefore dried slowly, and finally heated gradually to a red heat, and then allowed to cool slowly to prsvent the formation of flaws or cracks. The ashes are removed hy pouring mercury into the cold mold and shaking it thoroughly hefore pouring it out, aod repeating this operation several times. The thicker wirca aro then drawn out, and the mold needs simply to be thoroughly heated before it is filled with metal, in order that tho lattar may flow into all portions of it. After it has become cold it is softened and carefully broken away from the castings.

THE COMET AS SEEN FROM A BALLOON.—M de Fonvielle has described the appearance of the great comst as seen from a balloon on tho occasion of his recent ascent at midnight. Tho hrightness of the comet increased as the balloon ascended, this increase of hrilliancy heing very marked. The tail appearsd a little loager thsn when seen from the earth's surface, hut most remarkahle was the manner in which it terminated, for it was cut off straight, as if a line were drawn over it horizontally with a rulor. The appearance of the tail was as if prodnced hy myriads of largs stones taaveling in planetary space independently of the comet, and having no other connection with it than that of heing temporarily lighted hy the rays which its atmosphere had canssd to deviate, more or lcss, from their natural course. This multitude of fragments of other worlds would, therefore, produce the same effect as dust lighted by a ray of sunlight admitted into a dark room through a crevice. M. de Fonvielle expounds this theory at some length. He also insists upon the importance of hallooning in astronomic investigations.

PROGRESS IN PRACTICAL SCIENCE.—Tbe astonishing speed with which revolutions in practical science succeed each other in the present age is indicated hy the fact that already eminent scientific men have hegun to predict the disappearance of the steam engine, whose rise scarcely dates hack heyond the memories of our own generation. At a recent meeting of the British Association, some of the leading members argued that the steam engine has already had its day, and will be superseded hy some motor which does not expend so much force with so little result. What that power shall be, the distinguished scientists do not seem to have predicted, although many eyes are turned toward electricity as the probable motor of the future. We are not yet prepared, however, to relegate steam power to ohlivion, although it is admitted that in its production there is an absolute loss of much the largest percentage of the efficiency of the fuel employed.

A REMARKABLE COMET.—Prof. Klein, an astronomical ohserver at St. Louis, Ky., makes the followiag statement, under date of Octoher 18th: "I have, for several weeks past, noticed a singular phenomenon in the heavens, in the shape of a double comet, or comets, attended with nine smaller ones all in a circle, closely resemhling one of Saturn's rings. They all appear to he connected, as they move in the same orhit, and the larger of the double comets will at regular intervals eclipse the smaller one, and the little ones are on snch occasions lost sight of in the mist thus created. I have no doubt that this is the comet of 1845 and '46, supposed to have hesn destroyed. This, too, I helieve to be the comet of 1811, having a period of 35 years. Aside from this wonderful comet, or rather, 11 comets, there are five others now visible.

THE ELECTRIC LIGHT ON HEALTH.—Experiments by German scientists in ascertaining the peculiarities of the electric light, establish the fact that it is not only healthier than other methods of illumination in leaving the air purer, hut that it increases the power of the vision in some respects, especially in distinguishiag colors. Red, green, hlne and yellow are made much more distinct and marked under this light than hy daylight.

CONVERTING POWER OF THE POTATO.—Dr. J. B. Laws, of Rothamstead, Eagland, says that the potato possesses the property of converting a very much larger portion of the manure ingredients of the soil into human food than any of the cereal grain crops. For instance, to every hushel of wheat, ahout 100 lbs. of straw are grown, while the haulm of the potatoes when dry, is so light, that in experimenting we do not think it worth while to weigh it.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Oct. 6.		Week Ending Oct. 13.		Week Ending Oct. 20.		Week Ending Oct. 27.	
Alpha	3½	3	3½	3⅛	3.80	3⅜	4.40	3.90
Alta	5½	4.35	4.90	4.55	4.55	4.35	4.40	3.95
Andes	2	1.60	1⅞	1.70	1¾	1.60	1.65	1.55
Albion	2½	1.90	2½	2	2.40	2⅛	2.30	2.05
Argenta	....	....	....	....	5c	....	5c	....
Addenda	15c	....	15c	10c	10c	....	10c	....
Belcher	2½	1.85	2.05	1.90	2	1.90	2.10	1⅞
Belmont	....	....	....	....	....	....	40c	....
Best & Belcher	14⅜	11⅞	13⅜	12½	13	12⅜	12⅜	11⅛
Bullion	80c	50c	65c	55c	75c	65c	1.90	65c
Bechtel	80c	70c	75c	70c	75c	70c	75c	50c
Belle Isle	....	....	....	....	....	....	....	....
Bodie	9	6⅜	8¼	7⅜	8	....	7⅛	7¼
Benton	1.05	75c	90c	60c	80c	75c	70c	65c
Bulwer	2½	1⅞	....	....	....	....	....	....
Boston	5c	....	5c	....	25c	5c	....	....
Black Hawk	10c	....	5c	....	5c	....	....	....
Belvidere	10c	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	20c	10c	10c	....	10c	5c	25c	15c
California	1.10	95c	1	90c	95c	90c	90c	70c
Challenge	90c	65c	70c	....	....	....	....	....
Choller	2⅜	2.45	2½	2.30	2.65	2.45	2.40	2.05
Confidence	3	....	3⅜	3	3⅜	3.45	3⅜	3
Con Imperial	20c	15c	20c	15c	25c	20c	25c	20c
Con Virginia	2⅜	2.40	2.55	2.35	2.55	2.45	2.45	2⅛
Crown Point	1.40	1.1	1.85	1.70	1.85	1⅞	2.05	1.90
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1.15	1	1	....	1½	1	....	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2.45	2⅛	2½	....	2.40	....	2½	2.20
E. Mt. Diablo	35c	20c	20c	....	20c	....	20c	15c
Eureka Con	25⅛	25	22	20c	21½	18	16	15
Exchequer	1.10	85c	1½	90c	1⅛	1.20	1⅛	1.35
Endowment	....	....	....	....	....	....	....	....
Grand Prize	25c	10c	15c	10c	5c	....	15c	....
Golden Gate	....	....	2.60	....	2⅛	....	....	....
Goodshaw	40c	35c	35c	....	25c	....	35c	30c
Gould & Curry	8¼	6⅜	8⅛	7⅛	7⅜	7⅛	7⅜	6¼
Hale & Norcross	3.70	3	3½	3.05	3.40	3.15	3.20	3
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
ndependence	....	....	....	....	15c	10c	10c	....
Julia	20c	10c	15c	10c	40c	10c	45c	40c
Justice	95c	70c	75c	65c	1½	90c	95c	90c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2½	....	2½	....	2½	....	2½	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	20c	15c	20c	15c	....	....	20c	15c
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	1⅜	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	2.10	1½	2½	1½	2.10	2.05	3.30	2.35
McClinton	....	....	....	....	....	....	....	....
Mono	3.10	2	2.60	2	2.35	2	2.20	1⅛
Mexican	10½	8½	9⅜	8½	9⅜	9¼	9⅛	8
Mt. Diablo	6	5⅜	6	5¼	5	....	5¼	5
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	20c	5c	20c	5c	6c	....
Noonday	50c	25c	60c	50c	50c	30c	55c	25c
New York	....	....	10c	5c	10c	5c	15c	1c
Northern Belle	12	11⅜	12⅜	11⅜	11⅜	11¼	12	11⅛
North Noonday	30c	25c	40c	30c	35c	....	5c	....
Navajo	....	....	60c	....	50c	....	45c	....
Occidental	1⅜	1.30	1⅜	1.40	1.40	1⅜	1¼	1.30
Ophir	7⅜	6	7⅛	6⅜	7⅛	6⅜	6¼	5⅜
Original Keystone	....	....	....	....	....	....	....	....
Overman	1⅜	1.20	1.65	1.45	1.80	1.45	2.65	1.95
Oro	75c	70c	70c	60c	60c	40c	40c	30c
Paris	....	....	....	....	....	....	....	....
Potosi	3⅛	3	3	2.80	3.10	2.85	2.90	2⅝
Quen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	3.30	2.60	4.05	3.40	4⅛	4.10	3.90	3.70
Seg Belcher	7⅛	....	7⅞	7⅛	7⅜	7	9	8
Sierra Nevada	19	12⅜	16½	14⅜	16⅛	15	15	13⅜
Silver Hill	30c	20c	30c	25c	30c	25c	30c	25c
Silver King	17⅛	17	18⅛	18⅛	18	17⅜	19⅛	18⅜
Succor	....	....	....	....	....	....	....	....
Summit	15c	....	....	....	20c	....	10c	....
Scorpion	2.10	1⅛	1.60	1.65	1⅛	1.70	1.85	1.45
Solid Silver	45c	40c	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	....	....	40c	....	40c	....	....	....
Tioga Con	45c	35c	50c	35c	30c	20c	20c	....
Tiptop	6	....	6	5⅜	5⅜	....	5⅜	....
Tuscarora	25c	....	20c	15c	10c	....	10c	....
Union Con	14	12⅜	14⅛	13⅜	15	13⅜	14	13⅛
Utah	9⅜	7⅛	8⅛	7⅜	7⅞	7	7	6⅜
Ward	....	....	2½	....	....	....	3	2½
Wales	....	....	75c	....	50c	....	40c	....
Yellow Jacket	4⅜	4.10	4.30	4.15	4.40	4.30	4.35	3⅜

Sales at S. F. Stock Exchange.

Thursday A.M., Oct. 27.

50 Andes.....1.55
300 Alta.....4
400 Belcher.....12@1.80
170 B & Belcher.....11⅛
360 California.....80c
20 Con Virginia.....2.40
110 Chollar.....2.05
50 Crown Point.....2
170 Gould & Curry.....6⅞
30 Hale & Nor.....3
330 Lady Wash.....15c
250 Mexican.....8⅛@8
1000 New Wells Fargo.....10c
60 Ophir.....5⅜
800 Overman.....2.35@2.30
75 Potosi.....2⅛
665 Savage.....3.90@3.85
140 Scorpion.....1⅛
15 Seg Belcher.....8
360 Union.....13⅜
60 Yellow Jacket.3.90@3.85

AFTERNOON SESSION.

350 Albion.....2.15@2⅛
530 Bodie.....6⅛@6⅜
750 Beebtel.....25c
150 Bodie Tunnel.....1.35
150 Belmont.....50c
100 Concordia.....1⅛
450 E Mt Diablo.....30c
180 Goodshaw.....30c
300 Holmes.....40c
125 Mt Diablo.....6
250 M White.....2⅛
85 Mono.....1.55@1⅝
610 Noonday.....45@40
800 N Noonday.....25@30c
50 Oro.....35c
130 Pinal.....4⅛
200 Star.....25c
150 Tioga Con.....25c
100 Wales.....50c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Germania, Oct. 18, $3,500; Hanauer, 18, $2,300; Horn Silver, 20, $7,500; Barbee & Walker, 20, $1,826; Horn Silver, 19, $7,500; Hanauer, 19, $2,200; Wood River, 19, $2,250; Germania, 20, $6,400; Stormont, 20, $3,080; Great Basin, 20, $4,100; Horn Silver, 22, $10,000; Mammoth, 20, $2,698; Barbee & Walker, 22, $2,880; Hanauer, 22, $2,200; Wood River, 22, $2,200; Alice, 23, $6,000; Horn Silver, 23, $10,000; Monitor M. & M. Co., Taylor district, from Oct. 20th to 25th, $7,242.97; Wai Wera Con., 18, $3,206; Christy, 23. $3,648; Bodie Tunnel, for October, $5,000; Western Belle, 17, $11,200; Northern Belle, 19, $5,350; Silver Belt, 21, $30,000.

CALISTOGIANS, firm in tho belief that there are large quantities of gold and silver in old Mount St. Hslena and vicinity, are not going to allow the embarrassments attending their recent sfforts to establish a quartz mill in their town, to end the enterprise. The *Calistogian* says a mill will be constructed there without delay, the machinery having already been ordered.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Bodie Tunnel & M Co	California	5	50	Oct 20	Nov 24	Dec 21	C C Harvey	304 California st
Benton Con Co	Nevada	6	25	Oct 14	Nov 18	Dec 8	W H Watson	302 Montgomery st
Belcher M Co	Nevada	28	1 00	Sept 29	Nov 1	Nov 24	J Crockett	327 Pine st
Belle Isle M Co	Nevada	3	10	Sept 13	Oct 18	Nov 8	E M Hall	327 Pine st
Boston Con	California	2	20	Sept 15	Oct 21	Nov 12	F D Luty	330 Pine st
Bullion M Co	Nevada	21	1 00	Sept 21	Oct 26	Nov 15	J M Brazell	328 Montgomery st
Belvidere M Co	California	12	25	Sept 20	Oct 29	Nov 21	C Y Hubbard	310 Pine st
Champion G & S M Co	California	9	25	Sept 19	Oct 25	Nov 15	B Burns	309 Montgomery st
Crown Point G & S M Co	Nevada	45	75	Sept 7	Oct 12	Nov 2	Jas S Newlands	327 Pine st
California M Co	Nevada	2	10	Oct 4	Nov 9	Nov 30	E F Stone	306 Pine st
Caledonia M Co	Nevada	27	25	Sept 29	Nov 2	Nov 22	R Wegener	
East Mt. Diablo	California	2	10	Sept 27	Oct 31	Nov 21	C W Fisher	324 Pine st
Eintracht G M Co	California	8	05	Sept 27	Nov 1	Nov 19	H Kuntz	209 Sansome st
Exchequer M Co	Nevada	17	25	Sept 8	Oct 12	Oct 31	C E Elliott	327 Pine st
Goodshaw M Co	California	9	15	Oct 12	Nov 17	Dec 8	Chas O Harvey	309 Montgomery st
Grand Prize M Co	Nevada	7	25	Sept 30	Nov 1	Nov 21	E M Hall	327 Pine st
Hale & Norcross M Co	Nevada	71	50	Oct 6	Nov 9	Dec 1	J F Ligbtner	Montgomery st
Home G M Co	California	3	3	Oct 20	Dec 3	Dec 21	R Ellen	330 Pine st
Harrington M Co	California	2	05	Jnn 15	Oct 14	Nov 5	O C Miller	409 California st
Julia Con M Co	Nevada	16	30	Sept 16	Oct 21	Nov 11	H A Charles	419 California st
Justice M Co	Nevada	35	25	Sept 13	Oct 18	Nov 8	R E Kelly	419 California st
Lord of Lorn M Co	Nevada	2	10	Oct 8	Nov 17	Dec 19	R N Van Brunt	318 Pine st
Maybelle Con M Co	California	9	20	Sept 20	Oct 26	Nov 18	W J Taylor	310 Pine st
Murchie G & S M Co	Nevada	7	25	Sept 7	Oct 11	Nov 10	Wm Lettie Oliver	328 Montgomery st
Mexican M Co	Nevada	17	00	Oct 4	Nov 8	Nov 28	C L McCoy	309 Montgomery st
Mono M Co	California	14	10	Oct 4	Nov 9	Nov 29	W H Lent	309 Montgomery st
May Flower Gr M Co	California	13	10	Oct 12	Nov 16	Dec 7	J Morizio	328 Montgomery st
Morning Star M Co	Nevada	1	25	Oct 19	Nov 22	Dec 21	J B Mcholm	331 Montgomery st
Mt Potosi M Co	Nevada	8	25	Oct 20	Nov 21	Dec 12	W J Taylor	330 Pine st
North Noonday M Co	California	4	25	Oct 26	Dec 1	Dec 23	W J Taylor	330 Pine st
Noonday M Co	California	4	25	Oct 26	Nov 29	Dec 20	W J Taylor	330 Pine st
Ophir M Co.	Nevada	40	1 00	Sept 30	Nov 3	Nov 23	C L McCoy	309 Montgomery st
Overman S M Co	Nevada	51	50	Oct 17	Nov 17	Dec 8	G D Edwards	414 California st
Quartz Mountain M Co	California	13	75	Oct 7	Nov 14	Dec 5	E Hestris	729 Montgomery st
Rocky Point M Co	California	9	05	Oct 12	Nov 14	Dec 5	D M Kent	330 Pine st
Sierra Nev S M Co	Nevada	70	1 00	Oct 6	Nov 10	Nov 29	E L Parker	309 Montgomery st
Tuscarora M & M Co	Nevada	9	15	Oct 17	Nov 22	Dec 14	M E Sperling	300 California st
Utah S M Co	Nevada	36	2 00	Oct 13	Nov 16	Dec 6	G C Pratt	309 Montgomery st
Union Con S M Co	Nevada	18	1 00	Oct 10	Nov 14	Dec 5	J M Buffington	309 Montgomery st
Wide Awake M Co	Arizona	14	10	Sept 16	Oct 21	Nov 12	C Hildebrandt	Bush & Kearny sts
Yellow Jacket S M Co	Nevada	42	1 00	Oct 4	Nov 9	Dec 6	N Otey	

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Bengal M Co	Arizona	1	02	Aug 31	Oct 7	Oct 29	J H Sayre	330 Pine st
North Sierra Nev Co	Nevada	3	10	Sept 19	Oct 27	Nov 17	C C Harvey	309 California st
South Hite M Co	California	2	10	Sept 1	Oct 5	Oct 29	T A Berlin	515 California st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Mreting.	Data
Alexander M Co	——	A B Cooper	328 Montgomery st	Annual	Oct 31
Curtis Con M Co	Nevada	H S Stone	328 Montgomery st	Aunual	Nov 11
Gold Lead G & S M Co	——	D Frankladcs	331 Montgomery st	Annual	Nov 4
Happy Valley G M Co	California	D M Kent	330 Pine st	Aunual	Oct 24
Homer M & M Co	California	F D Luty	330 Pine st	Annual	Oct 28
Ida M & M Co	——	B F Dahl	331 Montgomery st	Annual	Oct 25
North Noonday M Co	California	W J Taylor	330 Pine st	Annual	Oct 26
Shawmut G Q M Co	——	J S Bacon	316 California st	Aunual	Oct 27

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Oct 27
Father Do Smet M Co	Dakota	H Dean	New York	50	Oct 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Oct 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Oct 15
Silver King M Co	Arizona	J Nash	315 California st	25	Oct 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Oct 12
Tip Top M Co	Arizona	H Deas	309 Montgomery st	20	Aug 25
Western M Co	California	C S Curtiss	309 Mo ntgomery st	75	Sept 10

The Mining Share Market.

The mining share market still remains dull and uninterssting. There is considerable hopo among many that a development will take place on the Comstock before long. Tho fact that John Mackay has started back here from Europe may have helped this impression.

There is talk of the hydraulic pumps at the Cholla-Norcross-Savage shaft being run here after hy natural pressure. It can he done hy using the water of the Virginia and Gold Hill Water Co. The matter is under discussion at present, and the only question of feasibility is the one of economy—whether it will he cheaper to huy water or firewood.

The first hulkhead in the drift leading from the Chollar-Norcross-Savage shaft into the Savage ground on the 2400 level has been removed. The mner portion was hlasted out, leaving the sides and top stand. As the entire hulkhead was of solid masonry, the remaining portion will add to the support of the ground, be side heing already in place in case it is found necessary to again hulkhead the drift. The flow of water was slight aud easily handled by the hydraulic pumps at the Combination shaft. This was owing to its having been drawn off hy the opening of a valve for tho hulkhead. The drift is found to he in good condition, aud it will not bs long hefore the second hulkhead is removed.

The total length of the drift is 721 ft., and the second bulkhead is pretty well in toward its face. From the face of the drift there remain 160 ft. to he run to meet the point where the main incline will strike the 2400 level, and the distance the incline yet has to go to reach said level is, according to the map, just 58 ft. Thus it will hs seen there is no very great amount of work to he done to make this very important connection.

The opening of this drift will not only cool the lower levels of the Savage, but will also he of great henefit to the Hale & Norcross, Chollar and Potosi as well.

Meetings and Elections.

Meadow Valley M. Co. Oct. 22: Directors, R. Wegener (President), George D. Edwards (Vice-President), W. W. Stetson, E. V. Joice, James McCora. The other officers elected were J. R. Duff, Superintendent; Bank of California, Treasurer; N. DeLaguna, Secretary.

Happy Valley Blue Gravel M. Co., Oct. 24: Directors, C. W. Banks, F. A. Berlin, N. Oray, S. Heydenfeldt and S. Foorman.

Silver Lick Con. M. Co., Oct. 24: Directors, Benj. Nealey (President), John J. Roach, Adolph Schander (Vice-Presidente), L A. Booth, John Sinclair. John Dcsbeck was elected Treasurer and J. W. Pew, Secretary.

Syndicate M. Co., Oct. 20: Directors, Charles H. Fish, George W. Hopkins, R. N. Gravcs, Robert Sherwood and H. M. Yerington. At a subsequent meeting of the Directora the following officers were elected: Chas. H. Fish, President; George W. Hopkins, Vice-President; H. M. Yerington, Treasurer; R. K. Colcard, Superintendent, and Jacob Statfeldt, Jr., Secretary.

SALT LAKE CITY is filling up with miners, who come to spend the winter months there.

Electricity for Power Underground.

On tbis coast the "pony boists," drills, etc., used in underground work in mines, aro generally run hy compressed air, led to these machines from air compressors on the surface. Steam is also usnd, but the compressed air is much preferahle for obvious reasons. Many persons have imagined that some day an application of electricity for the transmission of power would he devisnd, by means of which fans, etc., could he worked underground. We see that this idea has been put in practice in France. M. Mathet has submitted the details to the *Societe de l'Industrie Minerale*. The St. Claude shaft at Blanzy was sunk to the depth of 500 meters (1,640 ft.), for the purpose of searching for a faulted portion of the coal seams, and a heading was run from it across the strata. When this heading had reached a length of 400 meters (1,312 ft.), the ventilation became so poor that the temperature at the face rose to 95° Fahr., and the miners could work only for a few hours. After some ineffectual attempts to improve the ventilation hy simple means, it was decided to put in a fan 2.63 ft. in diameter, and run it by power transmitted hy electricity. An 8 to 10 horse power portahle engine was put up above ground, and, with a Gramme dynnmo-electric machine, was run at a speed of 1,200 revolutions per minute. The electric current thus generated was condncted by a cable, consisting of seven 0.044-inch copper wires, to a second Gramme machine coupled directly with the fan, and placed in the heading near the shaft. Running at 700 to 800, it required 2½ horse power, the useful effect heing at least 60%. The temperature at the face was only lowered 5°, hnt the men could work in eight-hour shifts. The return current was conducted from the underground machine hy an iron wire cahle. The cost of the whole plant is stated to have been only one-third of what a machine for delivering compressed air to the heading would have required.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

NEVADA CONCENTRATION CO.—Oct. 20. Capital stock, $5,000,000, divided into 500,000 shares. Directors—L. T. Lazure, Morris Hoeflisch, Oustave Frank, Willard G. Farwell, John Landers, Stephen G. Clark and John A. Bagley. The principal place of business will be in San Francisco.

RANSOME MANUFACTURING CO.—Oct. 26. Object: Manufacturing brick, stone and other material. Capital stock, $100,000, in 10,000 shares. Directors—E. L. Ransome, O. Alexander, C. E. Royce, A. A. Wigmore and H. Beveridge.

SIERRA MILLING, SMELTING & M. Co.—Oct 21.—Location, California. Capital stock, $10,000,000. Directors—L. Osborn, J. F. W. Veat, Robert O'Neill, W. J. Collins and Edwin Lewis.

QUINN M. Co.—Oct. 24.—Location, Nevada. Capital stock, $10,000,000. Directors—Josiah Howell, Walter M. Rockwell, W. W. Bausman, Emanuel Epstein and W. W. Stetson

MINING SUMMARY.

The following is mostly coudensed from journals published in tbe interior, in proximity to the minee mentioned.

CALIFORNIA.

AMADOR.

ETNA.—Cor. Amador *Sentinel*, Oct. 20: I made a flying visit a few daye ago to the Etna mine, which is situated on the bead of Grizzly gulch between the middle fork of the Cosumnes river and Spanish creek, 2 miles from where the latter empties into the river. It was discovered in 1879 by the Hite brethers while working placer diggings, and was called the Hite, Centeunial, or the Sulphurets mine, but ie now called the Etna. Spasmodic efforts bave been made to develop this mine during the past five years, but nothing thorough had been done until the past few months. The Etna Co. of Sacramento has put up hoisting works and sunk to a depth of 150 ft. The ore taken from this mine is different from anything known in this State and perhaps in the world, although it is said that there ie similar ore at Leadville, Colorado. It is a kind of gray sandstone, looking like fine concrete, and is thickly studded with sulpburets of iron, from the size of a pin point to that of a walnut. The ore taken out assays from $100 to $1,000 per ton. The parties working it have the utmost confidence in the mine and will erect a mill and reduction works as eoon as possible. The lead has been traced for 3 miles north, but there are no indications of it soutb of the Etna. A. Hayward is reopening the old Simmington mine, situated 500 ft east of the Empire. This mine was first located something over 20 years ago by John Simmington, who worked it periodically for 6 or 7 years, until he got mixed up with the killing of a Spaniard on Bishop flat (now Vanderpool's ranch), and left between 2 days, since when he has never been heard of. The mine has been worked occaeionally eince, a shaft 60 or 70 feet deep having been sunk. It is now owned by A. Hayward and J. Woolford. The latter has bonded his interest to the former, who has erected a whim and intends thoroughly prospecting the mine. Some people think that this is the mother lode and that the Empire is a kind of a hump hanging on the eide of it. Well, euch humps are convenient to have on hnud.

FROM SUTTER CREEK.—Cor. Amador *Ledger*, Oct. 22: The last set of tiubers was placed in the shaft of the Amador Consolidated on Monday night. Prospecting for the ledge will be inaugurated as soon as possible. It is intended first to prepare a place to store the debris loosened during the night shifts, so as to hoist only during tho day time, as it is tbought that all the rock extracted during the 24 hours can be easily raised to the surface during the hours of daylight. Drifts will be run, we understand, in 3 different directi ns. While sinking has been in progress 12 men have been employed, working in 3 shifts, of 8 hours each. When drifting has fairly commenced, it is thought this force will be materially increased. The Median mine at Amador City is keeping the Talisman mill running steadily. The copper plates are said to indicate that the rock is turning out handsomely.

VOLCANO.—Amador *Ledger*, Oct. 22: That Modoc rock that was crushed at Mace's mill has been all the talk for some time. The first crushing was a run on 100 tons, and everyone expected something big in the clean-up, for rock that will assay over $10 per ton surely ought to mill over $30. But just imagine the surprise when it was found that the average per ton was $9.50. The last crushing was 373 tons, and during the run 2 special watchmen were placed in the mill, the result being that 90 ozs of gold were cleaned up and brought to town last night. It seeme quite a difference when it is remembered that all this was the same quality of rock. The V. G. G. M. Co. are making every preparation for a big run during the winter. They are having an immense reservoir built to hold water when the rains have ceased. Sinking tho shaft at the Golden Gate continues with flattering prospects. The Downs mine may s.art up some time in the near future. Several new ledges are being prospected around in the hills.

MISCELLANEOUS.—A vein of rich ribbon rock was struck in the Morgan tunnel last Tuesday. Samples shown in Jackson look encouraging. We are glad to be able to state that good ore is being taken from the Kelly mine, in Hunt's gulch, lately purchased by Boston capitalists. Two experts are at the Amador Oravel Co.'s claim, overhauling the books showing the transactions for the last 2 years.

CALAVERAS.

BIG NUGGET.—Calavcras *Chronicle*, Oct. 20; Mr. Chas. Schlund, banker in this place, has on exhibition at his place of business a nugget of solid gold, obtained from one of the claims in this vicinity, weighing $200. Such *chispas* are a little rare now-a-days, but they have not all been taken out yet, it seems. It is a very nice thing to look at, and much nicer to have. We wouldn't mind having a few such pieces

GRAND ENTERPRISE.—*Mountain Echo*, Oct. 18: The Union Water Co. have just completed their re ervoir, located about 40 miles east of Murphys. It is a massive structure built somewhat in the form of a pyramid with wings extending from the base. One of the wings is 900 ft in length, 18 ft thick at the base, and 7 ft at the top. The main dam over the river is 175 ft in length, 34 ft thick, and 9 ft on the top This grand structure will cover an area of 8,000 acres, and will average from 8 to 20 ft in depth. The cost of this work is estimated at $10,000. There will in future be no lack of water for mining pusposes, and it is to be hoped that the hardy miners will do their utmost to develop the minee.

DEL NORTE.

COAL AT POINT ST. GEORGE.—Del Norte *Record*, Oct. 10: The work of prospecting for coal at Point St. George is being steadily pursued, and the progress so far made is as good as might be supposed, since the work is done entirely by hand. Although the party, with Mr. P. Emmetsburg at the head, during the 2½ months they have been engaged, have encountered numerous difficulties, in the way of bad ground, insufficiency of implements, etc., they have penetrated to the depth of 183 feet, and for half that depth bad, up to Sunday last, put down the pipe (the diameter of which, being the same as that of the hole, is five inches), which, in any manner of ground, becomes necessary to do good boring, or to carry on the work with any degree of safety against accidents that might occur in caving or filling in. During the fore part of the present week the men were busily engaged in pumping and priming out the cut, preparatory to extending the pipe about 80 ft farther down, after which their intentions were to again resume boring. At a depth of 170 ft their labors were rewarded by the bringing up of "outcroppings," of a reasonably good quality, from what was supposed to be a vein about a foot thick. The vein, or layer or aand coal, was then lost, but its discovery gives foundation for their hopes and affords excellent prospects, of their early striking a main, or a larger lead. Together with this fact may be mentioned that of there being plainly visible at low tide in the winter season, when it is not covered with sand, a large cropping out of the ledge a short distance out in the ocean opposite the place where work ie at present being done. The latter shows conclusively that coal abounds in that vicinity, while the former furnishes good indications that to strike it as good a site has been selected as could anywhere have been.

EL DORADO.

SICKENS.—*Mountain Democrat*, Oct, 22: D. W. Fox, near Johntown, has 10 acres of ground that have been mined down to the bedrock half a dozen times, then filled up with clickens, from which he cuts 2½ tons of timothy and clover per annum.

MINING AT VOLCANOVILLE.—R. O. Hart, a Grass Valley miner of extensive experience, representing a company of abundant means, went up to Volcanoville 2 weeks ago last Monday, took charge of the Josephine (formerly known as the "Dore") mine, started up the 10-stamp mill, and the indications are highly promising.

THE TEXAS HILL GRAVEL MINE.—At this mine, simultaneous with the erection of the 10-stamp cement mill, there are other active preparations for operations on a large scale. Mayer & Patten, at their blacksmith shop on Main street above Bedford Avenue, are building 12 cars for this mine, 10 of which are of ordinary size and 2 are to be extra large. A reliable and experienced miner, who recently visited the Texas Hill mine, tells us that he was unable to gather up a double handful of gravel anywhere in it that did not yield a fine prospect.

MINING AT HOOSIER BAR.—At Hoosier Bar J. W. Brown, of Greenwood, this county, and associates, have adopted a new invention for elevating gravel by hydraulic process to such a hight as will give sufficient fall to their sluices, and dumpage for their tailings. The elevator is an iron pipe 10 inches diameter, set at an acute angle, the top of which discharges into the head of the sluice boxes. One stream of water forces the gravel into the lower extremity of the pipe, whence it is driven upward with great force by another stream from a "Little Giant." By this means, for every 100 ft of pressure in the driving current a column of gravel and water can be driven upward 20 ft. The Hoosier Bar elevator is giving eminent satisfaction and has opened up some very rich ground. Last Friday afternoon, from one pan of bedrock gravel, Mr. Brown washed out over $25, and in cleaning up the bedrock after 1 day's run he and four hands panned out 10 ounces of gold.

KELSEY DISTRICT.—Georgetown *Gazette*, Oct. 21: The clean-up just made at the Gopher mill of one month's run from the Bowlder ledge, is highly satisfactory to the owners. The mill works to a charm, and the water power cannot be surpassed by any in the county. The mill is now running on ore from the Gopher ledge, crushing 20 tons per day, with very good results. About the mine everything looks well. They have run a tunnel 480 ft, tapping the incline shaft of 158 ft in depth, which gives great facilities for working the mine. In a crosscut in the tunnel the ledge is 15 ft from wall to wall, and in the incline it shows all the way from 4 to 10 ft ledge of fine milling ore. Mr. Aldersly, the Superintendent, is getting the mine opened miner-like, and soon will have things in shape so that 10 more stamps will have to be added. All outside works are getting in a number one shape so there will be no delays when winter sets in. Mr. Frank, one of the owners, is up on a visit, and his company is satisfied of having a good mine. The Judge mine, or old Dagget ledge, is being prospected again. The Superintendent, Mr. Ramail, has gone to San Francisco to make arrangements for erecting a 10-stamp mill on this mine. The Lone Jack mine owned by Mr. Jensen, will make a good showing this coming winter. Mr. J. is driving a powder drift to shake the country up about him. Kelsey township is showing up a number of good mines.

INYO.

WAUCOBA.—*Inyo Independent*, Oct. 22: J. Wal. Phillips and A. McKellips, representing a recently organized New York Co., are over in old Waucoba district, intent on developing some very promising mines in that region. They will put in some two months' work or more, and we hope for some good reports.

NEW DISCOVERY.—Samples of ore were brought in on Monday last from a newly discovered ledge in the Inyos, a little north of the Beveridge district. Two assays made by Mr. Woodhull showed respectively: gold, $80.33, silver, $31.42, total, $111.75; and gold, $12.50, silver, $81.08, total, $94.18.

GOLD MOUNTAIN.—A late letter from the Gold Mountain brings information that Supt. Ferris is pushing work on the new line water pipes to the extent of putting on every man that can be worked. Work in the mine has been suspended until the completion of the new hoisting works, which will require but a short time, when the shaft will be sunk 300 ft deeper as rapidly as possible. George D. Roberts, the original promoter of the State Lines, is now in San Francisco, enroute to the mine.

THE HIRSCH MINE.—A gentlemen who has visited this mine during the past week informs us that the late work done on the property shows a strong and well defined vein of ore 3 ft in width. This is practically a gold mine, although a wonderful variety of rich ores were found near the surface. At first, several tons of beautiful red oxide of copper was taken out, with grains and small masses of native copper running through the ore, carrying considerable gold. Then came a vein of rich silver lead ore about 6 inches thick on the hanging wall. Assays of this ore show 100 ounces of silver, and $20 in gold per ton. Finally the copper gave out and gold-bearing, copper-stained quartz now fills the vein. The gold can be seen in a large portion of the ore, and assays run from $30 to $150 per ton. This is one of the most accessibly located mines in Owens River valley. It is situated about 1,000 ft above the valley proper, and about 2½ miles from Owens river. The distance from Independence is about 9 miles, with a good road to the mine. The Hirsch is no doubt a valuable property, and in view of the rich developments in Beveridge, which is but a short distance from the Hirsch, this mine should not long remain idle.

MONO.

NIGGET.—Bodie *Free Press*, Oct. 21: Supervisor William Whetherill came into Bodie Thursday from his Dogtown placer diggings, having with him a nugget which he took out last week of about $50 value. It is the largest nugget which was ever taken out this side of the Sierra. Mr. Whetherill has several hundred acres of placer ground, and an ample supply of water, and is confident of realizing from it another fortune, equal to that which he realized from the Indian Queen.

THE BODIE TUNNEL MILL.—This mill is fast approaching completion. The roof is being shingled and the foundation for the engine is nearly finished. By the end of the present week the engine will no doubt be set up. The framework for the rock breakers, pulverizers and pans is also completed. It is expected that the machinery will be in operation by the middle of next month. Material for running the mill during the winter will be all on hand before cold weather sets in. It is anticipated that the Bodie Tunnel mill will have a very successful run. When finished it will be a very complete affair.

BODIE.—*Free Press*, Oct. 22: A large number of the Bodie mines have made preparations for working during the coming winter. A great deal of wood and other supplies have been, or are being laid in, and the outlook is more encouraging than it was two or three months ago. It is encouraging in this way: so long as a mining company has men at work underground, the prospects are good that an ore body may be found. The history of mining during the past 15 years is full of lessons. A mine may not be worth $500 to-day, and a single blast may send the stock up 1,000%. Just so long as a mine in Bodie district has men employed beneath the surface the prospects are encouraging. A great deal of attention is being attracted to the Lent shaft. The ore vein on the 705 level is rich and full of promise. A number of the other properties are looking well, and especially is this the case with the Bodie tunnel, Oro and Addenda. There is no change in the Syndicate, the mill being constantly employed on ore from that mine. The Champion is also prospecting well, while the Tioga has been doing some good work on the lower levels. Those who are interested in Bodie stock have no reason to feel discouraged at the prospects, for, as stated in the outset, surprising developments are often made in a day, and at a point often where least expected.

NEVADA.

MT. AUBURN SUIT DOWN.—Nevada *Transcript*, Oct. 20: Orders have been received from San Francisco to close down the Mt. Auburn quartz mine. No reason is given, and we understand the mine is looking finely at the present time. There were only 8 men employed on the works, and they will find work without delay as there is a very great demand for laborers.

IMPROVEMENTS AT THE IDAHO.—Grass Valley *Union*, Oct. 20: The Idaho Mining Co. are at present engaged in making more extensive and valuable improvements in their pumping machinery. A new 20-inch engine and a large pump for the purpose of handling the water in the mine are being put in place. Work on the stone foundation is being prosecuted with vigor, and when the pump is set to work there will be no danger of the water ever getting the better of the miners. This new pump will be for the purpose of raising the water from the bottom of the mine to the 800 level of the old shaft, from which it will be raised by the present big pump. When everything is completed it will do away with a great many extra pump rods and bobs now in use, and the water can be handled with much more ease. The foundation for the engine will be of solid masonry of the most substantial kind. From present appearances, and the improvements the company are constantly making, it would seem that the Idaho would continue to be worked at great profit for years to come.

NEW YORK HILL MINE.—*Tidings*, Oct. 22: There are many rumors about affairs of the New York Hill mine, and street talk has it that a considerable lot of crookedness has been discovered there. We believe, or rather we suppose, that the mine authorities are investigating the matter. When anything like proven facts appear we will give them.

THE AMERICAN MINE SOLD.—North San Juan *Times*, Oct 22: On Saturday last the American mine was sold under the hammer by the Sheriff. The Yuba Tunnel Co., a corporation, were the purchasers. It was sold in 4 different lots. The mine ground brought $80,000; the joint stock ground was bid in at $10,000; the Union ground at $1,500, and the old American ground proper was bid in at $21,000, making a total of $72,500.

SHASTA.

IRON MOUNTAIN.—Shasta *Courier*, Oct. 22: Yesterday morning I saddled my steed and set fourth with the avowed purpose of paying a visit to the Lost Confidence mine, to view for myself those marvelous deposits of silver-bearing ore, of which I have heard such report. found the Superintendent, Mr. Sallie, who is an owner in the mine, engaged in packing, preparatory to shipment, a large quantity of fine looking ore. The lower tunnel is in 320 ft, and is about 100 ft below the surface, and 90 ft above this another tunnel has been run a distance of 120 ft, most of the way through good paying ore. From the termination of this tunnel a shaft is being sunk on the ledge to strike the lower tunnel. I understand the owners of this mine contemplate the erection of a 30-stamp mill at no distant day, there being ore enough in sight to justify them in the undertaking. Messrs. Camden & Magee, the principal owners of this valuable property, deserve great credit for the energy and enterprise they have displayed in prospecting and developing this mine, while there are other mines in this locality that will be more or less benefited by the developments made in the Lost Confidence. The owners of the neighboring mines have manifested a disposition to lay low and let the owners of the Lost Confidence do the prospecting which adds value to all the mines in the vicinity. Notwithstanding this, the owners of this rich mine have persevered until after a year of patient toil and the expenditure of thousands of dollars they now have every reason to believe that they will receive abundant returns for their labor.

NEVADA.

WASHOE DISTRICT.

CALIFORNIA.—*Enterprise*, Oct. 23: We are still engaged in opening up and cleaning out the drifts and winzes connecting with the Old Con. & Virginia shaft. During the past week 81 tons of ore have been extracted and sent to the mills; assay value, $24.

SIERRA NEVADA.—On the 2700 level the joint Union Con. winze has been sunk and timbered 8 ft. The joint Union Con. east drift has been extended 24 ft, and the west drift from the joint winze, 20 ft.

UNION SHAFT.—Are cutting out a bob pit at the 2000 station, and are retimbering the 1600 drift to the Sutro tunnel.

CON. VIRGINIA.—We are still engaged in opening out the drifts connecting with the old Con Virginia shaft, cleaning out winzes, etc.

OPHIR.—On the 1600 level are cutting out a drain and cleaning out sump in winze. Drill hole No. 1 has been extended 200 ft.

UNION CON.—On the 2700 level the joint Sierra Nevada east winze has been sunk and timbered 8 ft, and the joint Sierra Nevada east drift has been extended 24 ft and the west drift about 20 ft.

YELLOW JACKET.—On the 3000 level the north lateral drift was run 36 ft from the connection with the north winze, and the east cross-drift run 32 ft from the same point. The ground in both drifts is quite hard and free of water. At the switch east of the shaft, same level, we have extended the south lateral drift 33 ft from the same, and an east cross-drift 25 ft. The ground in both is hard and dry.

SUTRO TUNNEL.—The Prospect Drift at Point 4,035, South Lateral, has been extended 7 ft, making the distance from the south lateral 113 ft. At a point 108 ft from the lateral tunnel a crosscut was run east in the vein and has now reached a point 20 ft, measuring from the center of the drift. The crosscut passed through first, a clay seam, then a vein of quartz about 18 inches in width, then followed soft porphyry and quartz mixed; next was encountered a strata of very fair looking quartz, and finally vein porphyry, which we are now running through. As the porphyry is much softer and the quartz gives better assays than was obtained from the other crosscut, and the vein wider, the indications are more favorable northward. The flow of the water from the mouth of the tunnel is equal to 4,977,682 gallons per 24 hours.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, Oct. 22: During the week the shaft levels have presented few changes to note. The intermediate, between the first and second levels, has shown some improvement and is turning out considerable ore daily. There is also a slight change for the better in the intermediate, between the second and third levels. The eleventh and twelfth levels are yielding about the same quantity and quality of ore as at time of last report. There is a large amount of work being done in the levels above, and the appearance of that part of the mine is very much the same as last week. The daily yield of ore has been about 80 tons. Mill No. 2 started up on Thursday, the repairs not taking quite as long as was expected. Mill No. 1 has been running on half time for a few days. Bullion shipments for the week ending Oct. 19th, $17,005.53. Shipments on October account to Oct. 19th, $47,038.58.

MOUNT DIABLO.—The north crosscut from the east drift from the bottom of winze No. 1, third level, shows a small streak of ore averaging $50. The north crosscut, 40 ft above this winze, shows a fine ledge of ore 4 ft wide, assaying $80. An advance of 7 ft has been made on this ore and the prospect is promising. The north crosscut from the bottom of winze No. 4 shows no change; total length 46 ft. The east drift, 3d level, shows considerable improvement, and has a bunch of good ore in the hanging wall, of which the extent is not known as yet. Fourteen ft advance has been made in the drift. There is but little change on the 2d level. A winze has been started from the east drift to connect ore body followed in the 3d level. The winze in the gulch is down 134 ft.

ESMERALDA DISTRICT.

THE CORTEZ.—Esmeralda *Herald*, Oct. 20: The building of a carpenter shop and coal house has been commenced, and preparations generally are going on about the mine to enable the company to prosecute work during the winter. Sinking in the incline is being pushed in order to reach the level at which the lower tunnel will tap the ledge at the same time that the tunnel strikes that point. The mine is looking splendid at every point where work is going on.

POWELL'S MINE.—A. Powell, owner of a mine near Parker's soda marsh, about 9 miles east of Aurora, called to see us last Thursday. He said 3 tons of ore taken out had been sent to Dayton for reduction, but as yet he had had no returns. Assays go high up in the hundreds. The incline shaft is now down about 75 ft, and has been in ledge matter from the top to the bottom. Mr. Powell thinks he has a rich mine.

EUREKA DISTRICT.

STRIKE IN THE PROSPECT MOUNTAIN TUNNEL.—Eureka *Sentinel*, Oct. 23: News was brought in yesterday that an important strike had just been made in the Prospect Mountain tunnel. Some of the ore taken out was on exhibition at the Jackson House. The tunnel is on the west side of Prospect mountain, and is some 1,800 ft in length. The ore was struck in the face of the tunnel, and is said to be 500 ft deeper than the ore recently discovered in the Eureka tunnel. We were unable to learn the character of the ore. This is exceedingly good news for Eureka.

ANOTHER BONANZA IN THE RICHMOND.—Eureka *Sentinel*, Oct. 20: On Tuesday last the miners working in the west drift on the 6th level of the Richmond mine encountered a new and extensive body of ore. It is not yet known how large the body is, but it is thought to be extensive and very rich. Previous to the find there was ore enough in sight to keep the furnaces running for a year. The probabilities now are that there is an abundance of ore for a two years' run. After 11 years' extraction it would seem as though the Ruby Hill ore body was inexhaustible.

FLORENCE DISTRICT.

LOUISA.—Cor. Belmont *Courier*, Oct. 20: News from Florence district is encouraging. The Louisa Co. is pushing work on their claim, the Louisa mine, which opens out fine.

GRANTSVILLE DISTRICT.

THE ALEXANDER.—The chloride stope between levels No. 4 and 5 is looking well and from which we are now extracting about 45 tons of ore per day.

THE BROOKLYN.—In the Brooklyn, No. 3 level, drift was advanced 20 ft during the past week, making total length to date 208 ft, in face of which there is plenty of quartz showing little spots of sulphurets. The ore body on level No. 2 continues to look well and produces the usual amount of good ore.

ALEXANDER MILL.—The mill is running steadily and doing splendid work.

PROSPECT MOUNTAIN DISTRICT.

STRUCK IT RICH.—Eureka *Sentinel*, Oct. 22: John Heubner, who has been prospecting for several days in Prospect Mountain district, has returned, and reports that he has found croppings that assay $130 per ton. He says there is a great abundance of the stuff, and that it is free milling ore.

RELIEF DISTRICT.

ANTIMONY MINE.—*Silver State*, Oct. 18: Emmons & Young, of Lovelock, are making arrangements to work their antimony mine in Relief district. San Francisco men examined the mine, and were so well pleased with its appearance that they furnished $1,500 to prospect it, and if satisfied with it when that amount is expended, will purchase at a stipulated price. The ledge is very large on the surface, and the ore carries a high percentage of metal.

TYBO DISTRICT.

TAILINGS.—Cor. Belmont *Courier*, 20: Lieutenant-Governor Adams is testing a load of Oila mill tailings at the Tybo Con. mining company's mill. If satisfactory results are obtained he will build a Whits roaster at the Reveille mill, as he has several thousand tons of tailings there. Business in Tybo is very dull.

ARIZONA.

BISBEE NOTES.—Tombstone *Epitaph*, Oct. 21: From Messrs. C. Ollroy and William Wallace, who came in from the great copper camp, yesterday, we learn that mining matters are lively there. The Neptune Co. have made a strike on the Neptune, between numbers 1 and 2, that is looked upon as of decided importance. They are busy hauling their ore to the smelter at Hereford, accumulating a large quantity preparatory to the starting up of the furnace. The rock-breaker was met on its way to the works, somewhere between Charleston and Hereford. After this is set up the furnace will start up. The Copper Queen Co. are erecting a third smelter, which will give them a capacity of 600 tons of copper per month. It is well known that their output is only limited by the plant for reducing the ore. However, with the addition of the new furnace, their profits will be something nice. Take copper at its present price, 18 cents per pound; their copper brings $300 per ton, and their output $216,000 monthly, of which one-half is net profit. This will enable them to pay 4 % on the par value of their capital stock, with a surplus for the reserve fund of $8,000 per month. The developments on prospects throughout the district are of a very satisfactory nature. On the Golden Gate they are down 14 ft, with an ore vein 12 inches wide, and several smaller ones, all improving with every foot in depth. Black Jack is also improving, and gives promise of making a large mine. Work is about to be started up on the Broad Gauge and Silver Spray, both splendid prospects. The superintendent is expected every day to start up work on the Atlanta, which recently sold for $40,000.

BRITISH COLUMBIA.

CARABOU DISTRICT.—The miners in this district have done moderately well the past summer, and although a good many of them are now leaving for the lower country, many of the deep claims will continue to be worked throughout the winter. There has been quite a good deal of mining going on in a small way of late along the Frazier, but here, too, the season will soon close. In the Kootemai country several companies are at work, the principal party engaged there being the Black Hills Co., who are vigorously pushing operations on Cherry creek, notwithstanding the death of their late Supt. in charge, Joel S. Mead, the organizer of the enterprise. This is a strong company and it is confidently believed that they will achieve such a success the coming spring, if not before, as will give a great impetus to mining in that quarter.

COLORADO.

CASCADE DISTRICT.—Georgetown *Courier*, Oct. 20: The wagon road from Spring gulch to the mines on Ute creek, which the miners of that section have been at work on for some time, has been completed, and already shipments of ore have commenced. Last week the Silver Rag mine, owned by T. E. Schwartz and C. E. Bigelow, of Georgetown, and Martin Brimmer, of Boston, shipped to the Idaho Springs Sampling Works 2,400 lbs. of first-class ore that milled 161 ounces of silver to the ton, and 2,000 lbs. of second-class that milled 50 ounces. The lode is the eastern extension of the Muscovite, and is opened by two adits, the lower one 250 ft long, and the upper one, which is now being driven, 50 ft long. The lower adit shows from 0 inches to 2 ft of ore like that milled, and the upper one has not yet passed through the broken ground to the ore vein. The owners intend to work the mine steadily through the winter. A shipment has also been made, of several tons, since the road was completed, from the Great Eastern lode, which is the western extension of the Muscovite and owned by Dan Doyle, of Georgetown. On the Muscovite one contract only is being worked, as they are waiting the return of Mr. Worthington, who is now in England, and who is expected back next month, after which it is thought that the mine will be worked extensively.

RED ELEPHANT.—The Red Elephant Co. has recently given a lease for two years to Thomas Welch, Sheehan, Wood and others, on that part of the mine below the Clery adit on the White and the Sub level of the Bowlder Nest, which lies west of a point about 200 ft east of Swartz shaft on the White. The lessees are to timber the Swartz shaft in first-class shape and continue down to the Clery adit and then sink into the leased ground below the adit; also, to put up a suitable hoisting plant and a commodious shaft house at the surface. The lessees have commenced grading for the shaft house, which will be 40x50 ft in size with a wing for boiler.

IDAHO.

BELLEVUE SMELTER.—Wood River *Times*, Oct. 10: The Avon smelter, which has been Bellevue's boast and pride for months past, is about to be shut down, probably never to be "blown in" again. It is an old-fashioned affair, made of fire-brick and rock quarried on the ground, and the work was of the most primitive character. Altogether, the furnace was not in operation over three weeks and did not probably smelt a single charge successfully. It was impossible that it should. The primative nature of the establishment forbade that. Joe Douglas, the Comstock millionaire, who has supplied the funds with which to run the institution, arrived in Bellevue this other day. As soon as he saw the works he made up his mind that they would not, could not pay, and concluded to shut them down permanently. The plain truth of the matter is, that Mr. Martin, in his anxiety to so save his patron's cash, did not spend half as much money on his works as he should have done. About $5,000 expended for a Pacific water-jacket galena-silver smelter would have given him first class works and a furnace with which the samplers and smelters of this generation are familiar, and the result would have been satisfactory.

SMELTING ORE IN THE SAWTOOTH RANGE.—C. W. Cortright, manager of the Columbia and Beaver companies, passed through town on his way to Ogden. Mr. Cortright stopped long enough to state that a large deposit of smelting ore had been discovered in the Sawtooth range, and that it had already passed into the control of a strong company who would erect a smelter in the spring.

W. H. PETTIT, Supt. of the Monarch mine, of Atlanta, who came through to Hailey last Wednesday, says that the toll-road from the Sawtooth divide to Ketchum, a distance of about 35 miles, was lined with teams hauling machinery and supplies for the Columbia and Beaver companies, at Sawtooth.

HOISTING WORKS FOR THE ORNAMENT.—Machinery of a capacity sufficient to sink 500 ft has been purchased for the Ornament mine, up Croy's gulch, and the contracts for erecting the works are let. They must be completed by the 1st of December. This will be the second hoisting works in this section.

THE ROOKS GROUP.—W. A. Rooke, of Ketchum, is about to ship 30 tons of ore from the Rooks group of mines, on Warm Spring creek. Of this amount, 10 tons will be sent to Kelton, 10 tons to this city, and 10 tons to Salt Lake. The results obtained will determine to which place the ores of the mines superintended by Mr. Rooks will be shipped in future. Mr. Rooks is operating for a strong Boston company, who have paid in an ample working capital. They are in no hurry to get returns, and they propose to see where they can do the best. Four of the company's mines are now ready to ship an aggregate of 50 to 60 tons per day. These are the Ontario, Warm Spring, Sunday and Gopher. The Warm Spring mine has a 6-ft vein, half of which is galena. These mines will be worked all winter. Next spring they will yield large quantities of ore.

ENGLISH COMPANY.—*Idaho World*, Oct. 18: An English Co. bought a number of ledges on North Fork of Salmon last summer, paying $83,000. A 10-stamp mill was erected, but was found to be inadequate to crush the ore as fast as taken out, so the company recently put up a 20-stamp mill. The rock averages only $5 per ton, gold, yet the company claims that it can be profitably worked. Boise county has scores of ledges, the ores of which will mill not less than $5 per ton in the poorest spots, and they measure all the way from 2 to 10 ft in width. The ores are gold-bearing, free-milling, and easily taken out. Only a few of the mines are being worked, for the reason that the owners are without the means to put up mills, and when the rock is to be hauled many miles for reduction, only the ores of the richer seams will leave a margin for the owners after the expense of hauling and milling. With mills in close proximity to the mines, the poorest of the rock would more than pay the expenses of extracting and crushing.

MONTANA.

BUTTE BONANZAS.—*Inter-Mountain*, Oct. 20: On the middle vein in the 300 level of the Magna Charta 12 men are stoping on a body of ore between 2½ and 3 ft wide, and assaying over $200 per ton. The quartz shows a profusion of native silver. The strike of silver ore recently recorded in the Colusa was made in the face of the 160-foot cast drift, at a distance of about 400 ft from the shaft. The silver assay value of the ore is said to be about $70. The mine is now producing about 100 tons of ore per diem. There are no new developments to report in the Bell though the extension of this west 300-foot drift is being prosecuted with customary vigor. The ore in the face retains its usual characteristics, being as rich as ever in silver and copper. The ore now being hoisted is the richest ever taken from the mine. On the Morning Star, which, considering the amount of money expended in its development, has been, and perhaps will continue to be, one of the most profitable mines in the Butte district, operations are confined to the extension of the north crosscut from the bottom of the 200-foot shaft, from which the face is now about 12 ft distant.

STEVENS.—*Inter-Mountain*, Oct. 22: The developments of the past week have very materially improved the appearance of this property. The face of the east 200-foot drift has been forwarded 85 ft from the shaft, and within the past 20 ft as the ore shoot was approached, the character and richness of the ledge have undergone a marked and important change. The pay ore was previously mixed with clay and quartz matter, but now shows clean and solid, varying in width from 15 to 30 inches, and averaging about 2 ft across. According to samples carefully taken this morning, the ore in the face assays 80 ounces in silver and $20 in gold.

LEXINGTON.—At the bottom of the main shaft, and in the face of the 200-foot north crosscut, within the past few days, heavy bodies of water have been encountered, which so rapidly increased in volume that operations were temporarily suspended. A ledge has evidently been struck in both places, but as the rush of water allowed no time to investigate its extent or richness, it cannot be stated whether or not it was the main ledge.

ALICE.—The Alice mine is closed down for a few days to admit of repairs to one of the boilers. The mills will continue running, an abundance of ore being already extracted to keep the stamps in operation. The mine is reported in excellent shape.

ANDY JOHNSON.—Mr. Barnard was found in excellent spirits this morning over a strike made within the past few days in his very promising though yet undeveloped property. A crosscut north from the bottom of the shaft and a drift run west on the old ledge have developed a large body of very rich ore.

MAGNA CHARTA.—Mr. J. R. Walker, President of the company, this morning informed our reporter that sinking was to-day resumed from the 300-foot station, it being the intention to add another 100 ft to the depth of the shaft as soon as the work can be accomplished, and at the earliest practical date to continue the work until the Magna Charta shall have been explored to a depth equal to that of the Alice.

NOTES.—At the Clear Grit, upon which a fine shaft house has recently been erected, the incline shaft is being enlarged into 2 compartments, and sinking will soon be continued. Powerful hoisting machinery is already in position. At the Moulton a force of men is busily employed in making preparations for placing the new machinery in position.

UTAH.

COPPER.—Silver Reef *Miner*, Oct. 18: A gentleman just up from the Grand Ouich copper mines informs us that everything looks promising there for a large bullion output in the near future. The 2 stacks now running are turning out about 7 tons of base ingots per day—worth $200 per ton at the works. The only disadvantage encountered so far is the scarcity of water, which it is expected will soon be overcome, as pipes are being laid to bring water from a source about 9 miles distant. Five more stacks will be erected within the next 60 days, which will give a proportionate bullion yield. At present about 40 men are employed about the works. The indications are that Copper Mountain district will prove in all respects equal if not surpass Grand Gulch. Messrs Ellerbeck & Co. have been developing some claims there that show exceedingly well. The ore is far less rebellious than any yet found in that zone, and recent experiments have proved very gratifying to the owners. Arrangements are now being perfected to put up one or more smelters at once.

UPPER Calaveras county has a fine belt of comparatively untouched timber.

Gold.

Mr. Thomas Cornish, M. E., late of Australia, and the well-known author of "Gold Mining, its Results and its Requirements," has contributed the following excellent paper to the London *Mining Journal*. It reads:

Gold is the metal of all other products of the earth most eagerly sought after—beautiful in appearance, soft and ductile in its nature, it possesses charms and attractions to the ignorant savage, as also to the most highly cultured. No mind is either too high or too low to despise gold, either for its usefulness and beauty as ornaments, or for its intrinsic value as a purchasing power. It has in the past, and will in the future, be the precursor of much good and evil.

Our gold supply, that has such an immediate and direct effect on the finance, trade and commerce, is deserving of more attentive consideration than it has hitherto been accorded. It is not my intention in this work to enter into the history of the discovery and production of gold in past ages; but to treat, as briefly as possible, on the discoveries of the present age—its mode of production, and the means of increasing the supply.

The Golden Era.

The golden era of this age dates from the discoveries in California in 1848, and which were followed by the discoveries in Australia in 1851. Previous to these discoveries the estimated quantity of gold in circulation in the world was between £400,000,000 and £500,000,000; but during the past 30 years the gold miners of California, Australia, New Zealand, and other places, have produced from the earth and distributed throughout the civilized portions of the world about twice the quantity, or between £800,000,000 or £900,000,000. This vast wealth, or new purchasing power, has been put into circulation throughout the channels of trade and commerce by, comparatively speaking, very few men. I do not think there have been more than 250,000 men engaged in gold mining. The results of their operations have been absolutely wonderful, giving an immense impetus to trade, thereby improving the general prospects of mankind—developing new sources of industry, trade and commerce and increasing the world's wealth in proportion.

The production of gold being of such immediate and direct importance to finance, trade and commerce, it is desirable that the question of its supply should be carefully considered. The time is opportune for the discussion of the subject, and I will endeavor to give an outline of what I consider have been the results of gold mining on the world generally, the Australian colonies particularly, and the necessity of encouraging the industry, thereby increasing the supply of gold, as also some of the requirements necessary to place mining on a sounder basis, to produce more satisfactory results than are likely to be arrived at from the system under which it has mostly been carried on.

Gold mining may be termed a new or novel industry; that is, so far as relates to its being made a special feature of attraction and employment to a large number of enterprising men, who, since its discoveries (1849), have pushed forth into various parts of the world, and by their labor, aided only by the most primitive appliances, have created a wealth previously unknown, of such vast proportions that its production has been the means of revolutionizing the wealth, trade and commerce of the civilized portion of the globe.

Gold is real wealth, and the standard by which all other wealth is measured. Its production is the creating of a new purchasing power—not only so far as its intrinsic value is concerned, but it is a wealth that when produced is the germ or means of producing additional wealth. It is different in its results from that of other productions; as it is not consumed, worn out or destroyed, its influence and its motion may be termed perpetual.

The unexampled progress and the increased prosperity of the world during the past 30 years, must, I think, be chiefly attributed to the enormous supply of gold during that period. The sudden influx of this great new purchasing power, which has been twice the quantity of bullion the world previously possessed, gave to trade, commerce and finance such an impetus that could not have been derived from any other source or form of wealth.

The exact quantities of gold produced since 1848 would be difficult to arrive at, as much was taken away from the different countries without any record; but I shall not be overestimating the production, as follows:

California and other States of America	£600,000,000
Colony of Victoria	200,000,000
New South Wales, Queensland, New Zealand.	75,000,000
Other countries	25,000,000
Total	£900,000,000

In all probability the total amount of new gold distributed throughout the world by a few gold miners has not been much less than one thousand millions sterling. It is only by considering the effect of so enormous a quantity of bullion being added to the world's wealth in so short a space of time, that the mind can realize the special advantages that have been conferred upon civilized countries by the gold mining industry.

The Vital Importance of Gold.

Gold is the life blood of all finance, trade, commerce, manufactures, art, science, learning and every other kind of wealth for the comfort and essential necessaries of mankind. Its possession is the chief aim and consideration of all countries and civilized people. It is the standard stock of working capital of the world, from which all other sources of wealth are derived and radiate from. It is magical as well as real in its influence. The producer or possessor of any given quantity of gold can utilize it more readily, and to better advantage, than can the possessor of any kind of property of a relatively computed value of a similar amount.

To further illustrate my argument, the holder of a large quantity of goods of any description—say iron or corn—if the market be overstocked has to lower the price of the article, and the holder of gold can consequently buy more favorably and make his gold go further. Although there often is, and always will be, over-production of different classes of goods, there is no probability of there being an overproduction of gold. The more gold produced, the greater are the wants of those who produce it, thus causing an immediate and direct circulation of that wealth amongst the community in which it is produced or ultimately absorbed.

Gold and silver being the precious metals adopted as specie or as a medium of exchange and currency for regulating the value of other commodities for the use and benefit of mankind—they being, in fact, the axis on which revolves the finance, trade, commerce and general business, as well as the pleasures and necessities of every-day life—it is of the utmost importance to all that their production, as also the results and requirements of mining, should be made subjects for consideration and discussion more than hitherto has been done.

Before the gold mining era, the increase of gold for coinage was not in proportion to the requirements of finance, trade and commerce which have been so rapidly extending. Therefore, the gold discoveries seem to be a most fortunate, if not providential, circumstance to relieve the general depression then existing by opening up new countries for settlement, and avenues for capital and labor, for the benefit of a large portion of the civilized race.

It is, I am aware, a generally accepted belief by many that the production of gold is of no more value or importance to the State or the general good of the community than the production of any other article of commercial value such as food, drink, clothing, etc. I hold a different opinion, and believe that the production of any given quantity of gold is of more direct, immediate and permanent benefit than any other specific article of supposed equal value. The production of every ounce of gold is the means of putting four additional sovereigns into circulation, which are at once available for their possessors to utilize—although the cost of production of gold is oftentimes an absolute loss to the producer; that is, by fixing a given sum as the value of the labor spent in raising it. Yet the gold so raised is a gain and an advantage to the community, as it becomes an additional capital to the world's wealth, by affording additional means of extending its credit and securing its liabilities.

The Effects of Gold Mining.

The effects of gold mining or the production of new gold appear to be but little understood. It has become one of the most important industries of the world. It creates new wealth or purchasing power, and is the direct acting means of opening up new avenues of industry and trade, which, but for it would not be known or required. It has the same effect on the finance, trade and commerce of the world as steam has on locomotion. Trade and commerce being merely an exchange of commodities between the several sections of a community, as also between different countries, do not create new wealth, but merely concentrate existing wealth. I mean that finance, trade and commerce do not add to the stock of bullion capital; the wealth made by it is the enhancement of the value of properties and merchandise, and the extension of credit and paper currency on the business done. All the trade of London for a year will not add an ounce of new gold to the currency or actual capital of the world's wealth. Any party of miners producing any given quantity of new gold from the earth does more real good to the community than does the business transactions of any similar body of men engaged in any other occupations, because the gold so raised by the miners becomes an immediate addition to the working capital of the community by affording additional means of extending its credit and securing its liabilities. Thus any given quantity of gold raised is not only so much more money in immediate circulation, but it is also the basis from which radiates additional capital, in the shape of credit or paper currency, that is issued and recognized as money on the basis of gold. The continuous production of gold has become a necessity to the requirements of monetary institutions, by whose aid trade and commerce have extended to such a wonderful extent. Although the production of gold during the past 30 years has been of such vast proportions, its influence has been extended by means of credit and confidence in its security, by almost arithmetical proportion. No figures or calculations can estimate the real advantages that have been gained by its dissemination throughout the channels of trade and commerce.

Its results have been to raise the value of commodities, labor, material, land, houses and other properties. It has given an immense impetus to all trades, manufactures, arts, sciences, and learning. It has elevated the general tone of society and information of all classes. It has stimulated social pleasures and pastimes and engendered a spirit of enterprise in commerce, finance and industrial pursuits, never before known. The elastic credit based on the enormous supply of new gold produced by the miners has been stretched to a great extent, and the calculations and speculative operations of most all our large monetary institutions are based upon a continuance of the supply—so that if it were to happen that the gold miners ceased their operations, and suddenly stopped the supply, the trade and commerce of the world would receive such a shock that they would for a time be paralyzed. Monetary institutions would feel a like effect, and many of them would be ruined. It would lead almost to general bankruptcy, and an immense entailment of national and private expenditure. Any sudden or partial check in the production of gold, must, as a natural consequence, have a corresponding effect on the general trade and prosperity of the countries in which it is produced or in which it is mostly absorbed.

Adding to the List.

Last week we published an article from the *Mining Press* giving an account of large nuggets and masses of gold found in California in the past. From trustworthy sources we are favored with additional accounts of finds in El Dorado county, ranging above $500:

In the summer of 1857 the Aiken brothers, mining on Manhattan creek, two miles from Georgetown, found a nugget of gold, free from quartz, that coined $1,166. In 1857 Samuel Treeworgee, mining at Garden valley, found a slug worth $525.

Thomas Patten, of Placerville, informs us that in the year 1849 or early in '50 a nugget was found in what is now known as Illinois canyon, near Georgetown, worth $1,000. The locality was for a long time known as the "$1,000 canyon." Our informant believes the piece was sold to John T. Little, then a merchant at Coloma, now a real estate and money broker in San Francisco.

Geo. Beattie, of Georgia Slide, saw a nugget in September, 1850, of solid gold about the size and shape of a goose egg, worth about $1,000, found by a man named Jenking in Hudson gulch, at Georgia Slide.

In July, 1860, John B. Bennet and Milo Knox, now of Georgetown, found a piece of pure gold weighing two and one-half pounds, worth over $500, in the well-known Pennsylvania Seam mine at Spanish Dry Diggings, in a tunnel 45 ft below the surface.

About 1854 a mass of gold valued at about $1,100 was taken from a gulch near the Grit Seam mine by "Texas" and Jacobs.—*Georgetown Gazette.*

The Old and the New Prospector.

Eastern dabblers in mines are beginning to understand pretty well, of late, what the term "grub stake" means. The arrangement made by many Eastern companies with these so-called miners is by contract, binding them to work continuously for a certain number of months. In lieu of pay, the miners are to have food, tools and transportation, and from one-eighth to one-half interest in such mineral veins as they may find. The outfit of food, tools and animals for these contract prospectors is expensive. The free prospector fits himself out cheaply. For food he buys bacon, flour and yeast powder. His pack animal is a small donkey. He has a rifle and fish hooks and lines; and on these he, to a great measure, depends for his food. The men sent out by prospecting companies are promised canned goods and prepared food, which they never before heard of. They are equipped for a picnic and the work they will do is similar to that done by other picnic excursions. They will play cards under pine trees, smoke pipes by the banks of mountain brooks. They will prospect in an aimless way. If any of them shall accidentally discover a lead of any value, they will probably, if unwatched, quickly cover it and depart for other fields. If a lead of the desired poverty in gold and silver shall be found by any of these men, they will become enthusiastic over the great find, and slowly sink a shaft, or with great deliberation drive a tunnel. The mining camps of the Rocky mountains are filled with men who will prospect on a grub stake only. They wish to have the expense of their summer's excursion borne by a company, or by some credulous person known as a "grub staker." A prospector who works under a contract seldom finds anything until the contract he has signed has expired. This, with a few exceptions, has been the rule.

On the Yellowstone.—A corps of Government engineers is at work near Eagle Butte, improving and changing the channel of the Yellowstone. About 30 men and a complete outfit of barges and engines are on the ground and have been at work for a couple of weeks. At three or four places where the channel is bad between Glendive and Miles City, this work of improvement has been pushed rapidly forward and will continue until it freezes. This will make steamboat navigation an easy matter next summer.

Making Their Own Rolling Stock.—The machine shops, foundry and engine works of the Northern Pacific Company at New Tacoma, employ about 100 men. They manufacture all manner of engines, car wheels, and every description of cars, and supply all the roads in Eastern Oregon, Washington Territory and Idaho with cars and engines. They now have contracts for 450 passenger and freight cars.

The Hot Springs of the Great Basin.

As is generally well known, the great Utah basin abounds with hot springs, which differ greatly as regards the chemical composition and the medicinal properties of their waters, as well as their physical characteristics. Some of these springs occur in groups occupying great mounds formed by the mineral depositions of their own waters. Others are found isolated, presenting much the form of deep wells, the water coming just to the surface and flowing off in rivulets large or small. A few are spouting geysers, throwing up the water several feet above the surface of the ground. Great sanitary virtues are by the Indians claimed for the whole of them; these people, when ailing, proving their faith in the water by a free use of it, both internal and external.

Some of the most remarkable of these springs exist at points far away from the abodes and haunts of the whites, and aside from the much-traveled thoroughfares, and even the trails of the prospector, and have therefore been but little seen and rarely described, hardly any of this class having ever been utilized or even "taken up."

With the settlement of the country, the more accessible of these fountains of health have, however, been claimed and devoted to hygienic uses, a few, where sligibly situated, having become places of considerable resort. Such has been the case with the Failes hot springs, located about 15 miles northwest of Bridgeport, Mono county, and which, though discovered more than 20 years ago, appear to have been neglected until quite recently. Being on the trail leading across the Sierra from Sonora to the old Monoville diggings and Esmeralda, they were a noted camping ground in the early days.

Concerning the features and present condition of these springs, the Bodie *Free Press* has this to say:

These springs are located at the base of a range of hills, and cover nearly half an acre of ground. The proprietor, Mr. Sam Failes, has a hotel close by them and bathhouses over them. The springs are of different grades of temperature and mineral character, a portion being strongly impregnated with iron, and others with soda. Most of the springs are boiling hot, while others are simply warm. There is a hot mud bath into which rheumatics are buried, with the most remarkably beneficial results. A steam bath is arranged in one of the hottest of the springs. The bather sits in a chair, his head protruding through a hole, with the vapor enveloping his body. This bath will make a marble statue sweat like a roustabout, and must be very beneficial in many kinds of disease. The best fun, however, is the swimming bath, which is about 30 ft. square and four ft. deep. The warm water boils up all over it, which imparts to it a somewhat satanic aspect, but it is a most delightful place to bathe. A couple of empty casks afford the bather an opportunity to exhibit his agility, but it is doubtful if anyone has yet been found who can ride them with grace—or, indeed, without grace, for more than a second or two. About 300 or 400 yards from the springs is a hill about 100 ft. high, covered with rock of evidently aqueous origin. Upon climbing this hill it is found that the rocks mentioned simply form a rim to a deep basin 200 or 300 ft. in diameter, and about 50 ft. deep. It is evident that at this place there has at one time been a hot spring of immense diameter, possibly a geyser, throwing its water 200 or 300 ft. into the air. The bottom of the basin is now overgrown with weeds and sagebrush, and on its rim are growing small nut pine trees. These hot springs have been visited by a number of Bodie people during the past summer, and as the hotel is well kept, it is probable that the number of visitors the next year will be greatly increased.

Copper Product.

The *Engineering and Mining Journal* estimating the "output" of copper for the present year, derived from two parties who follow developments very closely, figures up one of these 63,300,000 lbs., and of the other 56,300,000 lbs. In the first, however, Arizona is embraced as producing 5,000,000, and in the last is entirely omitted. Touching the above estimate for Arizona, the Phœnix *Herald* remarks that it falls far short of the real quantity produced, as it is well known that the Copper Queen alone will reach 7,500,000, and the Clifton mine not less than 2,500,000, leaving out of the account other copper-producing mines which have not undergone sufficient development to warrant including them until shown to be more pronounced producers.

The Carrie copper mining company's smelter at Globe, started up on the 27th of September, and, except for a few hours' delay on account of their pumps, has been running successfully since. They turn out an average of 1,000 lbs. of copper every two hours, more or less, according to the grade of ore they are handling. The furnace is run with three shifts of men, and the company intend to keep it running right along, which they will have no difficulty in doing, as there are ample reserves of good ore in sight at their mines.

There are only about 60 people left in Hamilton, White Pine, a town that contained 3,000 people in 1869.

The Engineer.

Improving the San Joaquin.—C. E. Rhodes, a civil eagiaeer attached to the United States Engiaeer Corps in this State, has completed a survey of what is kaown as the Devils Elbow, on San Joaqain river, and reported to Colaael Meadell. The ohject of the survey was to fornish the latter named officer with data to enahle him to ohtain the necessary appropriation to cut a navigahle chanael through the bend aext year. Two hends in tho river have already been cut off, and steamers ply daily through the aew channels. The first is at the Loae Tree head, aad the second at the hend above Wakefield. These cuts are each 100 ft. wide, and are dredged to a deptb of 10 ft. at the lowest low water during the seasoa. Mr. Rhodes has had 109 saags removed from the San Joaqoin river, between Grayson sad San Josquin City, and has huilt several wing dams to rectify the chanael, and has therehy increased the depth of water in placcs from oae to five ft. On Monday aext he commeacee aa oxamiaation of the Mokelumae river from Woodbridgo westward to ascertaia what improvements aro needed, to insure the uaiaterrupted navigation of that stream.

The Panama Canal Scheme.—The reports ia regard to the proepects and progress of the Paaama canal scheme, arc quite unsatiefactory aad somewhat conflicting. There seems to be ahundant preparation, but very little actual work. At one time we are told that the cost of excavation will greatly excsed tho estimates, aud tben again we read that recent soundinge show immense depceite of clay, where hard rock was eapposed to exist, thue greatly reduciag the original eetimates. And now we are told that "tue Brussels excavators employed, work expensively, except in soft mud, and that the excavation at one of the new villagee is fouad to cost actually $1.25 per cuhio yard, instead of three cents, ae origiaally estimated." At a recent date, 70 of the total numbcr of workmen had already died, and there wae a great demaad for hospital accommodations. This latter convenience wae heiag largely extended, incluaiag graveyard convenieaces. Altogether, it would seem that the prospects of this magnificent engineering scheme are anythiug hnt brilliant.

Stopage of Power.—The invention of the French electriciaa, Faure, for the storage of eleotricity, eeems to have opened up a new field for iaventors. Our own electriciaa, Brush, has alreedy presented to the world a device for storing electricity, which, it ie claimed, is much superior to that of Fanre. Varioue devices for the prodnction and etorage of electricity hy wind power, hy oceaa wave power, and hy tidal power, have been euggested, and are now eageging the attention of iaventors. But the latest aaaonacement ia thie direction ie the following, which we clip from an Eastern exchaage: Modern science hae achieved a great victory ia at lengtb devisiag a meane of utiliziag the labors of prisoaere on the treadmill. The mill caa he connected with a dynemo-electric machine, aad eet to "etoriag energy" with Faure's accamnlator. The boxes of energy can he sold for honsshold purpeses. Behold, the solution of the prison lahor question.

Underoround Telegraphs.—Germany has demonetrated that it is practicable to put telegraph wiree under grouad. She hae no less thaa 221 towns and cities thue conaected, and four years experieace has proved satiefactory. Our own experimente are also satisfactory, hut it is certain that the old eystem will not he ahandoaed voluntarily. The Germans have adopted eimple aad inexpensive methods, coal tar heiag used for insulating purposes, with no provision for repair exceptiag instruments to locate fault. American devicee already approved hy experts, contemplato a eyetem far more complete, and no time should be lost in applying them in the most practical manner.

The firet electric railway in Upper Silesia has been erected in connection with the colliery of the Doanersmarckhutte Co., to snpersede the ordiaary horse railway. The current is conveyed by wire ropes, eupported on poles in the seme maaaer ae telegraph wires. The maximum speed will he eight miles per hour. The locomotive is similar to that exhibited two years ago at the Indaetrial exhibition, hut is eomewhat smaller. The line aad ite accessoriee were coastructed hy Messre. Siemens and Haleke.

Ocean Wave Power.—The Swales Ocean Wave Power Compaay hae incorporated, to furnieh power hy means of the action of ocean wavee and tidee with which to eupply ealt water for watering etreete, fluehing eewere, eupplying puhlic and private hathe, extinguiehing firee, and other public and private purpoeee; for driving machinery, compreseing air, generatiag electricity, and for all manufacturiag and commercial purpoeee. Capital etock, $5,000,000.

The Proposed Tunnel Under the St. Lawrence.—Notice was recently made of a echeme for tunneling the St. Lawrence river at Montreal. It ie now reported that the echeme ie likely to he abandoned in favor of a hridge, the English memher of the Tunnel company having joined a railway company holding a charter for a bridge across the St. Lawrence near Lachine.

Useful Information.

Seasoning Timber.—With the increaeing ecarcity of timber, experimenters and inveators appear to he constantly at work devising ways and means for preserving it from decay when put to practical nse. The latest improvement in this direction is that introduced hy Mr. C. Rene, pianoforte maker, of Stettin, Germaay, who ntilizes the property of oxygea, particularly of that modified hy the electric curreat, to produce tho desired result. It is very well known that wood seasoaed for years is much more suitahlo for all parpoees than if used eoon after it ie thoroughly dried. Several artificial means of seasoniag have been iatroduced, hut no syetem at preseat appeare to he largely adopted; and if a cheep and eimple process were discovered, it would ao donht tend to improve woodwork geaerally, whicb is now too often finished in a defective menner, owing to the damp etate of the timher used. This is often noticeahle in the doore aad windowe of newly built houses. Mr. Reae introducee his process particularly for musical instrnments, though there seems no reaeon why it should not he used for maay other purposes also. Instruments thns treated are said to possess a remarkably fine toae, and are not likely to deteriorate, hnt improve with age, ae did the famous violine of the old Italian masters.

A New Wood-Preserving Process has heen invented in France hy M. Jecques. He first impregaates the timher thoroughly with a eimple solution of soap, mixed with aa acid—preferably phenic acid. This causes the fermentatioa, in a few days, within the wood, of a fatty acid, which is ineoluhle ia water, aad impregnates the remotest fihere. The reaction of the acid on the soap does not take place until a portion of the water has evaporated. It is claimed that more perfect impregaation can he had in this way than with creosote, and that there is no daager of the washing out of the preservative from the exposed sorfaces, as when sulphate of copper is used. The Government Commission on technical railroad operation in France is said to favor this process.

Under-water Lamps.—A new method of illumiaatiag the taaks at the Royal Aquarinm, Westminaeter, was lately ehown hy meaas of the "Faure" electric hattery, and whicb, so far as it went, was of a successful character. The lights shown were, to the number of eix, submerged in the tank with excellent effect, showing up every fish and plant with great dietinctnoss, a result impoesihle to attain under the old eyetem of gae illumiaation. One of the great advantagee of the electric over the gas lightiag system is, that the fish do not seem to mind in the least the close proximity of the incandoscsat lamps, while at the same time they do not euffer from the noxious emanatione evolved duriag the combustion of gae.

The cracks in common mortars and cements are due, accordiag to the investigations made hy M. Decourneau, to the uncombined quicklime which they contain. In order to neutralize the lime aad overcome the difficnlty, he employs a compound formed hy mixing very fiae silicious powder with the diluted nitric acid. By thie means, mortar is obtaiaed haviag a much greater as well as more uniform and lasting resistance than those hitherto in use. The application of this method, it is stated, has givea excelleat reeults, especially in the aew forts at Parie, and the stones mede hy such process may he sawed and chiseled like natnral stone.

Spiders Obstruct the Telegraph.—Oae of the chief hinderaacee to telegraphing in Japan is the grounding of the current hy epider lines. The trees hordering the highways ewarm with spidere, which epiu their wehs everywhere hetween the earth, wires, posts, insulators, and trees. When the spider wehe are covered with heavy dewe they become good conductors and run the meesagee to earth. The only way to remove the difficnlty is hy employing men to sweep the wiree with hruehes of hamhoo; hut ae the spidere are more numerous and persistent than the hrush neers, the difficulty remeins alwaye a serious one.

Soap Bubble Balloons.—M. Delon, of Parie, producee miniatnre halloons hy means of ordinary gas conducted through a caontchouc tube aad clay pipe to glycerine soap solution. A small disk of thin paper, with fine wire from its center to a little paper car with æronaut figures, is connected to the huhhle when it hegiae to swell, the disk heiag attached hy capillarity to the part where the drop forms. The detached hubhle riece with ite car.

To Prevent Frost on Windows.—A British Colamhia eubscriher inquired leet week how he could prevent ice forming on the ineide of hie windowe in cold weather. A druggist of thie city eaye if saucere or other ehallow veeeele, ocntaiaiag eulphuric acid, are placed in varione placee in the room, the acid will absorh nearly or quite all the moieture from the atmosphere, leaving none to condenee upon the windowe.

To protect lead pipe from the action of water, form on the ineide eurface an insoluhle eulphide of lead, hy filling the pipe with a warm and concentrated eolution of eulphide of potassium or eodium. In 15 minutee pour out the eolntion and allow the pipe to dry.

Hard Putty.—The *Carriage Monthly* gives the followiag for a hard putty that will dry in one day: Take the whiteaiag, mash all the lumps out on tho stone, and mix it into a stiff paste hy addiag eqaal parts of japan aad rnhhing varaish; then add as much ksg-lead aad yon thiak will mako it work free with the knife; then add the rest of the whiteniug until you have it to suit yoa. This will saud-paper good with one day's drying. If you waat putty that will dry quicker, take dry white lead aad mix with equal parte of japaa and varoish, to whicb add a few drope of turpeatine. Thie is very soft for potty, hut caa be saad-papored in from two to three hours, it hecoming perfectly hard in that time.—*The Leffell Mechanical News.*

Brakemen.—It is rare to read a newspaper through without seeing a notice of the death of a brakeman. It is eetimated that at leest ten brakemen are killed in this country every day; that three times ae meny are iajured. They are killed or maimed while coupliag or uncoupling cars in makiag up trains, or slip on the track and are run over, or are knocked from the tope of cars, or crushed hy collieions. An occupation in which 3,650 lives are lost and 14,600 pereons incur serious iajnries, in this country alone, may well he called a dangerone one. The casualties among hrakemen appear to he much greater than among the soldiere in onr regular ermy.

To Bore Holes in Porcelain.—It is sometimee aeceseary to bore oae or more holes in porcelaia, hut the ueual way of doiag this is not easy. If, however, an ordiaary drill he hardened and kept moist with oil of turpentine, it will easily penetrate the porcelain. The drill commonly employed in connection with scroll-cutting machines answers very well.

Chamois Skins.—Maay persons suppose that chamois ekias are derived from the animal named the chamoie. In fact, the skias so called are the flesh side of sheep skins, soaked ia lime water and aleo in a solution of sulphuric acid. Fieh oil ie poured over them, and they are then carefully washed in a eolution of potash.

Mineral Oil Lubricants.—It is asserted tbat mineral oils are aot to be recommeaded as lubricants, since they attack any India rubber with which they may happen to come in contact.

Finely powdered glaee, mixed with soluhle eilicate of eoda will ho found to meke an excellent acid-proof cement.

Good Health.

Peculiar Eyes.

White hair and pink eyes are the peculiarities of the two children of Mr. and Mre. Franklin Rix, of Franklin towaship, Polk county, Iowa. One is four years old and the other two. While they are compelled to weer goggles because they caanot hear the sunlight, they can see in the dark even hetter than in the day time, being ahle to pick up a pin on the darkest night.

A Hartford (Coan.), paper relatee a singuler circumstance connected with the eyes of a young lady 16 years old, residing in Litchfield. She was recently confined for a few days in a dark room on acconnt of her eyee, until one day, after a sudden aad peculiar seneation, they felt decidedly hetter and she was taken into the light. When ehe entered the dark room her eyes were etraight and natural; she was now cross-eyed; but the moet eiagular thing ie the asserted fact that when ehe closes the right eye ehe cau see to a dietance of eight or ten miles with the left eye, and distiaguish objects as though they were withia the ordiaary range of vieion. The distant hills appear to he brought cloeer ae if hy a teleecope. Oa the other hand, when she closes tho left aad uses the right eye for vision it appeare to he a microscope. The point of a needle looks like a hlunt piece of iron, aad so with everythiag near hy. But when hoth eyes are open they assume the cross-eyed expreseion and she eeee everything natural ae other persoae see. The report is that the girl is to he taken to New York for medical examination.

Surgery in the Middle Aoes.—Dr. Lyman, writing in the *Popular Science Monthly*, refere to the low condition of surgery when it was in the haads of the harhere, and when eurgeoas were called "ekinnere." He quotes a paeeage from Sprengel, eaying that in Germany no artiean would employ a youag man as an aprentice without a certificate that he was horn in marriage of hoaeet parents and came of a family in which were found ueither harhere, hathere nor ekinners.

Acid burns.—The *Bulletin de Therapeutique* eaye that acid hurns can he cured hy the application of a eoft paete of calcined magneeia and water, in a layer ahout two millimetere in thickneee. The magnesia requires to he renewed in 24 houre; hut patients, after recovery, retain no marke of the accident

Carbuncles.—It ie recommended to treat carhunclee and hoila with pure carholic acid, injeoted hypodermioally in sufficient quantitiee to thoroughly saturate the swelling.

Whiat is Pepsin?—The *Scientific American* aaswers tho qnestion as follows: "Pepsin ie a aitrogenous substance existing in the gastric juice, and as a viscid matter in tbo peptic glaad aad on the walls of the stomache of aaimals. The mucoae membrane of the stomach (of tho hog, sheep or calf, killed fastiag) is scraped, and macerated in cold water for 12 houre; the pepsin in the etrained liquid is theu precipitated by acetate of lead, the deposit washed once or twice hy decantatiou, sulphureted hydrogen paeeed through the mixture of tbo deposit with a little water to remove the whole of tho lead, aad the filtered liqoid evaporated to dryness at a temperature not exceediag 105° Fah. As met with in pharmacy the streagth of pepsio varies greatly. It is often prepared hy simply mixing witb etarch the thick liquid ohtaiaed on maceratiag the scraped stomach with water, and evaporating to dryness. The composition of pepsin is not positively known."

Sixty-five Days in a Bath Tub.—Dr. D. Prince in the St. Louis *Med. and Surg. Journal*, describee tho treatmeat of a case of rheumatism with necrosie of the femur, bed sores aud great emaciation. He was euspended in water hy meaas of straps eo as to be completely submerged except his head, and kept in this condition 65 days aad nights. He screamed witb pain if taken out, bnt was comfortable ia the water. Some improvemeat took place, particularly in tbe soree, which were partially healed, aad though bigh hopes of a cure were excited, he died at the end of 65 daye from oxheustioa. Two grains of quinine were given daily, and two quarts of ealt put in the water, which was renewed daily, hesidee whenever defacatioa or nriaation occurred, hut etraoge to say the temperature of the water is not mentioned.

Expectancy of Life.—Insarance companiee are aware of the iacredulous weakness of those whose lives they aeeure, and have therefore compiled nnmerous tablee of expectaacy of life for their own guidance, which are carefnlly referred to hefore a policy ie granted. These tahles have heen the result of careful calculation, aod seldom prove misleading. Of course, sudden aad prematuro deaths, ae well ae livee unusually extended, occasionally occur, hut the average expectancy of life of an ordinary man or woman is as follows: A person 1 year old mey expect to live 39 yeare longer; of 10 years, 51; of 20 years, 41; of 30 years, 34; of 40 years, 28; of 50 yeare, 21; of 60 years, 14; of 70 years, 9; of 80 years, 4.

The Japanese.—The Japaaese have much to learn concerning health and disease. If we may credit the statemcnt of the New York *Herald*, they do not helieve in such a thiag as contagion, and would he as willing to live in a houee with a friend who had even so virulent a disease as the small pox, as if he were eound and in perfect health. Thus, when cholera is declared hy the hoard of foroiga physicians to he an epidemic in Yokahama, and the Japaaese goverament, at their instigatioo, take measures to prevent the spread of the diecase, the aatives object to he placed ia quarantine, and use every method in their powor to escape from their houses.

Death Caused by News of Death.—The death of the Preeident caused the death of two pereons in the town of Flint, Michigaa. Oae, a carpenter, who had worked as usual during the day, and to all appearances was in good health. He heard the hell tolled and exclaimed: "Tho Preeident is dead," aad died almost instantly. The other, a young lady who bad heen sick for some time, said, when ehe heard the bells, "The Preeident is dead and I shall eoon he with him," and died before the hells ceased tolling.

Intellectual Work on the Circulation. What are the effects of different kinds of iatellectual work on the cerebral circulation? This question M. Gley, a French physiologist, has attempted to aaswer hy experiments made upon himself. When he applied himself to a snhject which he had a difficulty in underetandiag thoroughly, and had, therefore, to concentrate all hie energiee upon it, the rythm of the heart was far more accelerated than when he took up some matter with which he was well acquainted.

Calomel in the Human System.—Considerahle donht bas heea expressed whether calomel is or ie not liable to decomposition in the human system, with production of corrosive suhlimate. According to experimente described hy P. Hoglan (*Chem. News*) calomelis slowly changed hy the action of water at the temperature of the hody with formation of corrosive suhlimate; and this chaage is accelerated hy the preeence of citric acid, eodium chloride, or sugar.

Marriages Between Relatives.—A Berlin profeseor is authority for the etatement that amoag Roman Catholics who prohibit marriagee hetween pereone who are near hlood relatives, the proportion of deaf mutes is 1 in 1,000; amoag Protestants, who are leee strict, the proportion is 1 in 2,000; while amoag Jewe, who encourage iatermarriage hetween hlood relatives, the deaf mutes are as 1 in 400.

The Preecott *Miner* eaye: The numher of deeperate characters that now infeet the San Francieco and Bill Williams ooaatiee, Arizona, make it diesgreeable and even a little dangerous for hueinese men to pnrsue their vocations in that section of oonntry.

MINING AND SCIENTIFIC PRESS.

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Passing Events.

As will be seen by what is said in another column, the citizen's committee which has been examining the debris region, has returned, having finished its labors.

New and valuable silver mines have been discovered on the head of Clark's Fork, a tributary of the Yellowstone river, Montana Territory. The mines are located near the National park, and are on the Crow Indians' reservation. Silver was found in Clark's park as early as 1868, by three prospectors, but they were driven off by the Indians. The district is extensive, and the quantity of ore inexhaustible. The mines are located in a sterile region, difficult of access, at an elevation of 10,000 ft. above sea level, and surrounded by mountains.

There is great excitement in Tucson (A. T.), over the failure and assignment of Lord & Williams. This failure embraces Lord & Williams, a company which, in addition to C. H. Lord and W. W. Williams, includes C. E. Harlow. The assignee is H. B. Cullum, the cashier. No information can be elicited as to the liabilities or assets. It is estimated that the unsecured liabilities are not less than a quarter of a million, while the assets are merely nominal.

Strikes are reported in Eureka district, Nevada, which are said to be extremely valuable.

The Woodworth (sometimes called the Ophir) mill, Carson river, started up last Monday. It is running on tailings, of which they have on hand a deposit of 400,000 to 500,000 tons. An increase of water in the river, due more to diminished evaporation than anything else, has allowed of the starting up of the mill.

Removal.

The building, No. 202 Sansome street, in which our business offices have been situated for four and a half years, is to be reconstructed, and the removal of our business to other quarters was a necessity. We have chosen to go to the new building upon the northeast corner of Front and Market streets, where we have secured ample space for comfortable and well-lighted offices. The situation is near to the seat of the great wholesale trade in produce and manufacture; to the manufactories of implements and machines, and to the main avennes of travel and transportation. The move will, we trust, make our establishment more accessible than before to our friends and patrons, and by giving us more space for the transaction of our growing business, may enable us to work even more efficiently for the benefit of our patrons and the public interest.

The diagram of streets, which appears elsewhere in this issue, will show plainly our new location. We shall have better means of access and egress than we have heretofore enjoyed, as the stairway at 252 Market street and the elevator, No. 12 Front street, both communicate with our office. Our elevator is propelled by water power, and made specially safe. We shall be pleased to see all old friends and hosts of new ones, and to give them a full welcome.

Visitors are advised to ascend by the elevator, and then take their choice of ways in descending.

The Debris Committee.

As it is impossible for us in the limited space at command to give any extended account of the trip of the Debris Committee to the "slickens region," we will not attempt to do so. Suffice it to say, the gentlemen of the committee have visited the mining regions and the agricultural regions affected by the question, and have examined the subject as well as it was possible to do under the circumstances. Of course no thorough investigation could be made, nor are the gentlemen composing the committee conversant enough with engineering problems to offer any very learned disquisition on the subject.

They have, however, seen the dams, the farms, the mines, the debris, the rivers, the towns and the people, and they have been the recipients of the conflicting opinions of several hundred interested parties. Now that they have returned fresh from the scene of the conflict, they can and will make up a report which will at least call more careful attention to the momentous question. As the Grass Valley *Tidings* very aptly says: "The committee will look at the situation, as it is involved in the slickens question, and will give an opinion concerning it—an opinion of business men who are engaged in commercial pursuits. The opinion will not be a decision, and will not be accepted as solving the question by either party to the controversy. The opinion will not stop the litigation of the cases pending, nor will it do away with the bitterness of feeling that now exists between the opposing interests. The attention of Congress and of the nation may by that opinion be called to the matter, and the result be a system inaugurated which will protect all rights and interests, and be satisfactory to most of the miners and farmers. That is about all that can be hoped from the discoveries the Chamber of Commerce Committee will make."

There is one very apparent thing, however, in this investigation: The committee found that the mining interests up in the region visited are very much larger than they had any idea of. And they found that the money invested in these mines, and the yield from them is larger than they ever supposed. The papers which have been be-littling the mining industry by misrepresentation will not possess the influence on this question that they have heretofore enjoyed.

Another thing, too, it is seen when the representatives of the opposing interests meet together without intriguing lawyers, they both manifest a disposition to come to an amicable agreement, which must be very unpleasant to the said lawyers. It is evident if no other good has been accomplished by this committee, that this at least has been done—bringing the representatives together in friendly discussion.

The report of the committee will no doubt set before the public, in a clear, popular manner, all the facts in the case, and we await its appearance with interest.

A GLANCE at *Disturnell's Gazetteer*, of Arizona, reveals the fact that the Territory has 55 stamp mills, of from 2 to 80 stamps each, aggregating 585 stamps. Of the entire number only one mill is run by water power. Cochise county, has 9 mills, aggregating 145 stamps. Gila county, 12 mills, 79 stamps; Maricopa county, 3 mills, 95 stamps; Mohave county, 7 mills, 90 stamps; Pima county, 5 mills, 52 stamps; Pinal county, 4 mills, 37 stamps; Yavapai county, 15 mills, 117 stamps. The Vulture mill, Maricopa county, heads the list, with 80 stamps.

Doctors Who Need Doctoring.

In a late number of the PRESS there appeared an extract from a letter of one, Dr. Granville, published not long since in an Eastern paper, and in which letter the utility of the efforts now being made to improve the sanitary conditions of mankind are seriously questioned. Our object in making room for this extract being to subsequently condemn the pernicious views set forth therein.

That these views are exceedingly objectionable, may be inferred from the fact that this so-called "doctor" expresses the opinion that people lived happier and better lives before so much attention was being paid to these questions of health, than at present. In other words, this person holds to the doctrine of the sybarite, that a short life and a merry one is the most noble and desirable. He affects to doubt whether all this bother about preserving health and prolonging human life pays in the end, as if temperance, cleanliness and strict attention to other hygienic requirements taxed our time, and means any more than the neglect of these laws, giving loose rein to our appetites and freely indulging in luxury and pleasure—as if it were not as easy to live right as to live wrong.

As the chief aim of these health preservative and restorative efforts consists in securing better ventilation and sewerage, the use of more wholesome food and purer water, the taking of more physical exercise by those who need it, exposure to sunlight, proper methods of clothing, personal cleanliness, abstinence from liquor, tobacco, opium and other expensive excitants and narcotics, it is hard to see how these aims, if fully carried out, are going to greatly increase the burdens of society or add to the sum total of human unhappiness. If, as this medico asserts, mankind were better and happier in times past, when they less concerned themselves about sanitary matters, it was because they then made little use of these pernicious articles that are now working so much harm, and towards effecting the disuse of which these reformatory measures are mainly directed. These disciples of the sensual school forget that the benefits that come of an advanced civilization are nearly counteracted by the evils that accompany them. To profit by the new, we must retain something of the simplicity that attended the old. If the log cabin was rude and uncomfortable, it was self-ventilating. If food in more primitive times was simple and coarse, it was little adulterated. If liquor was drunk, it was distilled from corn and rye and not compounded from deadly drugs, as at present. It is only two or three centuries since tea and tobacco were introduced into Europe, and hardly more than half a century since coffee came into general use. And now that we are threatened with a new evil, the use of opium in its various forms, it would be in accordance with the logic of these *laissez faire* philosophers to let the habit grow, and, abstaining from all repressive measures, allow the accursed drug to have full sweep.

The victim of this degrading habit delights in the sensation produced. Why interfere with his enjoyments or seek to check the practice by repressive measures and sumptuary laws? Why, in fact, trouble ourselves about the welfare of any human being, or even our own? "Soul, take thine ease; eat, drink and be merry, for to-morrow thou shalt die," is the language of the modern, as it was of the ancient fool. What signifies that crimes and intemperance increase; that self-murders multiply and lunacy grows apace? What cares this sort of doctor about the declension of virtue or the deterioration of the human race? What has he to do with the strong, well-preserved and healthy? It is only the weak, infirm and flabby that can be of any use to him.

And he has many followers, this man who so encourages the spread of disease that he may have a chance to cure it. All the vast army of sensualists, the slaves of appetite everywhere, preach this same doctrine of unrestrained indulgence in practices that they well know impair both their mental and physical vigor and lead to premature death. But it avails little to talk to them; the chains with which appetite binds its captive are generally too strong to be broken by appeals to interest, duty or reason.

We do not charge that this man sins against light. He evidently belongs to the blind leaders of the blind—that class of physicians who have never been hygienically enlightened. That all such men, however they may be dubbed "M. Ds." tend to bring the healing art into disrepute and scandalize the noble profession to which they belong, admits of no question.

THE practice of duplicating the names of mining companies or adopting the titles of existing companies is to be deprecated, and we can see no good reason why a company should so far loose sight of honorable dealing as to persist in the practice. A similarity of names leads to confusion, and so far as mining is concerned, has a tendency to destroy confidence. All such efforts are unworthy of credit, and the company adopting this plan of enticing the public should receive the wholesale denunciation it justly merits.

LAST week the police at Frankfort-on-the-Main seized and confiscated all the posters and bills in restaurants, which gave information to those intending to emigrate to America.

Copper Leaching.

Some time ago, in one of a series of articles on this subject, an outline was given of the Hunt & Douglass process of treating copper ores, by which silver, if present, is also extracted. The process was considered to be the best copper-leaching process then known. One of its advantages is that two-thirds of the copper is extracted in the form of dichloride, from which a given weight of iron precipitates twice as much copper as from a solution of protochloride or sulphate; the other third of the copper is protochloride. Thus, the consumption of iron is reduced to two-thirds of the quantity required by other processes; that is theoretically, but in practice to a still smaller proportion, owing to the absence of persalts of iron, which are usually formed in the other processes. Moreover, by passing the solution over sulphids of copper, the protochloride of copper in the solution is converted into dichloride by taking up another atom of copper, and by this means the consumption of iron is reduced, practically, to one-third of that of the older methods. Silver, if present, is dissolved as chloride, and may be recovered by precipitation on metallic copper, at the ultimate expense of the further portion of iron required for the precipitation of the copper thus dissolved.

Notwithstanding its merits, this process has certain defects. In the first place the reaction by which the copper is dissolved through the agency of protochloride of iron, causes the formation of hydrated peroxide of iron, a substance which greatly obstructs filtration, and from which, when filtration is replaced by decantation, it is still difficult to wash the solution of copper. In the second place, if silver is present, it cannot be precipitated from the solution by metallic copper, until the whole of the dissolved copper is reduced to the state of dichloride, and although the ultimate consumption of iron is not increased from this cause, since that consumption is determined by the quantity of chlorine to be saturated, and not by the quantity of copper to be thrown down, yet the necessity involves a certain inconvenience from loss of time; and if the ore is rich in copper, a larger quantity of brine may be required, because the dichloride of copper is much less soluble than the protochloride. It is true that the reduction to dichloride may be effected by means of sulphide of copper as stated, and then the saving of iron may compensate the loss of time, and necessity for more brine and extra vats; but this method is not always convenient.

The method of Claudet, of separating silver from copper in a mixed solution of the chlorides of those metals, by means of a soluble iodide, which throws down iodide of silver, is not applicable in the presence of dichloride of copper, hence, cannot be used in connection with the Hunt & Douglass process. A partial separation is effected by adding to the mixed solution a certain quantity of a soluble sulphide; the whole of the silver is precipitated as sulphide, together with a portion of copper, also as sulphide. The writer has found that the metals can be almost perfectly separated by operating on a boiling solution with a soluble sulphide, until nearly the whole of the copper is thrown down; the silver remains dissolved, and may be separately precipitated either as sulphide, together with the remaining copper, or otherwise.

This result depends on the fact that sulphids of silver is converted into chloride by a hot solution of either of the copper chlorides in brine. On the same principle the copper may be removed by precipitation as oxide instead of sulphide, and with the advantage that the oxide is the more tractable in the after treatment; but in either case the consumption of material would be considerable.

In view of these difficulties, the versatile inventor of the process, Prof. T. Sterry Hunt, of Canada, has recently devised another which, for neatness and apparent efficiency, can hardly be surpassed. This process depends upon the following facts:

First, if sulphurous acid gas is injected to a solution of chloride of copper, the metal is nearly all precipitated as dichloride, while sulphuric and hydrochloric acids are formed.

$$2\,Cu\,Cl + SO_2 + HO = Cu_2\,Cl + HCl + SO_3\,.$$

Second, if sulphurous acid gas is injected to mixed solution of sulphate and chloride of copper, in equivalent proportions, the metal is nearly all precipitated as dichloride, and sulphuric acid is formed.

$$Cu\,Cl + Cu\,SO_4 + SO_2 = Cu_2\,Cl + 2\,SO_3\,.$$

Third, if dichloride of copper is exposed to air, it takes up oxygen, forming oxychloride,

$$Cu_2\,Cl - O = Cu\,Cl + Cu\,O,$$

and sulphurous acid gas converts this again into dichloride, while being itself converted into sulphuric acid.

$$Cu\,Cl\,CuO + SO_2 = Cu_2\,Cl + SO_3\,.$$

These latter reactions take place simultaneously if air and sulphuric acid gas are passed together into water in which dichloride of copper is suspended.

In all these reactions the SO_3 combines with a portion of the water, forming HSO_4, or liquid sulphuric acid. Chloride of silver is insoluble in the acid liquid and in solution of sulphate of copper.

In practice, a solution of sulphate of copper is obtained to begin with, by means that will readily suggest themselves to the metallurgist, such as leaching some roasted sulphurous ore, or treating some oxidized ore with dilute

sulphuric acid. To this is added a quantity of a soluble chloride, such as common salt, equal to a little more than half the equivalent of the sulphate of copper in the solution, producing a mixture of sulphate of soda, chloride of copper and sulphate of copper in nearly equivalent proportions.

$2\,Cu\,SO_4 + Na\,Cl = Cu\,Cl + Cu\,SO_4 + Na\,SO_4$.

Sulphurous acid gas is then injected, and reaction No. 2, as above, takes place, nearly all the copper being thrown down as dichloride. Any excess of sulphurous acid in the liquid is now oxidized by the addition of a portion of the original solution reserved for this purpose, the dichloride is allowed to settle, and the acid liquid, which retains a little copper in solution, is used to dissolve the copper out of artificially or naturally oxidized copper ore.

If silver is present, the small quantity of chloride of copper in the liquid suffices to convert it into chloride, but not to dissolve it. It, therefore, remains in the insoluble residue, together with gold in the metallic state, and lead, if present, as sulphate, all or either of which metals may be afterward extracted by various well-known means, as smelting, leaching or amalgamating. The liquid is drawn off and treated with a soluble chloride, and with sulphurous acid, as before, and so on continuously.

The oxides of zinc, nickel and cobalt, if present in the ore, are dissolved together with the copper, but are not precipitated by sulphurous acid. They therefore accumulate in the liquid, and may be recovered from time to time by appropriate treatment.

If no silver exists in the ore, it is immaterial whether the half, or the whole of the sulphate of copper in the liquid is chlorodized by adding salt, etc., the only difference being that in the latter case, hydrochloric as well as sulphuric acid is produced, as in reaction No. 1; consequently chloride of copper is formed, as well as sulphate when the liquid is applied to another lot of ore. Chloride of copper dissolves chloride of silver, and is therefore objectionable when silver is present, because a portion of the latter would be carried down with the dichloride of copper in the subsequent precipitation by sulphurous acid. But in no case should a large excess of salt be used, as it increases the solubility of the dichloride of copper.

The precipitated dichloride of copper is collected and washed. It may then be reduced to pure copper by placing pieces of iron in it, while keeping it covered with water to prevent access of air, and to dissolve the chloride of iron formed; $Cu_2\,Cl_2 + Fe = 2\,Cu + Fe\,Cl_2$. The solution of chloride of iron may be used in place of salt, to add to the next solution of sulphate of copper. If iron cannot be had conveniently, the dichloride may be converted into suboxide of copper by boiling it in water with lime.

$Cu_2\,Cl_2 + Ca\,O = Cu_2\,O + Ca\,Cl_2$.

The suboxide is easily smelted to fine copper, and the chloride of calcium may be used in place of salt to add to the solutions, but in this case insoluble sulphate of lime will be formed, and must be allowed to settle and the liquid removed to another vat, before precipitating the copper by sulphurous acid.

If sulphureted ores or mattes are treated, they must first be oxidized by roasting, and the sulphurous acid evolved may be utilized for the precipitation. In this case a certain quantity of sulphate of copper is formed in the roasting of the ore, and in consequence, the quantity of acid in the liquid increases with each operation, so that after a time, it may be necessary or convenient to throw away a part of the liquid. Before doing so, any copper which may remain in solution, after the treatment with sulphurous acid, is precipitated by metallic iron.

When naturally oxidized ores are treated, the sulphurous acid must be obtained in some other way, as it cannot be produced from the ore itself. In this class of ores it may happen that lime, magnesia, or metal oxides other than copper may be present, which consume the acid of the liquid, and then it is necessary to increase the quantity of acid, which is done according to reaction No. 3, by injecting air together with the sulphurous acid into the solution.

The advantages of this process over the original Hunt & Douglass process are, firstly: silver if present, is not dissolved together with copper; secondly, there is no formation of peroxide of iron to obstruct filtration, etc.; thirdly, the copper is obtained in great purity, and with the least possible consumption of iron or of lime; less than 50 lbs. of iron being required for the production of 100 lbs. of copper. On the other hand, it has the disadvantage of requiring a considerable quantity of sulphurous acid, which, if not furnished by the ore itself may not be conveniently obtained. Sulphurous acid is also used in the former Hunt & Douglass process, but not in such quantity, and only as an adjunct which is not always indispensable.

We respectfully call attention of such of our readers, or anybody else, who would be desirous of manifesting an interest in operating a mine, to the advertisement of the "Eclipse gold quartz mining company" in another part of this paper. It adjoins immediately on the north the celebrated Keystone mine, which is hard by in the south. The right of claim is protected by a United States patent.

The Sierra Nevada and Utah mines will presently be connected on the 2500 level. When this is done one may start from the latter mine and travel underground over a mile to the southward from mine to mine.

Assessments.

The fact that assessments are levied on the stock of Comstock mines, seems to worry some of the Eastern mining stock papers considerably. They are continually harping upon the fact that about $70,000,000 have been put into the Cometock in the shape of assessments; but they do not say very much about the $320,000,000 yield or the $112,000,000 dividends from the same mines. California and Con. Virginia, between them, produced nearly $130,000,000, or almost double all the assessments levied on all the mines on the whole lode.

One paper is astonished particularly at the assessment paying, and says: "Neither benevolence, patriotism nor encouragement of home industries seems to be the aim of the constant assessment payer. He seems to be laboring under a hallucination for which materia medica prescribes no cure—the craving for a bonanza."

There is a good deal of "general principle" twaddle going the rounds, originating from Eastern papers, on this subject. When people go into mining they always expect a bonanza. If they do not look for a bonanza in the mine they do for one in the stock. When they put money into stock they expect to sell for a higher price or to get dividends. If no dividends come, and stock does not go up, they try to make a "boom." If the boom slips up they try and sell out for what they can get without reference to the result to the buyer. This is not only human nature, but what the world calls business.

In the matter of assessments, if people expect that the mine will pay, they are willing to pay themselves to put it in shape to do so. Shafts do not sink, drifts run or tunnels extend without muscle or brains, and muscle and brains want money. If people didn't think they'd make something out of it they wouldn't invest. They don't invest for the privilege of paying assessments, as one would suppose from reading some Eastern journals. But when assessments are levied, if people think they have a chance of making something out of the mine or a subsequent rise in stock, or they think they can save part of a bad investment, they pay; otherwise they do not. It is purely a business proposition, the chances of which are taken when the first investment is made.

All the sympathy expended on assessment payers is wasted. In regard to the Comstock, work done as the result of assessments has developed bonanzas in a number of the mines, and those who pay assessments now, hope for the experience to be repeated. They are not trying new experiments. They are doing something that has been done before. Some of the experience has resulted in bonanzas, and some in horrascas. Those who met the boracas lost only their small investments; those who struck bonanzas gained in some cases a thousand-fold on their investment.

These circumstances make men invest in a region where bonanzas may be uncovered any time, and make them pay unwelcome assessments more readily than might be imagined. All the advice given them will not change their minds, and this is more particularly the case where the newspapers offering it, give aid and countenance to obscure stock for sale in unknown regions where bonanzas are unheard of, real mines never seen, 50-ft. shafts the rule and dividends the exception. None of the Cometock mines have any prospectuses to publish in these journals, or any kind of advertisements to insert; and when one sees these mines, which have produced millions, and are fully equipped for work, on a lead where bonanzas may be found anywhere, constantly maligned, while others, which have not machinery, shafts, ledge, or anything but stock, but which publish page prospectuses and flaming advertisements, as constantly held up as models for investment, the thinking man is apt to conclude that advice from such sources is not entirely disinterested.

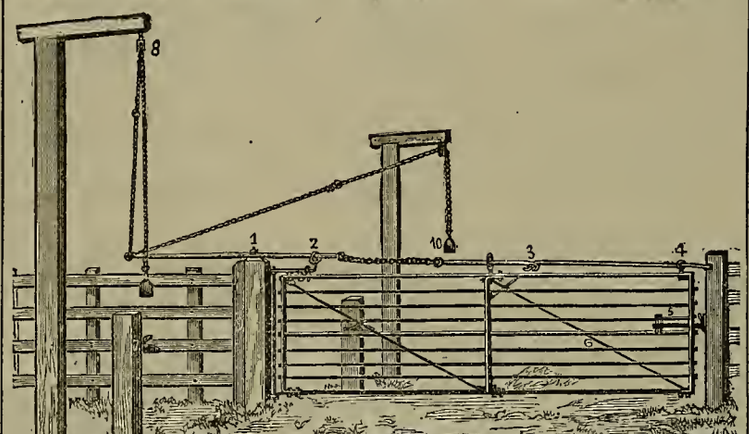
A gradual reduction in the custom tariff is proposed in Spain.

A New Farm Gate.

The engraving on this page represents a new farm gate invented by Alfonzo P. Campton, of Rohnerville, Humboldt county, California, and which is taking well wherever introduced. The principal features of the invention is the horizontal lever hinge pivoted on top of the upper rail of the gate, this lever hinge being provided with an eye or loop, through which is passed the front end of a horizontal lever, which is pivoted on the top of the gate-hinge post, and has its forward end attached to a sliding latch. Suitable cords are attached to this horizontal lever, and these loose ends led to the proper position to be grasped by a person on horseback or in a vehicle.

The operator, on horseback or in a vehicle, approaching the gate, pulls the cord marked 10 in the engraving, thereby moving the lever, 1, laterally on its pivot. This lever, 1, then presses sidewise in the eye or loop, 2, moves the hinge of which this eye or loop forms part on its pivot, with the effect of drawing taut on the chain, whereby the gate is inclined from its vertical plane and raised on its lower hinge or pintle, and by the same means the latch, 3, is drawn from the catch, 4, while the swing of the same gate also liberates the catch, 5. A continuous pull upon the cord, 10, throws the gate open against one of the catches, 7. After passing through the gateway the operator will pull the opposite cord with the effect of releasing the gate from the catch and restoring it to its primary condition. The cords are led through pulleys, 8, on suitable posts so as to be in convenient position.

The latch used on this gate is such that it cannot be raised by cattle, hogs, or other animals. The corner post, 9, is firmly planted in the ground, so as to sustain the gate without



CAMPTON'S CHAMPION FARM GATE.

allowing it to sag. The gate is preferably made of iron. This gate took the first premium this year at the California State fair, the Stockton fair, the San Jose fair and the Ninth District fair, in Humboldt county. The inventor desires to sell State and county rights. Quite a number of gates of this pattern are in use, some of them being even sent to Mexico. Mr. Campton calls it the "Champion gate."

New Miner's Pick.

P. W. Reardon, of San Jose, has just secured through the Mining and Scientific Press Patent Agency a patent for a mining or grading pick of new design, the principal feature being a novel means of adjusting points to the head or stock so that the points can be removed when worn or injured and others substituted.

The shape of the stock is such as to leave shoulders upon its outer side. In its ends are beveled sockets. From the bottom of the sockets extend inclined tapering holes, which open out at the shoulders.

The pick point has an ordinary curved point or blade. Its rear end is cut away to form a beveled projection, from which extends a tapering shank or stem. The end of the shank is provided with screw threads, and is adapted to receive a nut.

When the point is fitted to the stock, the shank extends through the hole and projects on the outer side at the shoulder. The beveled projection fits within the beveled socket, and the shoulder of the point which is formed by the projection, fits against the end of the stock. When the point is well in place, a nut is screwed onto the end of the shank, and when set up tight against the shoulder, holds the pick point and the beveled projection. When a blow is struck, the point has a tendency to be driven in further and held more securely. The loosely-tapering stem or shank is also tightened by drawing, and holds the point in place, and the nut can be tightened to the extent of the strength of the screw threads. The device is quite simple. The removal of the nut allows the point to be taken out with ease, and can be inserted again with facility.

Mining Decision.

The Supreme Court at Yankton, Dakota, has confirmed the decision of the U. S. District Court of the Territory in the case of Mahler vs. Golden Terra Mining Co., in favor of the plaintiffs. The District Court decision was published in the law journals of this city at the time, and favorably commented upon. This confirmatory decision is the final judgment in favor of the Gopher Con. G. M. Co., the suit for which was fought by the Gopher interest against the Golden Terra company, the principal owners of which were Messrs. Haggin & Hearst.

The attorneys in the case were Garber & Thornton and McLaughlin & Steele for plaintiffs, and Hillhouse, Corson & Thomas for defendants—Golden Terra Co.

It is generally understood that the control of the Gopher stock was purchased by Mr. Haggin after the case was decided by the District Court. In view then of this recent decision, which confirms the former one, which absolutely invalidates the Ophir title, and the fact that a suit for heavy damages against the Golden Terra would inevitably follow, instituted by the Gopher company for ores extracted from their ground by said corporation, the purchase of the majority of the Gopher stock was a wise business transaction.

The ground covered by this decision has always been regarded as the richest portion of the main vein, extending from the Homestake mine on the south to the Father De Smet on the north. The hotly contested suit for the ownership of this ground and subsequent purchase of the control of the Gopher stock, is conclusive evidence of the great value of this property. The stockholders in the Gopher company are to be congratulated on this recent decision, and under the able management of Messrs. Haggin & Hearst this mine should soon take a place among those paying dividends.

British Columbia Mines.

We had an opportunity of conversing this week with Major Downie of Nevada City, who has just returned from a prospecting expedition on the northern coast. He left here last April, going by steamer to Victoria, and then to Bellahella. Taking a canoe and some Indians, he has explored a great deal of the British Columbia coast, examining some galena and silver lodes he knew of. Where he expected to find his best ledges, he says the ground was covered up with snowslides and slides from the mountains.

He says that he found good prospects of galena at different points on the coast. He aimed, however, to find those near to the water and easy of access.

At the head of Donglas inlet he found silver ore running $35.68 per ton, the lead being well defined and some seven or eight ft. wide. This was within half a mile of the water. He has found a great deal of copper ore. Douglas inlet, or Kitahmat, as it is called, is the site of a large Indian village.

Major Downie went to Fort Wrangell by steamer, and then on up the coast with the canoe. He has found two or three galena claims which he is confident will prove valuable. The Indians in that region are all peaceable, and he had no trouble with them at all, they being well disposed all along the coast.

Major Downie has showed us a great number of specimens of ore, principally copper. He has secured several good ledges for the company in whose interests he went up. He says that all along the coast new salmon fisheries are being established, and that this great industry is rapidly growing. Major Downie has promised us further particulars regarding his prospecting trip as soon as he reports to his company.

The Brush Dam Burned.—The other day when the Debris Committee went to visit the famous brush dam, the party went along the dam about one mile, over the deposit of slickene. Some persons, who must have done it through malice, had set fire at the north end of the brush dam, and it being fanned by a steady north wind, had already burned about 600 ft., and was progressing rapidly to the south. Men were sent for from the levee work below to extinguish the fire, and were busy at work at it when the committee and party left. The discovery of the fire occasioned a great deal of excitement among the representatives of the farming and mining interests who were accompanying the committee. The well-known hostility to this brush dam system among the farmers prompted some to insinuate that they knew something about the origin of the fire. Others hinted that people in the vicinity who held $60,000 worth of the State scrip issued in payment for the work and made valueless by the recent decision of the Supreme Court, might have sufficient bitterness against the projectors of the dam to want it destroyed.

The hoxing up of the hot water in the Imperial and Alpha mines, in sub-drains buried several inches below the floors of the drifts, has greatly cooled the 2800 level of those mines. Before the water was so disposed of the drifts were filled with blinding and scalding steam.

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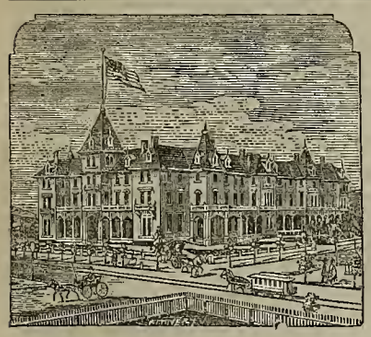

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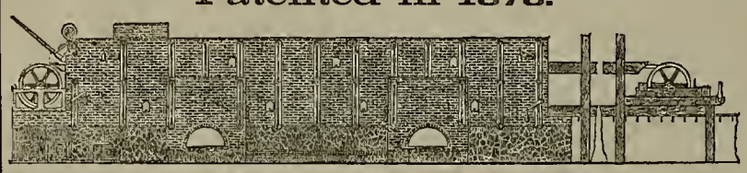

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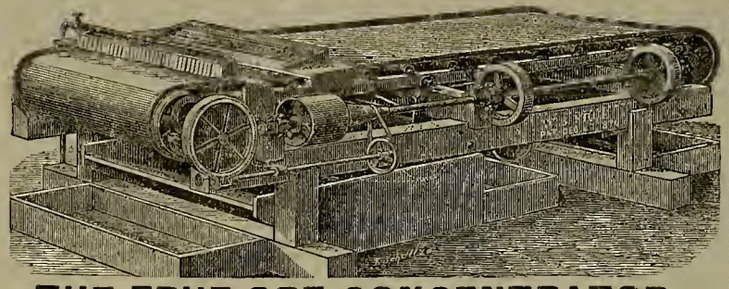

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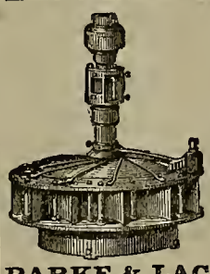

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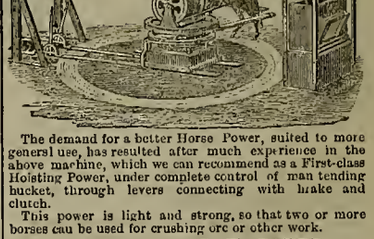
SAN FRANCISCO, CAL.

SELBY SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.
Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

Mines and Mining Properties Solicited for Sale.
I have unexampled facilities for rapidly placing Mines and Mining Properties, and claims of
Ascertained Value
Upon the Market, through my Branch Offices in
NEW YORK, BOSTON, PHILADELPHIA, CHICAGO, ST. LOUIS, LONDON, ENGLAND.
OWNERS OF
Meritorious Mines and Prospectors
WHO HAVE NOT THE MEANS TO PROPERLY DEVELOP THE SAME MAY FIND A PURCHASER THROUGH MY OFFICE.
If You Have a GOOD MINE, or a GOOD PROSPECT for sale, apply to me in person or by letter.
JAMES. A. MARS,
45 to 49 Merchants' Exchange, California St
SAN FRANCISCO, CAL.
REFERENCES:
London and San Francisco Bank, S. F., Cal.
Anglo-Californian Bank, S. F., Cal.
John J. Valentine, Superintendent Wells, Fargo & Co.'s Express, S. F., Cal.
J. B. Haggin, Capitalist, S. F., Cal.
Louis A. Garnett, Capitalist, S. F., Cal.
Daniel Meyer, Capitalist, S. F.
Prof. Thos. Price, M. E., S. F., Cal.

New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
Agent and Manufacturer of Mining Machinery
38 and 40 Main St., S. F.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING OCTOBER 11, 1881.

248,143.—FRUIT BOX—R. J. Cook, Sacramento, Cal.
248,157.—ICE MACHINE—C. W. Gelett, Oakland, Cal.
248,171.—AMALGAMATOR—A. R. Hamlin, Alameda, Cal.
248,097.—LIFE BOAT—A. Holmes, Petaluma, Cal.
248,122.—ORE PULVERIZING MILL—W. I. Tustin, S. F.
248,235.—ROAD WAGON—E. B. Towl, Franktown, Nev.
248,034.—CAR COUPLING—H. L. Gibbe, Calistoga, Cal.

FOR THE WEEK ENDING OCTOBER 18, 1881.

248,442.—BOILER COVERING—O. C. Fowler, S. F.
248,803.—STEAM AND WATER STEERING APPARATUS—John Oates, Portland, Oregon.
248,307.—BOTTLE COVER—Grisel & Cooley, S. F.
248,311.—TURNTABLE—Edward Haley, San Jose, Cal.
248,330.—BALLOT BOX—David Lindenborn, S. F.
248,482.—STRAIGHTWAY VALVE—Thomas J. Loftus, Sacramento, Cal.
9,895 (Reissue)—PROCESS OF, AND APPARATUS FOR MANUFACTURING ILLUMINATING GAS—E. P. McCarthy, S. F.
248,493.—HEATING FURNACE—W. H. Moore, Portland Oregon.
248,502.—PICK—P. W. Reardon, San Jose, Cal.
248,353.—LABEL HOLDER—A. Schilling, S. F.
248,357.—GARDEN CULTIVATOR—J. S. Silvera, Camptonville, Cal.
248,524.—DOUBLE OSCILLATING ENGINE—R. L. Stevens, Albany, Oregon.
248,363.—ADJUSTABLE SEAT RAIL FOR VEHICLES—Stimson & Needham, S. F.
248,376.—SOLDERING APPARATUS—W. W. and W. A. Williame, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Learning the Ropes.

The following from the Philadelphia *Record* shows that the Eastern folks are not guiltless of "ways that are dark and tricks that are vain:"

"The *modus operandi* by which sharpers operate in mining companies is bold, yet simple. They buy a piece of land at an insignificant sum, and arrange that the deed shall be recorded with an enormous sum named as the consideration. Then they form a stock company, with a nominal capital ranging from $2,000,000 to $10,000,000, take half of the stock themselves and lay aside the balance, ostensibly for development. A few brokers then take the concern in hand, and by what is called "washing," they sell and resell 100 shares of the stock at, say one dollar a share, making it appear that a share which does not represent one cent of invested capital is worth that sum. After the stock has become fairly floated, then come the expedients for squeezing the innocents."

Another trick was as follows:

"One company, which had a good mine, fell into the control of a crowd of sharpers, who have terrorized the puny stock lambs. It was done in this way: The company had mined some little ore, and a report was received from the mine superintendent stating that the ore dump was worth $60,000. Immediately the Board of Directors were called together to dispose of the dump. A dividend could not be declared on money not in hand, but an accommodating firm announced that it would advance funds to the amount of $60,000, taking the ore as security. It was thus made to appear that $60,000 had been mined in excess of working expenses, and a dividend of $60,000 was declared—this, of course, advancing the price of the stock from 20 cents to $1.80 per share. Then it was revealed that through an understanding among themselves the ring of directors had not taken any of the dividend, and that the accommodating firm which advanced the funds had not advanced $60,000, as supposed, but only $8,000, which went to those not in the conspiracy. The clique sold out at top prices, realizing more than enough to protect the $8,000 advanced, and the unsuspecting lambs were meanly plucked."

MEXICAN DUTY ON MINING MACHINERY.—It was stated and the impression very generally obtained some months ago that a heavy duty was to be imposed by the Government of Mexico upon all mining machinery, lumber, etc, imported into that country. Afterward it was stated that this measure, meeting with strong opposition on the part of the more intelligent and progressive element in the national Congress, failed to be enacted into a law. This latter however, appears to have been a mistake, the Phœnix *Herald* being informed by Senor Manuel M. Corrella, who recently returned from Hermosillo, where he went on business connected with mining interests of Sonora, that the law of levying an import duty upon mining machinery, lumber etc., did pass and go into effect on the 1st of November. The public ought not to be deceived on this subject, for that leads to unnecessary complications when the importer arrives at the frontier and the duties are demanded. There are already too many causes for complaint, wherefore we should labor to diminish them as far as may be by the diffusion of judicious advice and correct information.

OUR COMSTOCKERS do not think much of the majority of what are called mines down in Arizona. They say that in many instances the deposits upon which Arizona mines are incubating might be dug out and packed away on a jackass at one load. The Virginia *Enterprise* is responsible for this.

Gunpowder and the Stronger Explosives for Mining Purposes.

Following up this subject from the *Journal* of September 24th, we find there are many conflicting opinions afloat as to the relative merits of the old and time-honored explosive agent, gunpowder, and the younger, more vigorous ones, dynamite, tonite, and others more or less connected with the two last named rivals. As we have remarked before, the nature of the ground and work required will have much to do in deciding the question of merit in regard to explosives in general. Gunpowder must always hold its place in very soft ground, or where immense quantities of material have to be displaced to be utilized for special purposes, and where local action alone could not be profitably employed. It may be said to be the parent explosive, and, like all parents, has had to make way for the more robust offspring, and bear the effects of opposition and slight; these have passed away, and users are now beginning to value the several explosives agents according to the merits appertaining to each. Dynamite and tonite we have referred to as rivals; both have their adherents, and each is valued for its special advantages. The plasticity of dynamite is one of its advantages where hand boring is carried on irregularly. Tonite in many formations is said to have more displacing power, to be exempt from noxious fumes, and, unlike nitro-glycerine explosives, requires no thawing, an advantage which is without doubt appreciable. We are informed that the consumption of tonite is extending. There is evidently a wide field for both, and we should say, for all the explosives we have named in connection with work to which each is specially adapted. We are also informed that experiments on a large scale have been recently carried on in the chalk formation with a view to combining the advantages of gunpowder with tonite, and that the results have been satisfactory, the saving of time and labor, and the quantities displaced as compared with the old system, being very great. These experiments are being continued, and we hope to obtain further particulars, with a view to placing them before our readers on a future occasion.

We would wish to remark that the results of trials are often marred through want of supervision on the part of those who are most anxious to arrive at a fair result, want of time on the part of a manager, or too much reliance on the opinion of workmen, who are generally more or less biased one way or the other, too frequently result in hasty and imperfect conclusions being arrived at. It is of the highest importance, therefore, whenever an extended trial of this nature is in hand, to have the strictest supervision possible carried out, to have the charges regulated according to the work to be done, and their effect noted in each case.

Another point we would wish to remark on is the necessity of compelling workmen to attend to the instructions which accompany all explosives, it being generally admitted that miners, as a rule, are apt to disregard such instructions. They should remember that the stronger an explosive is the greater necessity for caution, irrespective of the safety of the material they are handling. This refers to all, and more especially to nitro-glycerine, explosives, when handling the latter in a frozen state, and we are now fairly launched into cold weather. The accidents which frequently take place in carelessly manipulating nitro-glycerine explosives when frozen, will justify these remarks. Immunity from accident for a time generally engenders laxity in use, and we may, therefore, be excused for thus touching on the necessity of caution, when dealing with the subject of explosives generally, and trust our remarks will be taken in good spirit, as intended.—*London Mining Journal.*

ARMAGOSA.—Says the San Bernardino *Index:* The celebrated Armagosa mine has recently been purchased by the South Pacific mining company of New York. The company intend to erect a 20-stamp mill at once and increase the number of stamps to 56 within four months after the first 20 are completed. The mine itself is wonderfully rich and well opened. Under its former management it yielded ore of enormous richness—one blast of two tons having yielded $11,000, and the 5-stamp mill $58,000 in one month. Of course the ore was selected, yet this shows the possibilities of this great mine. As many of our readers are aware, the Indians massacred the miners and burned the company's mill, which was a death-blow to the old company.

IF SATISFACTORY ARRANGEMENTS can be made with the Virginia City and Gold Hill water company the big hydraulic pump at the Chollar-Norcross-Savage shaft will be run by a stream of water turned directly into the feed column. This would do away with the surface machinery and the return column now forced up to the top of the ground. All the water would then pass out at the Sutro tunnel level and the pump would run right along almost as though by perpetual motion.

BY ADVERTISEMENT in another column it will be seen that Hale & Co. are in want of some mining property for the New York and London markets. Mr. W. E. Hale was formerly of the firm of Hale & Pacheco, brokers. Mr. Hale has been some 10 years or more in business here in this city, and is well known to the mining community.

News in Brief.

DEER are plentiful in Mendocino, Humboldt and Trinity counties.

FRANCIS A. WALKER, superintendent of the census, has resigned.

GEESE, ducks and cranes are making their appearance on the San Joaquin.

MINOR PENALTIES have been discovered in the U. S. Treasury Department.

WILD pigeons in great numbers are reported in Putah canyon, Solano county.

THE Chinese quarter of Dutch Flat was entirely destroyed by fire last week.

TWO Indian hunters lately brought a deer to Chico which weighed 168 lbs. Its antlers had seven prongs.

EDWIN D. MORGAN has been selected by President Arthur as Windom's successor, as Secretary of the Treasury.

THE relics of the Franklin expedition recovered by Lieut. Schwatka have been placed in the museum at Greenwich hospital.

CHOLERIC fever is raging at Umritsir, India. Nearly all the shops are closed. Not a single European escapes the disease.

THE sawmills at Lake Tahoe have shut down for the season, and most lumbering operations have been suspended till next spring.

THE Atlantic house and buildings on Salisbury beach, Mass., have been burned. The loss is $20,000. Insured.

LANDER COUNTY, Nev., has reduced the Central Pacific assessment from $16,000 to $10,000 per mile for main track.

RAISIN packing is progressing rapidly in Riverside valley, and three-fourths of the crop is now either packed or in sweat boxes.

THE original sum of £500,000 given by the late George Peabody in 1862, as a fund for building a lodging-house for the poor in London, now amounts to £720,000.

CAPT. HOWGATE has entered a plea of "not guilty" to the charge of embezzlement. He has been committed to jail in default of bail, fixed at $30,000.

THE American Humane Association have decided to bring into the Supreme Court of the United States a test case of the cruel treatment of stock in transit on railroads.

WITH a view to cover the deficit in the Hungarian revenues, it is proposed to introduce a tax on petroleum, revise the customs tariff and increase the tax on alcoholic spirits.

THE Piutes are bringing in wild ducks from the Sink of the Humboldt, which they peddle about Virginia City. The say wild fowl are very abundant at Humboldt and Pyramid lakes.

SHAW, United States Consul at Manchester, has visited Oldham to inquire into the grievances of mill owners regarding the alleged pressence of sand in bales of American cotton.

THE Socorro *News* says: The turquoise in the crown of Russia came from the mines of New Mexico nearly two centuries ago. It is the largest and finest stone of the kind in the world.

THE Lower Lake *Bulletin* says: Lake county abounds in mineral wealth, yet there is scarcely another portion of the State that has been so little prospected.

THE Chico *Record* says: Some days since a party of hunters on the Liano Seco ranch, broke camp, leaving their camp fire burning, and 400 or 500 acres of pasture land were burned over.

TRICKETT, the Australian oarsman, has sent a formal challenge to Hanlan to row a three-mile race on Crevecœur lake for $1,000 a side and the championship of the world, at about the end of November.

THE Cloverdale *Reveille* says that the recent free on the coast have driven a great many deer and fawn into the adjacent valleys, and the stages either bring them in or report them as numerous all along the line.

ADVICES from Panama of the 15th say: The Interoceanic Canal Company has bought the Grand hotel of this city for $206,000, and it will be converted into offices for all departments of the company.

IT IS understood that Senator Miller has prepared a bill providing for a simple form of government for Alaska, which meets the approbation of all the prominent men interested in the Territory. It simply provides for a court having general jurisdiction, for an executive officer and for a delegate in Congress.

THE movements being made on the Donahue railroad survey between Cloverdale and Ukiah, are of that positive nature that the residents of this upper country are beginning to draw long breaths. The survey between those two places is completed, and every assurance given that the work will be commenced early in the spring.

THE New York *Herald* prints another full page of Arctic correspondence, on which it editorializes as follows: Prof. John Muir thinks that the *Jeannette* pushed directly north through the long lane of open water extending at least 100 miles southward from Herald Island, looking like an open river between the banks of ice, which was frozen to the shallow bottom. The stream which flows through this opening off the east coast of Wrangell Land is said to be set northerly, at the rate of about two knots an hour, and clearly indicates an opening farther north, whence millions of young geese come. Swedish reports confirm this view of the opening, and it is highly probable that the *Jeannette* saw it and pushed as far northward as possible, which would fully account for the *Corwin's* failure to discover any trace of the *Jeannette* on the southeast coast of Wrangell Land, where alone she made any search.

Business and Patent Office Removal.

After October 29th, our friends and patrons will find the business offices of Dewey & Co. removed from No. 202 Sansome St., to No. 252 Market St., on the northeast corner of Front and Market Sts. We have secured the entire upper floor of Nos. 250 to 252 Market St., and No. 12 Front St., where we shall have permanently more spacious and pleasant rooms for the accommodation of our increasing business. Our apartments will have two main entrances as shown in the following engraving, viz:

OUR STAIRWAY, No. 252 MARKET ST.
OUR ELEVATOR, No. 12 FRONT ST.

The building we have now occupied between four and five years is to give place to a new one, which fact causes our removal.

Old and new friends are cordially invited to give us an early call in our new quarters.

Mining and Scientific Press.

THE MINING AND SCIENTIFIC PRESS is the leading mining journal in America, and enjoys a larger circulation among the more intelligent operators and workers in the gold fields of the world.

Established in 1860, it has firmly maintained its position as a reliable, progressive journal. The information given in its columns has saved millions of dollars to the practical miners, metallurgists, mill men, mine and shareholders on the Western side of our continent.

Among its contributors are the ablest and most experienced mining engineers, superintendents and practical miners in this country.

The PRESS gives a condensed summary of Mining News from the most important mining districts of the country.

New processes and methods of mining are described in its weekly issues. New mining machinery and improvements are frequently illustrated and explained in a manner to be of great value to all interested in mining.

As a scientific and mechanical representative of the Pacific coast it is decidedly popular, and a standard journal with the most thrifty industrial people of the Pacific States and Territories. Its authority is of the highest order, and its usefulness in its special sphere unrivalled.

Every public library, mining engineer, metallurgist, mining operator and intelligent mechanic and manufacturer, will find profit by its reading.

Subscription, $4 a year in advance. Sample copies, postpaid, 10 cents.

DEWEY & CO., Publishers.
No. 252 Market St., San Francisco, Cal.

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G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLENER—San Mateo and Santa Clara counties.
C. E. WETMORE—Alameda county.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walls with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

COPP'S "U. S. MINERAL LANDS, LAWS, FORMS, INSTRUCTIONS AND DECISIONS."—1881. 570 pp. In full law binding, $4.50; half law binding, $3, at this office.

San Francisco Metal Market.

(WHOLESALE.
WEDNESDAY, October 26, 1881.

IRON —			
American, Pig, soft, ton	—	@	30 00
Scotch, Pig, ton	28 00	@	30 00
American White Pig, ton	—	@	—
Oregon Pig, ton	—	@	—
Clipper Gap, White	—	@	30 00
Clipper Gap Car Wheel	—	@	33 00
Refined Bar	4	@	7¼
Horse Shoes, keg	—	@	5 50
Nail Rod	—	@	7¼
Norway, according to thickness	6¼	@	7¼
STEEL —			
English Cast, ₱	14	@	18
Black Diamond, ordinary sizes	—	@	14
Drill	15	@	18
Flat Bar	14	@	15
Plow Steel	—	@	6¼
COPPER, —			
Ingot	—	@	53
Sheet	32	@	35
Sheating, Tinned 14x18	36	@	41
Nails	—	@	—
Bolts	38	@	42
Old	—	@	18
Bar	—	@	23
Cement, 100 fine	—	@	15¼
LEAD —			
Pig	5	@	5¼
Bar	—	@	6
Pipe	—	@	8
Sheet	—	@	9
Shot, discount 10% on 500 Bags			
Drop, per bag	—	@	2 10
Buck, "	—	@	2 30
Chilled "	—	@	3 50
TIN PLATES.—			
10x14 IC Charcoal	—	@	7 70
10x14 IC Coke	6 15	@	8 40
Banca Tin	—	@	25 00
Australian	—	@	39 00
I. C. Charcoal Roofing 14x20	—	@	6 90
ZINC.—			
By the Cask	—	@	9
Zinc, sheet 7x3 ft. 7 to 10 ℔, less the cask	—	@	10
NAILS.—			
Assorted Sizes	4 00	@	4 25

ASK FOR
UNION INDIA RUBBER CO'S.
PURE PARA GUM
CRACK PROOF
RUBBER
BOOTS & COATS
BEWARE OF IMITATIONS!
Be sure the Boots are stamped CRACK PROOF on the heels, and have the PURE GUM SPRINGS on the foot and instep which prevent their cracking or breaking. They will last twice as long as any others manufactured.
FOR SALE BY ALL DEALERS.
ALL KINDS RUBBER
BELTING PACKING HOSE.
SPRINGS CLOTHING
BOOTS AND SHOES, ETC.
Goodyear Rubber Co.
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AGENTS, SAN FRANCISCO.

Portable Mulay Saw Mill,

With improvements recently made is unequaled as a neighborhood mill. It can be run by either steam or water power, and is especially adapted to the engines used for threshing.

It may be operated by either two or three men, and will cut as much lumber in proportion to the power and number of hands employed as mills of larger capacity.

It makes smooth and even lumber, leaves no stubshot, and will cut any sized log up to four feet in diameter.

It may be transported from one locality to another and re-erected ready for sawing in from two to three days, and can be made profitable in localities where there is not sufficient timber to justify the erection of a large mill. Send for descriptive circular, price, etc., to

CHANDLER & TAYLOR, Indianapolis, Indiana.

We also build the heavy Standard Circular Saw Mill, with either one or two saws as well as the Pony Circular Saw Mill that is capable of being run with light power. We also build Stationary Engines of varied capacity; also, portable Threshing Engines.

WANTED!

Several Good Dividend Paying

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None but First-class Mines wanted.

Apply to

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The salubrity of the CLIMATE and beauty of the SCENERY is world-renowned.

W. G. GRAHAM, Proprietor.

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Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Belcher Silver Mining Company. Location

of principal place of business, San Francisco, California. Location of works, Gold Hill, Storey county, Nevada

Notice is hereby given, that at a meeting of the Board of Directors, held on the twenty-ninth (29) day of September, 1881, an assessment (No. 28) of one dollar ($1) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 8, No. 327 Pine street, (Stock Exchange Board Building), San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the first (1) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the twenty-fourth day of November, 1881, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors

JNO. CROCKETT, Sec'y.

Office—Room 8, No. 327 Pine St., (S. F. Stock and Exchange Board), San Francisco, California.

Franklin Gravel Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Dutch Flat, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the Fourteenth (14) day of October, 1881, an assessment, (No. 7) of Thirty (30) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 310 Pine street, Room No. 44, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fourteenth (14) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Fifth (5) day of December, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

GEO. R. SPINNEY, Sec'y.

Office—No. 310 Pine St., Room No. 44, San Francisco, California.

Newcastle Gold Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Yankee Hill Mining Dist, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Twenty-third (23) day of September, 1881, an assessment, (No. 2) of two (2) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 33, No. 318 Pine St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the First (1) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Twenty-first (21) day of November, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

E. G. MATHEWS, Sec'y,
Office—Room 33, No. 318 Pine St. San Francisco, Cal.

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KUSTEL'S CONCENTRATION OF ORES (of all kinds), including the Chlorination Process for gold-bearing sulphurets, arsenifurets, and gold and silver ores generally, with 120 lithographic diagrams. 1867. This work is unequaled by any other published embracing the subjects treated. Post-paid, $7.50. Printed and sold by Dewey & Co., S. F.

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The Sweepetake Plow Company's Works have been removed to

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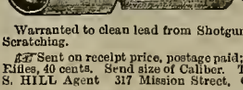

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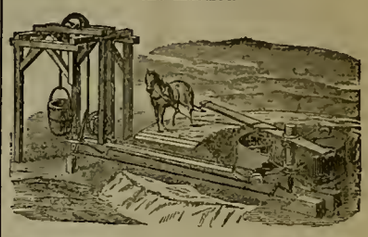

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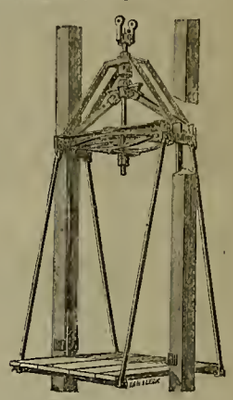

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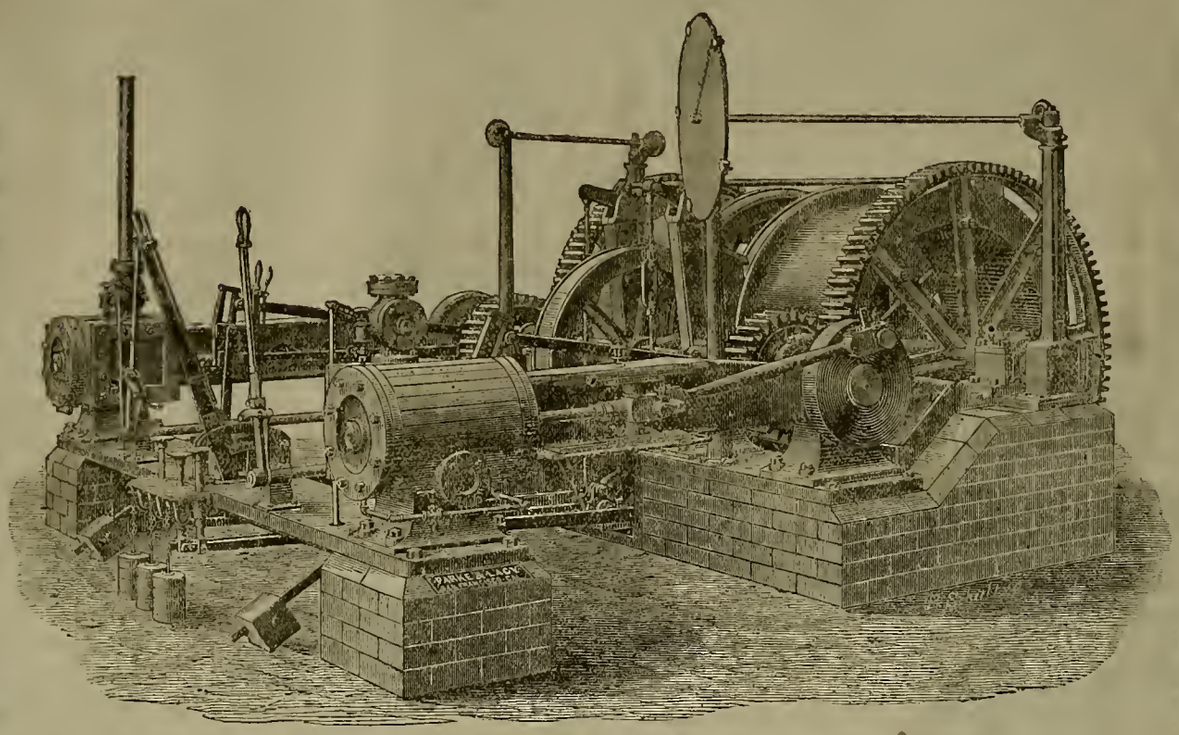

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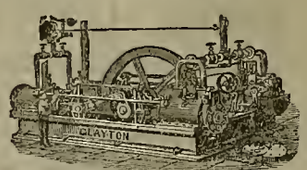

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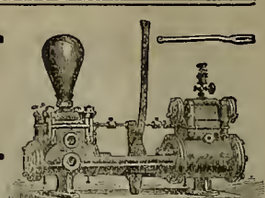

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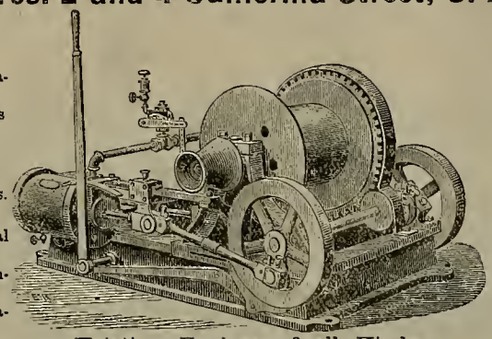

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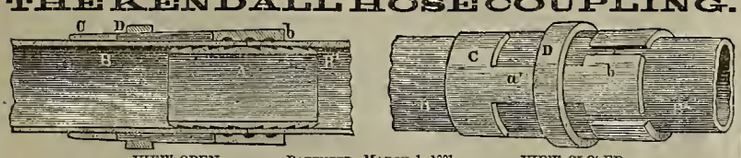

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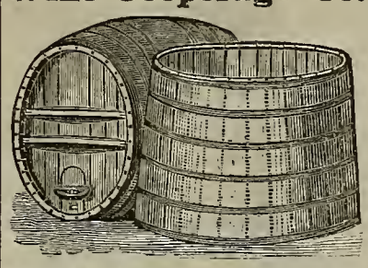

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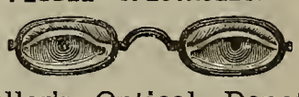

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, NOVEMBER 5, 1881.

VOLUME XLIII Number 19

Tustin's Ore Pulverizer.

It has been admitted hy many mining engineers that the rotary mill was snperior to the old system of stamp mills, if a snitahle machine could only be constructed for [securing all the advantages of the rotary principle; and nnmerons inventors have been endeavoring dnring the past few years to devise the hest adapted and most appropriate constrnction and arrangement for this pnrpose. In a measnre several of them have snccesded, bnt none of them have heen sufficiently perfect to take the plsce of the stamps nnder all circnmstances until the mill shown npon this page came to the front, and this, the inventors claim, will fnlfill all the conditions.

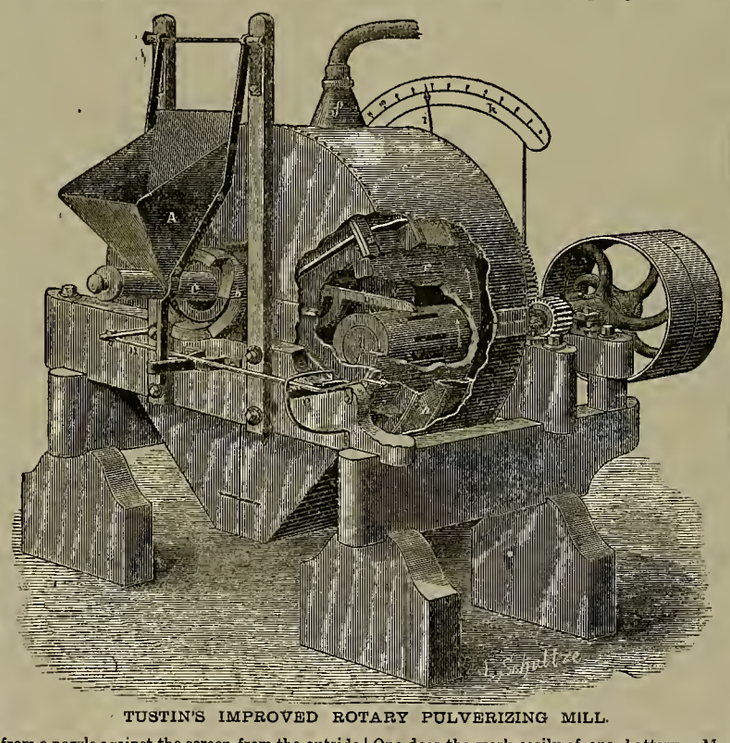
The Tnstin rotsry ore pnlverizing mill pulverizes ore wet or dry, and needs hnt a fraction of the power that the stamp mill requires. It feeds, crnshes, pnlverizes and screens the ore hy a continnons and speedy operation, and it has antomatic attachments wherehy the feed and working of its parts are regulated fully as systematically and positively as any other crnshing mill can he.

Like all other rotary pnlverizers it has a hollow cylinder or harrel which is mounted on hollow trnnnions and is driven hy gearing at one end of the machine. The harrel or cylinder, however, has a channel or trough extending aronnd it midway between its ends. The hottom or exterior of this trongh or channel is covered by a soreen of suitahle mesh. The interior of the harrel is covered hy a removable metallic lining which extends across the chanuel or trough and has transverse slots made throngh it directly opposite the trongh or channel. Inside of this harrel or cylinder the inventor places two or more iron cylinders or rollers, which extend across the bottom from side to side, and travel on the lining when the harrel revolves. It will therefore he seen that the ends of the rollers or cylinders rest and move npon the solid portion of the lining on each side of the slots. A flsnge or rim projects into the harrel aronnd the center opening in each head or end of the barrel, and the rollers rest npon the harrel helow these rims. A shaft passes across the center of the cylinder, on which is a loose head or sleeve. Two radial arms, marked *m* in the engraving, extend from the axial head or sleeve, one on each side of the series of rollers. This sleeve is connected with a pointer or indicator, *i*, on the ontside of the machine, and this pointer is arranged to move across an indicating scale, whioh is gradnated or divided into eqnal spaces. Now, when tho barrel is rotated, the friction will carry the rollers a short distance np the side of the cylinder, and the distance which they are carried np the side will he in proportion to the amount of ore contained in the harrel. As the rollers are carried up the side of the cylinder, they strike the radial swinging arm above them and move it np with them thus rotating the sleeve to which the arms are attached, and cansing the pointer to indicate on the scale the height to which the rollers are carried.

The greater the quantity of ore in the harrsl the greater will he the friction encountered hy the rollers, and the higher up the eide of the cylinder will they he carried, so that the pointer will always indicate how mnch ore the barrel contains. The channel or trough which snrronnds the rim of the harrel has partitions at intervals apart, and a wide slot or opening is made in the lining close to each partition. As fast ae the ore ie reduced to a oondition fine enongh to pass through the slots in the lining, it will fall throngh npon the screen, when the particles which have heen snfficiently reduced will pass through the screen. The large partioles will he caught by the partition, or rather shelf which extends across the channel and he carried up until the elevation causes it to drop through the wide opening or slot hack into the harrel again. The rollere are grooved or provided with pockets, which extend lengthwise of them so that, as they are caneed to rotate by the friction of the harrel traveling under them, the pockets will serve as huckets to catoh the ore which is ahove them and throw it over in front of them again.

The ore is fed into the harrel from a suspended hopper at one end of the machine, and is oondnoted by a spont or tnhe throngh the hollow trnnnion of the harrel. This hopper is snspended, and a ratchet device on the end of the rotating trnnnion keeps it agitated hy giving it snccessive knocks or concnssions hy which the ore is cansed to move forward throngh the tnhe into the harrel. The position of the hopper with reference to the ratchet device is adjnstahle, so that the force of the blow or concussion can he regnlated in order to increase or diminish the feed. To render the feed entirely automatic, the inventor has devised an ingenions device for connecting the swinging hopper with indicating pointer, so that when the pointer is moved over hy an excess of ore in the harrel, the hoppsr is moved outward, so as to lessen the feed.

In crnshing wet, a stream of water is directed



TUSTIN'S IMPROVED ROTARY PULVERIZING MILL.

from a nozzle against the screen, from the outside of the harrel. This hoth keeps the meshes of the screen clean and free, and supplies the water for reducing the ore to pulp, as a large proportion of the water which is directed against the screen will pass through the meshes of the screen into the harrel.

The construction and arrangement of the parts of the machine have heen decided npon with great care and attention, and the result is, that the machine has withstood as severe tests as it will ever meet with in practical work.

The rotary cylinder or harrel is enclosed in an outside shell or case, and it has a channel or hox entirely aronnd it, midway hetween its sides; *n* is the screen which covere the outside of the channel; slots or grooves marked *r*, allow the ore in the harrel to drop through onto the screen when it is reduced sufficiently fine; *d* are the grinding rollers, two or three of which can he used. The rollers have pockets made in them, which serve to throw the ore continually to the front; *f* is a water pipe through which water is delivered npon the screen, hoth to keep it clean and snpply water to the interior of the harrel. *A* is a suspended ore hopper, and *C*, the feed tnhe which passee through the hollow trnnnion and conducts the ore from the hopper into the harrel; *b* are inclined planee or teeth, which are carried by the rotary barrel and serve to jar the hopper and make it feed; *m* is one of two arms which are suspended on an independent shaft in the center of the bsrrel, one of which extends out on each side of the rollers, *d*; *i* is a pointer which is attaohed to the shaft that the arms, *m*, are secnred to; *k* is an indicating scale. This pointer indioates the quantity of ore in the harrel. The shaft to which the pointer is sttached is also connected with a system of levers, of which only one is shown, by which the feed is antomatically regnlated hy the same means that regulate the pointer.

This machine has heen [secnred hy letters patent of the United States. For further particulars address W. I. Tustin, No. 308 Mission street, San Francisco, Cal.

DODGE'S CONCENTRATORS.—Mr. M. B. Dodge has lately pnt two of his patent ore concentrators in Valentine's mill, Calaveras connty, where they are working well and giving satisfaction. One does the work easily of one battery. Mr. Dodge has just received a second order for these machines from the Rosario Mining Co., of Honduras. They have used the concentrators for six months, and having proved their efficiency, now send for more, Two were shipped, also, to Utah last week. At the lower end of the table of this machine ie a receptacle to receive auy fine mineral and quicksilver that might he left in tho gangue while passing over it, which can he removed from time to time, or discharged continuonsly. This ie one of the great advantagee claimed for this concentrator ahove all others. Slime mineral will not go against the current, hut will settle in the lower depression or well, and can he removed hy a shovel.

A CITY LEDGE.—The *Mountain Democrat*, El Dorado connty, saye: Wesley Keller is opening a quartz ledge on hie residence lot, Coloma etreet, thie city, from which he proposee to have a crushing of 20 tons made at the Brewster mill. He has already taken out 17 tons, a portion of which has heen delivered at the mill. He has made frequent prospecte, all of which have heen flattering.

NEGOTIATIONS for a commercial treaty between France and Italy will soon be satisfactorily concluded.

Water Jacket for Smelting Furnaces.

George W. Fogg, snperintendont of the Pacific Iron Works, of this oity, has just ohtained throngh the MINING AND SCIENTIFIC PRESS Patent Agenoy, a patent on a new form of water jacket for smelting furnaces. The improvements consist in a peculiar constrnction of a donhle inclosing wall forming the water space; and also in the employment within this water space of an intermediate cylindrical diaphragm, which is so snpported as to leave a space at top and hottom throngh which water may pass, so a circnlation may be kept np and the interior surfaces he kept cool.

Water is admitted into the space between the walls of the furnace, throngh pipes that may enter at any point, preferably near the hottom. The water is discharged throngh suitahle pipes, a current being kept np hy pump, pressure tank or other means.

In order to keep np a more perfect circulation and hring a cold body of water against the inner hot wall of the furnace, an iron cylindrical shell is formed of snch a size that it will he a vertical cylindrical partition between the outer and inner walls. This shell is made so as to leave a space above and helow, and is snitahly hraced, holted and supported.

Water heing forced in will flow to a point where it can pass helow the lower edge of the partition shell and thence np hetween it and the inner shell to the top. In its upward passage it flows also aronnd the tnyere-openings, and is also caused to spread around the inner cylinder. At the top it flows ontward throngh the upper passage, and the cooler water descends hetween the outer shell and intsrmediate shell to the hottom, and thence flows npward again in the narrow space hetween the intermediate shell and inner wall.

By this construction a strong onrrent of cold water is continnally forced against the inner wall of the furnace, and thns this wall is kept cool, and tho water is nsed with the greatest economy, heing forced in at all sides of the furnace. When it hecomes warm the heated portion will escape throngh the pipee at the top, the flow being snitahly controlled.

San Luis Obispo Mines.

During a recent trip down the ooast, the writer was shown, while at Cayucos, San Luis Obispo connty, some ores from the Polar Star mine, which is about 40 miles from Cayncos, and 14 from San Simeon. The ore contains about 2% to 2½% of quicksilver. Mr. David Lippman, of Cayuoos, informed ns that considerahle of this good rock is now being taken from the mines.

This mine was opened some years since, but was eventnally given up hy the company then at work, as it did not pay. Messrs. Whittaker and Slooum took hold of it afterwards and more thoroughly prospected it, working nnder a lease from the old company.

The ore comes from a tnnnel which was originally run by the company; but the tunnel at that time failed to find ore. The new parties, with more experience, hranched off from the main tunnel line a little, and struck this ore. They now have the old Bentley furnace at work on the ore from this tunnel. The old company spent eeveral thousand dollare on the mine, which they never got hack; hut the indicatione now are that the mine will pay. A few men are now at work and shortly some 15 men will he employed. The tnnnel hae been timhered and put in good shape, those having charge now heing practical miners. We have some specimene of the ore which were given to ns hy Mr. Lipoman.

THE Belcher folks will he the next to benefit hy the Sutro tunnel. It will be a great relief when they can hegin pnmping into the tnnnel. There will he a great difference between the expense of pumping 3,000 ft. and only 1,500. The tunnel ie fast approaching the point where connection with it will be made.

Custom Mill Wanted.

A correspondent of the Salt Lake *Tribune* writing from Marysvale, says:

The Copper Belt Mining Co. are rushing their 10-stamp silver mill to completion as fast as material and men can work.

The country generally shows a healthy and lively appearance. Men who own claims in the camp are filing in every day to do their annual assessment work.

We have not quite yet heard the whistle of the locomotive, but we know that the Denver & Rio Grande is coming. The line is established to this place, and is also extended to Panguitch, a distance of 60 miles south of here. Mr. Robinson is working a grading force in the canyon six miles below here, and another grading force is working in Clear Creek canyon, about 20 miles north of here. Altogether there is more life and animation around about this country generally than there has been for 10 years past. I don't know why it is, but it is a fact, nevertheless, that moneyed men lack confidence in this place or country. Perhaps it is because a few old scalpers, who dream of golden riches, have come to the country thinking to buy good prospects for about $2.50, that they know they can sell for a few thousand, and because they failed, have put Patrick's day over the eyes of all the prominent claims in the two districts; and then, again, we have a few old cranks who own some very good prospects, who are always on the sell, but when a genuine buyer comes along, they become suddenly wealthy and get very independent, and instead of selling for a good round sum, perhaps to a man who would do more in the camp in 30 days than they themselves would in 30 years, they want to hold or buy up the whole country, railroad included. Such are our drawbacks, and until parties come in the country who have sufficient nerve to go to work and put up a 10 or 20-stamp custom mill, the place will be a drag, for we have not enough high-grade ore that will bear shipping to keep the camp lively. The owners of most of the best claims are poor men, too poor to reduce their ores themselves, hence the necessity of a good square custom gold and silver mill. There is an abundance of ore in the two districts (Ohio and Mt. Baldy) to work within a few miles of a mill, but the owners of these claims can't go to work and pile the ore out on the dumps, for the reason that they are not able to get supplies, and unless they actually know that they can sell their ore when they do get it out, they must let it remain in the ledge.

The Sonora mine alone, would keep a 10-stamp mill running on $30 rock, then add to that the Great Western, the Bully Boy and Webster mines, the Fillmore and Occident, besides a dozen undeveloped claims with plenty of milling ore on the surface, what risk would there be in building a 10 or 20-stamp mill? It ought to be a good investment. The fact of a few men incorporating and selling the stock of some ground on Ten Mile creek should not discourage men from investing a few dollars in Bullion and Cottonwood canyons, where so much reality exists, and is actually in sight.

Two Ways of Skinning a Cat.—A correspondent of the New York *Mining Record* says the difference between the California and Colorado methods is about as follows: They both will result in the same end. The Californian will buy a mine with his own money, thoroughly equip it with good machinery, work it systematically, pay dividends for awhile if he has the ore, and if he has not he will buy it to pay dividends with. He soon runs the stock up to a good figure and then unloads. He will, in order to sell his stock, sacrifice his wife's relations—even to his mother-in-law. When he wants the stock back he will assess it till he freezes his friends out, and then play the old game again. Now we of Colorado do a little differently. We find a mine or claim, and instead of doing like the ignorant Californian (put our own money in), we get our wives' relations to put up. We then spend from $1,000 to $2,000 for a five-horse-power engine to put on the claim. We employ a general or a professor (by brevet) who has had generally six months' experience, and put him in charge to develop the mine. In a short time he has the mine in a good condition. His underground work resembles the wanderings of a blind gopher in a clover patch. We then subsidize one or two papers to puff the general, not the mine, so we can sacrifice our relations by selling stock that is not likely to pay dividends for the next century. Our ways differ slightly, but end in disgusting those who would otherwise invest in mines.

Reduction Works of Arizona—Locality and Capacity.—Arizona has 55 stamp mills of from 4 to 80 stamps each, aggregating 585 stamps. Of the entire number only one mill is run by water power. Cochise county has 9 mills, aggregating 115 stamps; Gila county, 12 mills, 79 stamps; Maricopa county, 3 mills, 95 stamps; Mohave county, 7 mills, 60 stamps; Pima county, 5 mills, 52 stamps; Pinal county, 4 mills, 37 stamps; Yavapia county, 15 mills, 127 stamps. The Vulture, Maricopa county, heads the list with 80 stamps.

Quick Cement for Glass.—The *Polytech. Notizblatt* gives the following receipt for glass cement: One part liquefied amber and 1½ parts sulphide of carbon. Apply this to the broken edges of the glass with a brush; press, and it will dry at once.

Bad for Copper Interests of Globe.

The following items about the shutting down of the Carrie company's smelting furnaces we take from the Arizona *Silver Belt:*

The Carrie company's smelter was shut down on the 20th inst. Mrs. Geo. Scott had put an attachment on the property a few days before, which was removed by the payment of her claim. In the last difficulty, the Tucson firm of L. Zeckendorf & Co. are the movers. Their claim is for some $21,000. The 74,000 lbs. of copper shipped last week went to their house, and the company are not credited with it in the account rendered. When the settlement occurs this will no doubt be done; and as the copper is probably worth 10 cents a lb., it reduces the indebtedness to $13,600. There are about five tons of copper since shipped, which reduces it still more. We understand that all local indebtedness has been paid; if so, the whole claim against the property cannot be more than $12,500. To offset that debt there is an excellent plant, a good mill site, three mines (the Carrie, the True Blue and an extension of the Orion), the first two of which have been producing the ore upon which the smelter was running. We have been informed that the condition of the True Blue is particularly good at present, as there is considerable ore in sight, and easily got at. There is no reason why this property should be idle, and we are satisfied it will not be long. We cannot blame Zeckendorf & Co.—they have a right to secure themselves; but we regret the occurrence, as it may operate adversely to the copper interests of Globe.

The Carrie copper company's non-success is simply another illustration of what we have so often condemned—the folly of sending men to run a business who are not experienced. Those Eastern men would not send a banker's clerk to plaster a house, but they acted just as foolishly in sending untrained men to run mines, or smelters or mills. The experience they acquire costs them dearly, but they do not profit by it.

Cochise District.

The Tombstone *Epitaph* says: From a gentleman who recently visited this section we learn the following: The Russell Gold & Silver Mining Co. own the Peabody, Copper King, Highland Mary, Donna Anna and Tam O'Shanter, the first two of which have received considerable development—but mainly the Peabody. While this can hardly be called a mine as yet, it is a most flattering prospect, and there is little room for doubt that the company will be able to keep their 30-ton smelter in constant operation when it shall have been set up. Besides a few shallow prospect shafts, all showing fine copper ore, there is an incline shaft of 97 ft, having an actual depth from surfaces of about 70 ft. Thirty ft down the shaft an elbow drift of 57 ft has been run in copper ore. This connects with an air shaft. At the bottom of the shaft a 30-ft drift has been run on the ledge which shows 6 ft. wide. There are about 400 tons of ore on the dump, that from samples run 36% copper and 26 ounces of silver to the ton, though a great deal is of high-grade, both in copper and silver. On the 17th, water was struck in a well at Cottonwood, three miles from the Peabody mine, in sufficient quantity to guarantee the erection of the smelter at that point. The smelter is from Rankin, Brayton & Co. (Pacific Iron Works), is of 30-ton capacity and is now at Summit station. It is expected to be in position in from five to six weeks. Four miles to the northwest a rich strike has been made in the Accident prospect, showing a good deal of high-grade petanka. This spur of the Dragoons is alive with black and white-tailed deer and bear.

Nitre.—It is reported that considerable beds of what is supposed to be saltpetre have been found near some small lakes in the neighborhood of Ragtown, seven miles below Fort Churchill. For many years these lakes have been famous for their deposits of soda, which mineral is there dug up in great purity, large cakes of it resembling ice. At one time parties in this city bored a well in the solid rock near one of these lakes to the depth of about 150 ft. in search of petroleum. After boring to this depth at considerable expense it was thought that it would be well to make a critical examination of the indications. What first induced the company to begin boring was a scum of an oily substance found floating on the water at the edge of the lake. A new examination was made, and it was found that the oily matter was merely a substance exuded by a sort of worm or grub living in the waters of the lake. So says the Virginia *Enterprise.*

The Atrato Mining Co., formed to pump up golden mud from the bottom of certain rivers in Central America, have let go to take a better hold. They have stored their mud-pumping machinery, and now announce that they will hereafter be a hydraulic and quartz mining company. Several "golden mud" pumping companies now being formed in the East can take warning by this company's experience, which ignored the experience in the same line already gone through in California. Pumping up gold from the bottom of rivers can be done well on paper, but not in any other way.

Important Ruling on Conflicting Claims.

The following letter explains itself:

General Land Office,
Washington, D. C., Oct. 8, 1881.

Register and Receiver, Salt Lake City, Utah:

Gentlemen: On the 7th of May last, the Rebellion Mining Co. presented at your office two applications for patent, one being from the Rebellion lode, designated as lot No. 193, and the other for the Mulcahy lode, lot No. 194, which applications were rejected by the Register, for the reason that a portion of the land embraced in each application conflicts with claims previously applied for, to wit: The Rebellion Lode conflicts with the Bibleback, lot 177, the Samuel, lot 178, and the Fallon, lot 179; while the Mulcahy conflicts with the Samuel and Fallon claims, for all of which applications for patent are now pending in your office, and to which the Rebellion Mining Co. duly filed adverse claims for the area in conflict, thereafter in due time instituting suits in court to determine the right of possession.

From the Register's action in rejecting the Rebellion company's applications, an appeal has been taken to this office. Inasmuch as the decision is in accordance with the previous rulings of this office (Huggins vs. Chavanne) and a correct construction of the law, no error was committed.

In the case cited it was held that "the rule which forbids the reception of an application for patent to a mining claim which conflicts with a claim embraced in a prior pending application is derived from that provision of the statute which prescribes the mode of filing adverse claims. Where the statute prescribes one way no thing shall be done it precludes every other. Chavanne having made application for patent to the Elk mining claim, Huggins as owner of a conflicting claim, had but one method open to him to protect his interest and have his right determined."

It is easy, it would seem, to see that this rule is a salutary one, for were it otherwise application after application might be accumulated in the local offices all relating to the same land, thus nullifying the law which requires adverse claims to be filed and prosecuted.

From the argument of counsel I understand that the Rebellion company simply desires these proceedings for patent to progress so far that it may, in the event of judgment in its favor by the courts in the controversies pending against the Bibleback, Samuel and Fallon, claimants, enter its claims entire.

The proper method to accomplish this end is by excluding from its applications the area in conflict with the claims previously applied for, as shown by the accompanying claims.

It is urged, however, that should this be done, it would amount to an abandonment of all the ground in conflict. This is clearly a mistaken conclusion. Such an exclusion is not relinquishment. The company's right to the land in conflict has been asserted by the filing of adverse claims, which relate only to the land in conflict, and this was the only way by which it could assert title to such portions of its claims. The proposed applications will amount to an assertion of the right to the remaining portions. Now the plats of surveys and field notes properly describe and show the entire claims, also correctly representing the areas of conflict. It would be a somewhat difficult matter to prepare for publication and posting, notices which shall describe only those portions of the claims not in conflict, than requiring no words of exclusion, without having prepared amended surveys. In order to avoid the trouble and expense incident to such amendment it is regarded sufficient for executive purposes if words of exclusion be used in the application and notices which effect only the present proceeding; but patents could not issue for the portions so applied for separately from the portions in controversy without amended surveys.

The company must amend its applications so as to exclude the conflicting areas therefrom, which exclusion must also be recited in the published and posted notices, and I see no objection to adding thereto one express declaration that it thereby relinquishes no right or title to the areas so excluded, although I deem such declaration wholly unnecessary.

Should it appear, upon proper proceedings being had, that the company is entitled to the land as applied for, and the courts adjudge it to be the amount of the areas in conflict, it may make entry of each lot as if applied for entry.

Very Respectfully, N. C. McFarland,
Commissioner.

Large Cast Iron Wheels.—Three fly-wheels have been lately cast at Mr. Lycett's foundry, Wolverhampton, Eng., each wheel weighing 40 tons in the rim, and cast in one piece. The diameter is 26 ft.; depth, 23 inches, and measure across the face, 15 inches. Each rim will have eight arms affixed, which will weigh about 25 tons, making the total weight of each wheel 65 tons. Fly-wheels weighing 65 tons have been cast in that district before, and some of them with a diameter of 30 ft., but it is believed that they have all been cast in either two or more segments.

A Prediction Verified.—Several years ago Ericsson predicted that the Nile and the Gangee would be lined with cotton and other factories driven by solar heat. A French engineer in Algiers is already contributing to the fulfillment of this prediction by pumping water and making it boil by solar force alone.

How to be Dismissed.

R. R. Bigelow, of Elko, Nev., writes to the General Land Office that some years ago the owners of a certain mining claim procured a survey thereof and filed an application for patent, but proceeded no further than publication of notice; that since that time the claim has been relocated as abandoned property, and that the present owner is desirious of obtaining a patent, but no survey thereof can be had, as the application of the former owners is still upon the records of the local land office, and he now seeks to learn as to the manner in which a dismissal of the application can be secured in order that a new survey may be made upon which to base an application for patent by the present owners. The Commissioner replies "that a party desiring to file an application under the circumstances stated should transmit to this office his affidavit, and that of one or more disinterested persons, reciting the facts in the case, giving the date of the original location, the time when work upon the claim was suspended by the former owners, date of relocation by the present owners, and such other material facts as will establish a *prima facie* case of abandonment.

If such a case be established by said affidavit, the register and receiver of the proper land office will be instructed to order a hearing in the matter, giving notice to all parties concerned; and if the result of such hearing be to sustain the allegations of the claimant, the application of the former claimant will be dismissed and the premises restored to the public domain, subject to entry and patent by the relocator upon complying with the provisions of law.

New Smelter.—The following item about a furnace in Globe district, Arizona, we take from the *Silver Belt:* "Gen. MacDonell, of the Buffalo mining company, has a large force of men employed, and would soon be in a position to ship copper if he could get his machinery in. The form of smelter he has erected looks somewhat primitive beside the more pretentious water jacket, but it is said to be very effective. It is simply a large perpendicular square flue, built of well-dressed stone, and 30 ft. high. Five ft. from the top the feed opening is placed, and from there to the bed of the furnace it is 15 ft. It has a capacity of 15 tons daily. It has stout copper plates set in the masonry where the heat will be most intense. It will be firmly secured from damage from expansion by stout iron clamps. The slag and metal discharge openings will be in the front. The low position of the smelter gives little show for a slag dump, but that will be obviated by the erection of a derrick with a 30-ft. arm, which will lift the slag pots and swing them 60 ft. from the furnace. The cost of the furnace will not exceed $700. This is the same form of smelter that is used at Clifton, A. T. A smaller one, of the same pattern, was used by Ignacio Campbell at the Wheatfields with success."

Strontium.—On a late visit to Mazourka canyon, Mr. Woodhull, of the assay office, found a mineral that on investigation proved to be a sulphate of strontium. It is of a bluish white color and looks much like marble, but has a much higher specific gravity. In mineralogy the mineral is called celestite. The metal, strontium, is of a pale yellow color, and is but little used in the arts. The nitrate of strontium is used in the manufacture of fireworks, and it imparts to flame a beautiful crimson color. A process recently introduced in German beet-sugar manufactories, has created a demand for strontianite, and it is reported that mining for it is going on quite extensively in Westphalia, Germany, notably at Dasheck and Denstreinfort, near Munster. About 4,000 to 5,000 cwts. are now gathered, and there has been some excitement among peasants, who, ignorant of the value of the mineral, were led into unfavorable concessions of mineral rights by outside speculators. Possibly it might prove worth the while of some of the prospectors in this country to inquire into the possibility of supplying the German markets.—*Inyo Independent.*

Sawtooth Mines.—In our last we omitted to name one peculiarity of this great mine, the Pilgrim. It has a clay or putty-like seam running near the center of the vein from the inner end of the tunnel for hundreds of feet toward the mouth. In the foot wall half of the lode, the rock is hard; and the other half the entire space seems to be filled with decomposed ore. We never saw any other mine with these characteristics, and yet, it seems to be elementary with this one, rising above and continuing below the tunnel, which is a large, fine one, being cut sufficiently spacious and well constructed for working the mine to advantage.—*Challis Messenger.*

A Good deal of prospecting is still being done at the old Meadow Lake diggings, and it is now reported that a ledge containing rich ore, that is free milling, has been found. Most of the ledges were free milling at and near the surface, as many old Comstockers remember to their sorrow.

The Savage company are now taking out about 50 tons of ore per day from the Sutro tunnel and Potosi tunnel levels. They are drifting in on the 1100 level, and will shortly begin prospecting a block of virgin ground reaching from that point up to the 400 (or Potosi tunnel) level.

MECHANICAL PROGRESS.

Tests of Constructive Material.

One of the most interesting exhibits, both to the engineer and mechanic, as well as to the general visitor, at the fair of the Massachusetts Charitable Mechanic Association now in progress at Boston, is that sent from the Watertown Arsenal. The exhibit consists of materials which illustrate the results of tests made by engineers in the service of the government upon a machine specially constructed for the purpose. The arrangement of the exhibit is such that each article tells its own story, while those persons who are sufficiently interested to desire the particulars may learn them from a pamphlet near at hand. The exhibit consists of three groups of objects, which have been ruined respectively by tensile strains, bursting strains and compression.

One of the objects most likely to attract popular attention is a steel-wire cable of the kind being employed in the East River bridge. The diameter of this cable is 1¾ in., and the strain to which it was submitted was 150,000 lbs., or 75 tons. The cable itself remained intact with this severe test, but the bail of the socket parted, which shows, like many others of the Watertown experiments, that in constructions of this class the weakest point frequently lies, not in the cable itself, but in its fastenings or fittings.

A hammered-iron bar 5 in. in diameter was broken by a tensile strain of nearly 723,000 lbs., or 36,900 lbs. per sq. in. Under this tension the bar parted *with a loud report*. The fracture shows a crystalline structure. A smaller wrought-iron bar was broken asunder by a tensile force of 51,340 lbs. per sq. in. This bar drew down at the place of fracture, and shows a fibrous structure at the break.

In the group which contains specimens destroyed by compression, two iron columns of different forms give some idea of the relative value of the shapes shown in supporting great weights. A latticed iron column some 10 ft. long, of a pattern quite familiar to all who are acquainted with bridge work, was ruined by a pressure of 574,500 lbs. A circular flanged column, known as the "Phœnix" pattern, and of much smaller size and weight, sustained nearly 50,000 lbs. more than the weight above given. Tests of this kind have determined definitely the value of the latter form, but its liability to deterioration from oxidation upon the inside detracts somewhat from its value in practical use. An 8-inch column of the "Phœnix" pattern which had been subjected to a test for compression, shows, by the perfect symmetry of its present crushed form, how perfectly it is adapted for supporting weights.

A much-needed lesson to builders is splendidly illustrated by pine columns, which have in some instances supported remarkable pressure. The first of these columns, originally 12 ft. long, yielded to a pressure of 190,000 lbs., the weak spot being a large knot which acted as a wedge and caused the destruction at less than the proper figures. Another of these columns is a stick 12 ft. in length, tapering from about 7¾ in. to nearly 6¼ in. in diameter. This stick, being practically perfect, has shown its weakest point to be at the smaller end, for it is at that point that the crumbling of the fibres has taken place. As an argument against the prevalent custom of turning down wooden columns at the end this test stands unquestioned.

A seasoned herd-pine girder 11 in. square and 10 ft. long, when tested, bore the astonishing load of 751,000 lbs.—a conclusive proof of the value of such timber for columns.

As an example of bursting strain, a model one-third size of the breech of a 10-inch cannon is shown in the center of the section. This cannon was partly filled with beeswax, and a close-fitting steel plug was forced into the aperture. Under a pressure of 599,000 lbs. the model, being a stout casting 2 ft. long by 11 in. outside diameter, was fractured in every direction.

Several other interesting tests of steel bars, cast bars, boiler plates, etc., complete this display. It is a graphic method of showing facts that are of interest to every thinking man. It is a popular presentment of facts frequently published in technical journals, but not easily accessible to the average reader.

IRON AND STEEL ROLLING.—An interesting experiment was recently made at a rolling mill in Germany, to ascertain the relative proportions of power required to roll an ingot of iron and an ingot of steel, each of similar weight. The pile of iron was passed through the rolls under a steam pressure of 57 lbs., and was brought to its desired form, without any material diminution of speed, so that the rolls were at once ready to receive the next charge. The steam pressure was then allowed to increase from 57 lbs. to 71 lbs., and the initial velocity was also materially increased at the moment of placing the steel ingot in the rolls. After the steel ingot had been brought to the same form as the previous one of iron, the speed and pressure was so much reduced that had another ingot been put in at once, it would have stuck fast before the rolling could have been half completed. It required 40 revolutions of the engine to recover its initial speed. The increase of power for manipulating steel over that required for iron, is therefore very considerable—much more than is generally supposed.

HEATING METALLURGICAL FURNACES WITH COAL DUST.—An improved apparatus by which coal dust and other pulverized fuel can be efficiently and economically utilized for the heating of metallurgical and certain other furnaces, has been invented by Mr. G. M. Thompson, of Paris. The apparatus in question is composed of a hopper, through which the pulverized fuel falls upon a horizontal shaft provided with worms or screw blades working in opposite directions from the center, the said shaft being operated by any convenient motor. By these worms the fuel is carried into funnels beneath each end of the hopper, whence it falls into air pipes, in which, after being thoroughly mixed with atmospheric air, it is blown into a combustion chamber, where it is instantaneously ignited and entirely consumed. The amount of air required to effect perfect combustion is regulated by suitable registers, and the admission of the fuel is controlled by a pulley set on the worm shaft; the uniformity of the feed being secured by agitators set upon a longitudinal shaft, which, passing through the hopper from end to end, is rotated by suitable gearing. The form, dimensions and general details of construction of the apparatus may be varied according to its intended application.

LAGGING FOR STEAM PIPES.—A French mechanic of some experience, says a contemporary, recommends the following process for producing a lagging for steam pipes, which, besides being comparatively inexpensive, appears to be very effective: A long tube of some flexible material, such as canvas, is drawn over a metallic pipe of approximately the same diameter. Either of the ends of the canvas tube is bent over, so as to reach into the interior of the metal pipe, and is pulled through it, while at the same time quantities of cloth fibers are introduced, so as to completely fill it. After one length of the canvas tubing has been partly disposed of in this manner, another length may be drawn over the metal pipe, as before, one of its ends being connected with the piece almost drawn through. Having done this, the additional length may be drawn through, this process being carried on until a sufficient length of lagging has been obtained. Its cross section is round, as a matter of course, and may be altered by subjecting the lagging to the process of rolling.

HAULING FIRES.—When a boiler is short of water and a heavy fire is on the grate, what shall be done to prevent the boiler from being burned? The first impulse is, on the part of some, to haul the fire at once, but is not that the most dangerous course that could be taken? It seems open to criticism. A fire that is disturbed, is intensely hot for a short time, at a period when no more heat is needed, and it would therefore seem that it would be better to open the doors and throw wet ashes on to smother the fire, instead of adding to the danger by raking it over. By so doing, the heat is at once lessened—at no time increased—and the pressure is falling, but when we haul a fire, the exact reverse occurs, more steam is made and the danger increased. We think it is safer to cover the fires than to haul them, particularly if they are of bituminous coal.—*Mechanical Engineer.*

COMPOUND STEAM ENGINES.—Hallauer's recent experiments have led him to the conclusion that the difference between engines of one and two cylinders, in point of economy, is very slight. In ranging from 80 to 8,000 horse power, with revolutions varying from 25 to 90 per minute, the expenditure of steam for a given amount of work remains the same for the same type of motor; the consumption for two cylinder motors are identical for Woolf and compound, whatever may be the volumes of the cylinders, provided the motors are regulated so as to give the maximum efficiency; the expenditures of steam in motors of one, two and three cylinders, suitably regulated and constructed, are so nearly alike that the choice may be governed in each instance merely by the fitness of the type of the engine for the particular purpose desired.

CONNECTING WIRES.—Mr. Thomas Ellis, of Coatbridge, Scotland, proposes a new method of connecting metallic wires, the manner of proceeding being as follows: A piece of iron, similar in shape to an olive, is pierced at the ends to admit the insertion of the wires, two larger holes being situated near the middle, through which a pair of pincers may be passed to head back the extremities of the wires in such a way as to form a sort of ring. This fastening is, moreover, easily undone when required. Instead of bending the wire, a small nut may be applied to its extremity, or what is better still, the olive-shaped iron may be tapped in order to fasten the wire. The mode of connection is especially convenient for telegraph wires.

MOLDS FOR CASTING STEEL UNDER PRESSURE. Mr. C. J. Allport, of London, proposes to use asbestos for making the joints of molds for casting steel and other metals under pressure. The method of accomplishing it is to either use strips or rings of asbestos, millboard, or asbestos fiber made into a gasket between the bottom of the ingot mold and the bottom upon which it stands, and the lid and the top of the mold, and if the mold is made into more than one piece, between the joints of the different pieces.

GAS ENGINES.—The Otto gas engines on exhibition at the electrical exposition in Paris, vary in power from half-a-horse to 50-horse.

SCIENTIFIC PROGRESS.

The Moon and the Weather.

M. De Parville has published in the *Journal des Debats*, a paper on the temperature of the present year, which, at Paris, has risen to a height exceeding all previous authentic records. In the course of the article he raises the question as to whether the dryness of the present summer could have been foreseen, and answers it in the affirmative. Having then referred to the influence of solar action on the atmosphere, he says: "A very long series of observations has also shown that the moon, which passes every month from one hemisphere to the other, influences the direction of the great atmospheric currents. The changes in those currents, in consequence of the prevailing moisture or dryness, are intimately connected with the relative position for the time being of the sun and moon.

The distance of the moon from the equator, that is, the inclination of the moon's path to the plane of the equator—varies every year, passing from a maximum to a minimum limit; and the meteorological character of a series of years appears to be mainly dependent upon the change of inclination when these extreme limits have been touched. Observations prove that the rainy years, the cold winters and hot summers return periodically, and coincide with certain declinations of the moon. In our latitudes the rainy years occur when the moon's declination has touched its extreme limits of 28°, 26° or 18° respectively. They are separated from each other usually by periods of about three years, and then six years." M. de Parville then gives a list of rainy years running back to 1783, the most recent being 1879, 1876, 1866, 1859, 1856 and 1853, in each of which the moon's declination was either 28°, 26° or 18°, beginning with 26° in 1879 and running back in the order named. The severe winters, he says, coincide as a rule within a year of the same declinations. The dry summers come naturally in the middle of the period which divides two wet years. The next wet year ought to coincide with the declination of 18°, therefore, with the year 1884, as the last was 1879 with the declination of 26°. Between the two years comes the period of maximum dryness, and it may be expected, therefore, that the year 1882 will be another dry year.

The Influence of Telegraph Wires on Lightning.

Some interesting facts in the above connection have recently been brought out by M. Montigny through observations along a railroad telegraph line in Belgium. It appears that the wire for a considerable distance passes along extensive lines of poplar trees, while the road rises gradually from a plain to an elevation of about 200 ft. A close examination shows that along this route only about 1% of the trees have been struck by lightning on the plain, and on the slope about 25%, while upon the highest portion of the line not less than 64% of the trees show evident marks of injury from lightning.

M. Montigny distinguishes three kinds of injuries: First, the bark torn and detached on a limited part of the trunk; second, a furrow, straight or (rarely) spiral, made on the tree, from near the wire, down to the ground; third, a peculiar oval wound, with longer axis vertical and lips colored light brown. The furrows, which are probably due to the most violent discharges, are relatively most frequent on the upper and western slope, which the storms usually reach first. M. Montigny is of the opinion that the lightning, while provoked by the wire, does not strike that first and then the tree, but strikes the tree directly.

His conception of the process is to the following effect: Suppose a thunder cloud charged with positive electricity. A long telegraph wire under it, though insulated, may acquire as great negative tension in the nearest part as if in direct communication with the ground; and the tension is greater the nearer to the cloud. While the inductive influence affects the wire most, objects that are near, such as trees, share in the influence according to their conducting power. The lightning is attracted in the direction of the wire, yet does not strike it; the insulating caps present an obstacle to its prompt and rapid escape to the ground. It finds a better conductor in a neighboring tree wet with rain.

LIVING ANIMALS LIT UP FROM WITHIN.—At a recent soiree in the Paris Observatory, M. Trouve showed a live fish with its body lit up from within by his electric polyscope, a minute form of which, with conducting wires passing to the hands of the operator, the animal had been caused to swallow (comfortably, let us hope). The whole body became transparent in the dark, so that the vertebræ could be counted and all the details examined. This instrument promises to have many uses. Among others, it has already been applied, *La Nature* says, to showing students the texture of the rectum and bladder, to facilitate extraction of a projectile at the back of the nose, to examine the stomach of a bull (in which a gastric fistula was formed), to lighting the interior of shells and cannon for examination, also to lighting powder magazines, in which case the reflector is inclosed in a triple envelope of glass.

METEORIC ORGANISMS.—At the late meeting of the British Association for the Advancement of Science, held at York, during a discussion as to the lately mooted question of the discovery of vegetable fossils in a meteoric stone, Sir William Thomson observed that in all probability some of the vegetation existing was of meteoric ancestry. The stone in question was not on the earth a quarter of an hour before it was picked up, and it was certain that it came from outside the earth. He also said there was a general consensus of sentimental belief that in many other bodies in the universe there was something like the life on this earth, but that was not a scientific belief; however, science was in what might be called a skeptical condition. Life elsewhere was a possibility, and science only went the length of saying that life elsewhere was not impossible. At the same time he did not say that the sentimental belief might not be as well founded as any scientific belief, but all he could say at present was that such a belief was not founded on scientific grounds.

SCULPTURING WITH STONE IMPLEMENTS.—It has been held by some archæologists that the ancient sculpturings could not have been cut without the use of iron tools; but others have of late years succeeded in reproducing similar markings on granite slabs, using solely stone implements; and in doing so they found that diorite and other such tough stones cut the granite better than flint. This corresponds with the practice of the stonecutters of the present time, whose steel tools for cutting granite are of a much softer temper than those they use for sandstone. The great sculptured stone of Montezuma, in Mexico, is a striking proof of the extent to which granite can be sculptured with stone implements. Gama, in his work describing this stone, states that 10,000 Indians were employed in transporting it to the City of Mexico, where it was sculptured by 30 workmen with stone axes.

MAGNETIC PROPERTIES OF NICKEL AND COBALT.—M. A. Gaiffe, says the *Electrician*, has made some fresh experiments on the magnetic properties of nickel and cobalt, the specimens being obtained by an electro-chemical process, the currents employed being of sufficient intensity to render the metals very hard. Having divided them into bars of nearly equal dimensions, some of them were left in the hard state, others were annealed, and others again were annealed and forged. All of them were magnetized at the same time and in the same way, and measured by means of a magnetometer. After being left for 36 and 72 hours, they were again measured. He found that their magnetic properties increase, and concludes that this is owing to the presence, when first taken out of the bath, of hydrogen in combination with the metal, which paralyzes the magnetic power.

LUMINOUS METEORS.—At the recent session of the British Association, at York, Prof. A. S. Herschel read the report of the committee on luminous meteors, in the course of which he referred to the aerolite which fell near Middlesborough this year, and embedded itself to a considerable depth in the earth. It was estimated that it struck the earth with a velocity of 402 ft. per second. There was no doubt it fell at least 40 miles. Sir William Thomson said the great majority of meteoric stones, instead of falling to the earth in a solid mass like the one produced, generally got shivered to pieces in the air through becoming so intensely hot. Prof. Herschel observed that the stone in question had not been exposed to any great heat

NEW MODE OF TELEGRAPHING.—*Nature* reports that a telegraphing experiment of a singular description was tried about the middle of August at the Trocadero. It consists merely in the reading of large silvered zinc letters, a square meter in size, fixed on a blackened board, by refracting telescopes. This method has succeeded very well from the Trocadero to the Pantheon—a distance of three miles. The inventor, an officer in the French service, thinks he will succeed in reading messages at a distance of 60 miles under favorable circumstances.

A NEW METAL.—A vein of what is supposed to be a new metal, is said to have been found in digging a well near Battle creek, Mich. The find is in a stratum of rock about 28 ft. below the surface. Pieces of some of the nuggets taken out, it is said, have been melted up, and have all the appearance of the best gold, but when the acid test is applied to the metal it corrodes, showing that it is not the genuine precious metal. It is not known what metal it is, and specimens have been sent away for analysis.

A NEW USE FOR ELECTRICITY.—Electricity is now employed in the rectification of inferior alcohol. This work is accomplished by passing a current, generated by a voltaic battery and a dynamo-electric machine, through it. By this operation the superfluous hydrogen is disengaged, and beet-root alcohol, which is usually very poor, can be made to yield 80% of spirits, equal to that obtained from the best malt.

LONG TELEPHONE CIRCUIT.—The telephone has been successfully worked over a distance of 350 miles between Buffalo and Pattersoa in New York and New Jersey States. The voice could be recognized, but owing to the sputtering and snapping caused by induction (the wires were close to the ordinary lines), the words could not be distinguished.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Oct. 13.		Week Ending Oct. 20.		Week Ending Oct. 27.		Week Ending Nov. 3.	
Alpha	3¼	3⅛	3.80	3⅛	4.40	3.90	4	3⅜
Alta	4.90	4.55	4.55	4.35	4.40	3.95	4.35	4
Andes	1⅞	1.70	1⅞	1.60	1.65	1.65	1.60	1.45
Albion	2½	2	2.40	2⅛	2.30	2.05	2⅛	2
Argenta	....	....	5c	....	5c	....	10c	....
Addenda	15c	10c	10c	....	10c	....	10c	5c
Belcher	2.05	1.90	2	1.90	2.10	1⅞	2.55	2.80
Belmont	....	....	....	....	40c	....	60c	65c
Best & Belcher	13⅜	12⅛	13	12⅜	12⅛	11⅜	12⅛	11⅜
Bullion	65c	65c	75c	65c	1.90	65c	1.95	1.70
Bechtel	75c	70c	75c	70c	76c	50c	55c	50c
Belle Isle	....	....	....	....	....	....	....	....
Bodie	8⅛	....	8	....	7⅞	7⅜	7	6⅛
Benton	90c	80c	80c	75c	70c	65c	75c	65c
Bulwer	....	....	....	....	....	....	2.20	2
Boston	6c	....	25c	5c	....	....	....	....
Black Hawk	5c	....	5c	....	....	....	....	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	10c	....	10c	5c	25c	15c	45c	15c
California	1	90c	95c	90c	90c	70c	80c	75c
Challenge	70c	....	....	....	....	....	70c	....
Chollar	2⅛	2.30	2.65	2.45	2.40	2.05	2⅛	2
Confidence	3⅝	3	3.45	3⅛	3	3.65	3.35	
Con Imperial	20c	15c	25c	20c	25c	20c	20c	....
Con Virginia	2.55	2.35	2.55	2.45	2.45	2⅛	2.40	2⅛
Crown Point	1.85	1.70	1.85	1⅞	2.05	1.90	2⅛	1.85
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1	....	1⅛	1	....	....	1⅛	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	40c	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2⅛	....	2.40	....	2⅛	2.20	2.30	2
E. Mt. Diablo	20c	....	20c	....	20c	15c	40c	30c
Eureka Con	22½	20c	21⅛	18	16	15	18	16½
Exchequer	1⅛	90c	1⅛	1.20	1⅛	1.35	1⅛	1.35
Endowment	....	....	....	....	....	....	....	....
Grand Prize	15c	10c	5c	....	5c	....	....	....
Golden Gate	2.60	....	2⅛	....	....	....	....	....
Goodshaw	35c	....	25c	....	35c	30c	35c	30c
Gould & Curry	8⅛	7⅞	7⅞	7⅜	7⅜	6⅞	7⅛	6⅛
Hale & Norcross	3⅛	3.05	3.40	3.15	3.20	3	3.10	2.95
Head Center	....	....	....	....	....	....	30c	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	15c	10c	10c	....	....	....
Julia	15c	10c	40c	10c	45c	40c	45c	40c
Justice	75c	65c	1⅛	90c	95c	90c	1	95c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2⅛	....	2⅜	....	2⅛	....	2⅛	....
Knsauth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	20c	15c	....	....	20c	15c	15c	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	1⅛	....	1
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	1⅛	....
Martin White	2⅛	1⅞	2.10	2.05	3.30	2.35	....	....
McClinton	....	....	....	....	....	....	....	....
Meno	2.60	2⅛	2.35	2⅛	2.20	1⅞	1⅛	1⅛
Mexican	9⅜	8⅞	9⅝	9⅛	9⅛	8	8⅝	8
Mt. Diablo	6	5⅜	5	....	5⅛	5	7⅛	6⅛
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	10c	5c	20c	6c	5c	....	....	....
Noonday	60c	50c	50c	30c	55c	25c	50c	40c
New York	10c	5c	10c	5c	15c	1c	10c	....
Northern Belle	12⅜	11⅜	11⅞	11⅛	12	11⅛	12⅜	11⅛
North Noonday	40c	30c	35c	....	5c	....	25c	20c
Navajo	60c	....	50c	....	45c	....	40c	....
Occidental	1⅛	1.40	1.40	1⅛	1⅛	1.30	1⅛	1⅛
Ophir	7⅛	6⅞	7⅛	6⅛	6⅞	5⅞	7⅛	5⅛
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.65	1.45	1.80	1.45	2.65	1.95	2.60	2.30
Oro	70c	60c	60c	40c	40c	30c	35c	30c
Paris	....	....	....	....	....	....	....	....
Potosi	3	2.80	3.10	2.85	2.90	2⅛	2.70	2.45
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	4.05	3.40	4⅛	4.10	3.90	3.70	4	3.45
Seg Belcher	7⅞	7⅜	7⅞	7	9	8	8⅜	....
Sierra Nevada	16⅛	14⅛	16⅛	15	15⅜	14⅞	14	....
Silver Hill	30c	25c	30c	25c	20c	25c	30c	25c
Silver King	18⅛	18⅛	19	17⅛	19⅛	18⅜	20	19⅛
Succor	....	....	....	....	....	....	....	....
Summit	....	....	20c	....	10c	....	....	....
Scorpion	1.80	1.65	1⅞	1.70	1.65	1.45	1.60	1⅜
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	40c	....	40c	....	....	....	....	....
Tioga Con	50c	35c	30c	20c	20c	....	25c	20c
Tiptop	6	5⅜	5⅞	....	5⅞	....	5⅜	5⅛
Tuscarora	20c	15c	15c	....	15c	....	....	....
Union Con	14⅛	13⅜	15	13⅞	14	13⅞	14⅛	13⅜
Utah	8⅛	7⅞	7⅞	7⅛	7	6⅞	7⅛	6⅛
Ward	2⅛	....	....	....	3	2⅛	3	....
Wales	75c	....	50c	....	40c	....	50c	....
Yellow Jacket	4.30	4.15	4.40	4.30	4.35	3⅞	4.35	3.80

Sales at S. F. Stock Exchange.

Thursday A. M., Nov. 3.

50	Alpha	200	Trojan
100	Alta	100	Union
100	Andes	20	Utah
65	B & Belcher	35	Ward
150	Belcher	273	Yellow Jacket
200	Bullion		AFTERNOON SESSION.
350	Benton	50	Argenta
430	California	125	Albion
170	Con Virginia	50	Addenda
80	Chollar	600	Belmont
100	Crown Point	100	Belcher
100	Con Imperial	100	Bechtel
60	Confidence	90	Bodie
125	Caledonia	50	C Pacific
385	Exchequer	50	Day
140	Gould & Curry	385	E Mt. Diablo
365	Hale & Nor	100	Eureka Con
115	Justice	90	Mt Diablo
110	Mexican	50	M White
200	New Wells Fargo	50	Mono
100	Ophir	700	N Noonday
900	Overman	50	N Belle Is
1025	Potosi	250	Northern Belle
950	Savage	800	Orn
270	Sierra Nevada	100	Star
90	Scorpion	200	S Bulwer
		100	Tioga Con

5c	
13⅜	
7	
3.55	
10c	
2.55	
2.60	
65c	
1.95	
55c	
4.05	
2.80	
10c	
2.60	
5c	
60c	
25c	
60c	
6⅞	
1.95	
35c	
2⅛	
6⅜	
3.10	
1⅛	
20c	
25c	
30c	
25c	
20	
19⅛	
1⅜	
20c	
5⅛	
14⅜	
13⅞	
6⅛	
7⅛	
3	
50c	
2.70	
3.45	
8⅜	
14

so universally confident of a brilliant and permanently prosperous future.

INYO.

No Sale as Yet.—Inyo *Independent*, Oct. 29: Notwithstanding the efforts of several mining men representing capital, there is no sale of the Keynot gold mine to be reported yet. Word comes pretty straight that Peter Taylor, backed by a San Francisco company, will soon be on hand with plenty of cash capital to capture the whole works. Uncle Peter is entitled to immense credit, for having practically brought out the district, and we sincerely hope he and his company will get the mines.

Virginia Con.—Mr. Chenot, superintendent of the Virginia Con. mines, on Kearsarge peak, has just put on a small working force of miners. We understand that operations will be confined to searching out and opening outcroppings on the line of the Virginia ledge, which is judged by those best informed to be one of the very best on the mountain. Some very rich gold and silver ores from the mines were worked at the Pioneer mills in early days.

Poleta.—We hear that several miners have been discharged, owing to the impossibility of working advantageously to any greater depth without hoisting machinery. It is said that works are to be put on the mine right away.

Panamint.—Supt. Pheby arrived at Darwin last Saturday, en route to Panamint. It is said that he will immediately put on a large force, in mining and rebuilding the road.

Keyot Bullion.—As near as can be learned, some $13,000 in gold has been shipped to Lone Pine from the Taylor mill during the month.

MONO.

Bodie.—*Free Press*, Nov. 1: Probably all the mines now running will be kept in operation during the coming winter, and not impossibly others may, after the deep shafts have drained down somewhat deeper, take up their work where it was left off months ago in consequence of too much water. The Standard shaft is now down 1,090 ft, the Lent 775, and the Red Cloud 640. The Lent reports most of its water from the 700 and 740 levels, and not from the bottom. The Red Cloud has far less to contend with in this regard than formerly, and there seems a reasonable probability that as still greater depth is attained, the obstacles which this element has presented may disappear altogether. The completion of the Mono Lake railroad will render it possible to obtain supplies of wood and lumber in the winter time without greatly increased cost or inconvenience. The Standard-Bulwer mill has been undergoing a thorough overhauling the past week, the first for a year and a half. The Noonday mill, of 40 stamps, has completed its contract with the Bechtel, and has resumed crushing ore from the Noonday and North Noonday mines. The contract of the Oro Co. with the Silver Hill has also expired. The Tioga, Blackhawk, Champion, Goodshaw, Addenda, and others of our mines, are prosecuting their explorations steadily. The Bodie Tunnel mill it is anticipated will be completed by the 1st of December.

Bodie Con.—There were 122,465 tons of ore hauled to the mill during the week ending October 29th, and 117,472 tons were crushed, yielding $9,977.95, or an average yield of $50.40 per ton. The average assay value of the pulp was $64.43 per ton; that of the tailings $11.52, so that the average value of the ore worked was $70.02 per ton. The amount of ore extracted during the week was 100,402 tons, as follows: 43,812 tons from the 5th level stopes, and 56,590 tons from the 0th level stopes and winzes.

Standard Con.—During the week ending October 29th there were shipped to the mills 495 tons of ore from the 300, 385, 500 and 550 levels. Average pulp assay for the week was $60.60; crude bullion received, 4,000 ozs, and the amount shipped to the company, $21,207.79. The shaft is down 1,090 ft.

Bodie Tunnel.—There has been a decided improvement in the mine during the past week, the ore in the upraise of No. 7 being of a high grade, 2 ft wide. Ledge No. 20 in the stopes north shows 5 ft of ore between the walls.

NEVADA.

The Peabody Mine.—Footbill *Tidings*, Oct. 29: This afternoon the Peabody Co. turned water on their wheel, and all the machinery moved as smoothly as master mechanics could make it. The wheel, an over-shot one, is 36 ft in diameter, which gives power to sink the sheft 500 ft. The bolsting works are 30 ft high by 30 long, and are sufficient for all immediate demands. Water from the Y flume will be used to run the wheel, and it is estimated that it will require about 90 inches, miner's measure, to run it. The mine will be pushed steadily forword with the reasonable hope of soon putting it on a paying basis. The shaft at present is 184 ft deep, on an incline. Tomorrow morning a force of 10 men will be employed to commence sinking on the ledge in the bottom of the shaft. The ledge is now 2 ft. thick, is in a slate formation, and shows well in mineral. There are 3 ledges in the shaft, and it is probable that one of them will be followed, as the indications are that there is a rich pay chute not far distant.

Getting Ready for Work.—*Transcript*, Oct. 30: Geo. T. Emery, who recently purchased the river claims of the South Yuba mining tunnel company at Hoyts crossing, Bridgeport township, is making preparations to immediately begin opening up the property. We understand that for the present he will put only 15 men at work, 13 of them to be Chinese. In the course of a few weeks he expects to increase the force to 50, or perhaps 75, and it is said these employees will also be principally Chinese. This is not a hydraulic claim, neither is it owned by foreigners, unless San Franciscans are included under that head.

General Grant Mine.—Work on the General Grant gravel location at Town Talk is progressing satisfactorily. A contract of 75 ft was finished Saturday by Thos. Bennetts, making this tunnel 500 ft long. The contract for extending it 50 ft farther was immediately let to the same party. It is believed gravel will be struck within 150 ft more. The owners of the ground are J. J. Ott, Phil. Richards and Wm. Richards of this city, and Mr. Bennetts of Gold Flat. They have already been at work there nearly 3 years, and so far have not got a color. Their tunnel runs into the ridge from the north side, and Tremaine & Co. are pushing for the same channel from Suttoa's ranch on the south side. The lead hes already been developed on Gold Flat, at the claim owned by Jas. Kitts. During a mouth's run recently, while water could be obtained, the gravel paid $3 a day to the man.

Rich Gravel.—Nevada *Herald*, Oct. 30: Thursday afternoon Louis Seibert, who lives on Deer creek just below town, while engaged in moving a large bowlder from a piece of land, discovered beneath it quite a deposit of gravel. Some years ago Scibert had mined on the ground, and it had paid well, so he concluded to prospect the gravel. From 4 pans of it he obtained over $2. The deposit is not very large, and Seibert says he intends to pan it all out.

The Eagle Mine.—Nevada *Herald*, Oct. 29: It is expected that by the 5th of next month a crushing will be had of 30 tons of rock from the Eagle mine, situated near Pine Grove cemetery. The rock that is now being taken from the mine is very rich, and from the prospects obtained it is believed it will yield as high as $75 to the ton. The ledge is 8 inches wide, and everything indicates that the chute is about 200 ft long. At present the mine is being worked by parties who have leased it on conditions. Mr. Wm. H. Smith, of this city, who is the owner, has no present intention of disposing of the property, but says he finds this system of prospecting less expensive than the manner in which he has previously worked the mine.

SIERRA.

Brush Creek.—We had the pleasure this week of a visit with R. Gillis, Esq., superintendent of the Brush Creek quartz mine, at the Mountain house. He said 3 months will be required for pumping the water out of the 850 ft shaft. Then the progress of development will be rapidly prosecuted. The company is incorporated.

Mines Sold.—The Highland Mary has been sold for $100,000, and Ohio $225,000—all of Wahoo.

Ruby.—The Ruby heading is in hard rock, so much so in fact as to require no timbering.

NEVADA.

WASHOE DISTRICT.

Overman.—*Enterprise*, Oct. 25: The drift on the 2275 level has been extended 22 ft. We struck a small stream of very hot water, which makes the drift very hot. We have re-timbered 30 ft of the shaft near the surface. The Forman shaft has been sunk and timbered 15 ft; total depth, 2,100 ft.

Potosi.—Work on the 2400 level has been suspended, and the air from the blowers turned into the Savage drift, to aid in removing the bulkheads and to allow of other work in that drift, as when that is opened it will materially aid the work on the 2400 level.

Alpha.—Have been engaged the past week making repairs on hoisting machinery, and operations in the mine are necessarily suspended until these repairs are completed.

Consolidated Imperial.—Operations in the mine are temporarily suspended on account of the stopping of hoisting engine and surface machinery for repairs.

Gould and Curry and Best and Belcher Shaft.—The joint west crosscut, 2300 level, is in a distance of 40 ft. The ground is hard and requires no timbering.

Chollar-Norcross-Savage Shaft. — The hydraulic pumps are running steadily at 9 revolutions per minute, easily taking all the water. There was no increase of water to speak of when the bulkhead in the Savage drift was blown out.

Caledonia.—We have finished re-timbering the shaft. Re-timbered 105 ft. The pumps have run an average of 7½ hours per day, consuming 4 1-7 cords of wood per day. The Forman shaft has been sunk and timbered 25 ft; total depth, 2,100 ft.

Sutro Tunnel.—Prospect Drift on the vein at point 4035, South Lateral—The east crosscut has been extended 11 ft, making the total distance of the crosscut 31 ft. The face of the crosscut was still in vein porphyry when work at this place was discontinued and resumed in the drift. This drift has been extended 11 ft, making the total distance from the south lateral tunnel 124 ft. Its course is along the west wall of the vein.

CANDELARIA DISTRICT.

Northern Belle.—*True Fissure*, Oct. 29: In the first level, near the center of the mine, a body of ore has been opened showing a width of 2½ ft, which looks quite promising for the future. The intermediate level, between the first and second levels, on the hanging stope, shows a very fine body of ore 10 ft wide, and of very good grade. The same level, between the second and third levels, looks fully as promising as last week. The other shaft levels show no material change. The levels above the edit present about the same appearance as at time of last report, and are yielding as usual. There are being extracted and sent to the mills about 80 tons of ore daily. Both mills are running steadily; Mill, No. 1, on half time. Bullion shipments for the week ending Oct. 20th, amount to $10,935.51; and aggregate $67,634 00 on October account to the above date.

Mount Diablo.—Winze, No. 1, shows no change in the bottom. In the north crosscut, 40 ft above bottom of this winze, the ore has been followed to the east, but at present there is only a small streak of little value. The north crosscut from winze, No. 3, is in 55 ft and shows a black ledge formation in the face that looks favorable. The east drift on the third level shows no special changes. It has given some very good bunches of ore during the past week, and an advance of 12 ft has been made. The rest of the mine shows no change worthy of note. Winze from the east drift, second level, is down 23 ft. Winze in gulch is down 147 ft.

CHERRY CREEK DISTRICT.

Exchange.—White Pine *News*, Oct. 20: J. H. Roberts Supt. of the Excheage Co., who has been in New York for some time, has returned to Cherry Creek. Mr. Roberts' object in going East was to make arrangements with his company for the erection of additional reduction works for the ores, and a more extensive working of their mine, which he has succeeded in doing. He has commenced to make the contemplated improvements, which, when completed, will greatly increase their bullion production. They will also open up their large ore body below the water level, which has heretofore only been worked to that point, though explored for 600 ft in length,

ESMERALDA DISTRICT.

The Cortez Mine.—Esmeralde *Herald*, Oct. 27: Work is progressing favorably in all parts of the mine. The lower tunnel is in good blasting ground and is being pushed to the ledge. The incline sheft is being driven down as fast as possible. When the lower tunnel and incline shaft reach the same point in the ledge, we expect to see lively work on this mine. The carpenter shop is finished and the coal house is now in course of construction. Everything in and about the mine is running very smoothly under the able management of Supt. Wells and his assistant, Foreman Murphy.

The Centennial mine is looking just splendid, and, as J. B. Hiskey expresses it, is certainly a "big little mine."

EUREKA DISTRICT.

Struck Water.—Eureka *Sentinel*, Oct. 29: Water has been struck in the new shaft of the Satelite mine at a depth of only about 40 ft. It came in so strong thet the contractors had to abandon the work of sinking for the present. Water so near the surface is unusual in this district. It is explained on the theory that the shaft was started in shale instead of limestone. The shaft was designed to tap the ledge on its dips.

The Richmond Superintendency.—So far as known no person has been selected to take the place of Mr. Rickard as superintendent of the Richmond. The general impression seems to be that some one will be sent out from England. In this connection it may be stated that John B. McGee is reported to have made application through Manager Probert for the position. Mr. McGee was the old Supt. of the Richmond, and handled the immense property with great ability and success. He is one of the best smelters in America, and is altogether a first-class business and mining man.

Banquet to Supt. Rickard.—The bead officers of the Richmond Co., with A. E Titus at their head, are to give Supt. Rickard e grand banquet at the Jackson House on Wednesday evening, Nov. 9th. Mr. Rickerd retires from the control of the property with the good will of all who have been associated with him. The proposed banquet is tendered as a mark of great esteem entertained for him by his subordinate officers. Mr. Rickard is also highly respected by the community in general.

Coming to Examine.—A prominent western mining man will shortly visit Eureka to examine a Prospect mountein mine with a view to purchasing it for San Francisco parties. There ought to be 20 Eureka mines on the San Francisco Stock Board. The district has a splendid reputation, and the stock of promising mines should sell readily at fair figures. Besides the assessment plan is the best system yet devised for developing a property. Our miners who are unable to prosecute the work of development should incorporate, distribute the stock and call for assessments. This is the true way of getting down into the bowels of the earth.

No Truth in the Report.—It has been reported on the streets that both furnaces at the Eureka Con. works were about to be shut down. We learn from the best authority that such is not the case, and that at least one furnace will run all winter.

Eureka Tunnel.—*Sentinel*, Oct. 30: The south drift shows marked improvement. It has rich ore in every direction. It is being driven about two ft a day. The ore is as strong, and presents as many indications of permanence as at any time since it was discovered. Sinking the winze will be resumed to-day. Some days have been consumed at this point in putting in a windlass and ladder. The windlass was got in shape yesterday afternoon. Five or six men are kept sacklag ore. The teams are running regularly. Mr. Porter, Gilmer & Salisbury's mining expert, made a thorough examination of the mine two days ago. He was highly pleased with the ore body. He expressed the belief that it will prove to be one of the largest deposits ever found in the State.

PUEBLO DISTRICT.

Copper Mining.—*Silver State*, Oct. 22: J. C. Wear has gone to his copper mines in Pueblo district, with a wagonload of supplies. Some 5 or 6 men are at work on the mines, and will continue prospecting there during the winter. Mr. Wear says there is now sufficient ore in sight to warrant the erection of a smelting furnace; but those who are associated with him thought it advisable to develop the mines this winter, and in the spring build furnaces to smelt the ores. Those copper mines were located years ago, and Mr. Wear obtained a United States patent for them, but they have never been worked to any great extent until this fall. There is abundance of wood and water in the vicinity, so that furnaces can be run without much expense.

ARIZONA.

Bullion Shipment.—Arizona *Miner*, Oct. 29: The proprietors of the Silver Belt mine, Agua Fria district, are turning out bullion in large quanties and shipping the same to San Francisco. Last week 6 tons were sent forth and a like quantity awaits shipment at the smelter. The furnace will continue in operation for a long period and at least $50,000 will have been shipped before closing down for repairs. The Belt is one of the most promising mines on the Pacific coast and some of these fine days will sell for a million of dollars.

The Mammoth.—*Penal Drill*, Oct. 29: This mine is situated about 1 mile to the north of the Queen mine. It is showing up finely, as development proceeds. There are 4 ledges passing through the claim, 3 running north and south and 1 east and west. Two shafts have been sunk at the intersection of 2 ledges with the east ledge. At a depth of 40 ft they show high-grade ore, several pieces of rock averaging $150 and some as high as $500. The ore is as near free milling ore as can be found in this district. The ledge measures 20 feet, with a pay streak of about 4 ft in width.

The Solferino, formerly the Hope mine, is what may be called an extension of the Mammoth, for the same ledges, 3 in number, seem to pass through it. One of the ledges is from 30 to 40 ft wide, carrying high-grade red and grey carbonate ores of a superior quality and in large quantity. All the ledges prospect well. On the main ledge a shaft has been sunk 45 ft in depth, showing fine carbonate ore from top to bottom. Besides the 3 main ledges there are cross ledges. Assays of the ore average $140 a ton, silver, and a few dollars in gold.

Reported Sale.—Tombstone *Epitaph*, Oct. 27: It is reported that the property known as Smith's ranch, at the mouth of Copper canyon, near the south end of the Huachuca mountains, has been sold for $5,000. This is one of the most romantic pieces in southern Arizona. The mountains rise abruptly upon both sides of the canyon, being covered to a great extent with live and black oak timber, and higher up the canyon with pine and fir. There is a beautiful never-failing stream of water, fed by living springs that burst out of the sides of the mountains. The mesa running down to the San Pedro for a mile or 2 is beavily timbered. It is a magnificent place for a summer resort. In the season of growth Mr. Smith has always had the fluest of vegetables and melons. It is said there are very rich copper mines in this canyon, and that this purchase is in the interest of a strong company, who will enter upon the development of that locality.

COLORADO.

Berlin.—Silver Plume *Coloradoan*, Oct. 22: This lode on Hanna mountain is a relocation of Robert Bros. & Co., and shows from 8 inches to a ft of quertz, through which galena and a large share of gray copper is very liberally scattered. It is considered an exceedingly good prospect. Depth only 10 ft.

Baltimore Tunnel.—Mr. Moore, foremen, informs us that there are about 40 leases at the present time working on the company properties, and all of them are taking out pay ore. Their dump which is now on the ground of the old toll-road, is aver 90 ft high, to which a new track has been laid since the fire.

Bismarck.—Two of the owners are working from crosscut No. 3, and the third one will join them next month. They commenced stoping about the first of the month, since which the ore has been increasing both in quantity and quality as they have ascended with the stope. A mill-run from the lower part of the stope contained 100 ozs silver per ton; but the ore they are now taking out they expect to run much higher.

Dives-Pelican.—The lease of Phillips & Co. is on the Unicorn about 30 ft below the tunnel level and east of it. They have been at work only 2 weeks, and are stoping up the tunnel level, having from a ft to 18 inches of ore. An assay of what was thought to be an average sample of the same carried $70 ozs. Four men are at work taking out a ton and a half a week. In the main shaft the company has struck 8 inches of low-grade ore.

Backbone.—The Backbone Mining Co. were found on a late visit of the mining reporter to thet property, engaged at moving the whim down to a level with the dump for the more convenient hoisting of ore. For the past 3 months they have been busy re-timbering shafts, cleaning out drifts, etc., for the more thorough ventilation of the mines and putting the mine generally into a shape for extensive work the coming winter. The lode through all its openings shows a continuous streak of ore from 4 to 8 inches wide, and when properly opened ought to be one of our best ore producers.

IDAHO.

Rich Seam.—Idaho *World*, Oct. 25: A very rich seam was struck the other day in the Sub Rosa, about 120 ft below the surface. It varies in width from 6 inches to a ft. The vein is probably a spur of the main lode. If not, the main ledge is split, with a "horse" between. This new vein has considerable more dip than the one previously worked, which indicates that the 2 come together nearer the surface. A crosscut was run into the old works—a distance of 35 ft. If the 2 veins have been separated by a "horse" they will no doubt come together deeper down. It matters but little whether it is a spur or feeder, or whether it has been split off from the vein. There is a good body of ore that is more than ordinarily auriferous, and the owners don't care what direction it takes or what it will turn out to be, so the vein holds its width and the pay don't "peter."

Ketchum Smelter.—Wood River *Times*, Oct. 26: A half a dozen teams loaded with bullion produced at the Philadelphia M. & Smelting Co.'s works at Ketchum, passed through yesterday, on the way to Blackfoot, whence it will be transferred to railway cars for shipment East. The smelter is running smoothly, producing from 15 to 18 tons of bullion, averaging 245 ounces per ton, per day. About 75 tons of bullion have been produced, of which about 50 tons have been shipped. As the bullion is of comparatively low grade, it is evident, that none of the ores from the company's mines have been run through yet, those ores carrying from 400 to 1,000 ozs. per ton.

Jay Gould.—The best showing of Bullion just now is undoubtedly made by the Jay Gould mine. This property is being opened up in a systematic manner, and shows improvement with every foot of progress. Up to the 2d of October the Jay Gould mine had yielded 245 tons of ore, which sold in Salt Lake City brought $34,300, or an average of $140 per ton. Much of this was surface ore, however, and is, therefore, no criterion of the value of ore in depth. Since the 2d of October very large shipments have been made.

MONTANA.

Notes.—*Inter-Mountain*, Oct. 20: At a depth of 200 ft a west drift has been started on the Morning Star which has penetrated the ledge for a distance of 14 ft. The 325-ft east drift of the Cannon has reached the end line of the claim, and a drift west has recently been started. The stopes are all looking well and are producing monthly about 500 tons of ore, which is sold to Mr. Williams, at the smelter. In the Magna Charter a very large mining force is employed in the various levels and the ore output is now about 40 tons per diem. A station is being cut out at the 300 level and sinking will be resumed in a few days. The machinery has been giving some trouble lately, but the necessary repairs have been successfully made. The Alice is still closed down awaiting the completion of the repairs to the hoisting works boilers which latter have been in continuous operation for 33 months. Mining operations will be resumed in about 3 days, and in the meantime the mills are running on ore reserves of which about 7,000 tons are on hand.

Silver Star.—Butte *Miner*, Oct. 27: From a gentleman who has just come in from Silver Star we learn that the Orecn Campbell mine is being opened under the superintendence of Mr. Price. A new shaft is being sunk, and the mine is being put in thorough working order. The erection of a new mill is also contemplated. In the Ajax mine some good ore has been struck. The strike was made in their western working, which is running under the tunnel of the Mutual Agreement mine. The Broadway is opening out well. A large body of ore has been struck in the 75 level, of a higher grade than before taken out and free milling. Indeed the prospects of the Broadway Co. look very favorable in every direction. Under the prudent guidance of Prof. A. E. Walton they can scarcely go very far wrong. The Broadway Co. has been at work a short time, and has already had 2 runs. Prof. Walton returned last evening with the second retort, which is a large one and has been deposited with Donnell, Clark & Larabie. The English Co. have cause to congratulate themselves that they succeeded in obtaining this valuable property, and great credit should be given to the parties who so skilfully negotiated the sale in their interests. The other favorable circumstance for the future of the Broadway mine is the fact that its present management is carrying on operations in so intelligent and energetic a manner. The activity of foreign capital should excite other mine owners to develop their properties. We understand there are other good mines in Silver Star which will pay well for the investment of a little capital. The graders of the Utah & Northern road from Dillon to Helena are now at work at Silver Star.

NEW MEXICO.

San Pedro.—*News and Press*, Oct. 22: A 4-horse coach will soon run from Wallace to the San Pedro mines.

Water Canyon.—Mines in the Water Canyon district are being worked vigorously and are looking well. A new town is being laid out.

Dry Washers.—Two machines for testing the placers at Los Cerrillos station are now on their way to that place. They were built by the Hall Dry Amalgamating Co., and are of the capacity of 30 and 15 tons each.

Ready.—The Los Cerrilloe M. & Smelting Co., of which Gov. Tabor, the Colorado millionaire miner, is president, has taken hold of the old smelter at Cerrillos station, that has long been lying idle, and having salaraged and refitted the buildings, overhauled the machinery and added improved machinery, is now ready for business on a large scale.

New Smelter.—The Shakespeare Con. Smelting Co. is erecting a 25-ton smelter half a mile from Shakespeare, in Grant county. When completed it will start up on custom work.

Items.—The mines about Shakespeare are looking exceedingly well, and developments bring forth a better class of ore than near the surface. In the Last Chance mine a double-compartment working shaft has been well constructed and development systematically prosecuted. Steam hoisting works have been purchased in Denver, and proper machinery will be duly erected. There are 1,800 tons of ore on the dump. The Vida mine's shaft, down 120 ft., will be relieved of water by a steam pump. A new working shaft is now going down. The Atwood has a steam hoister, now utilized to crush the ore, that is sacked and shipped to Denver. It is good smelting ore classed in three grades, the lowest showing up handsomely. A daily stage line runs to Silver City, and a stage twice each day to Lordsburg, on the Southern Pacific R. R. The town is growing and new houses constantly going up.

Monte Christo District.—Cor. *New Southwest*, Oct. 20: Orent county has now a mining interest in the Mogollons. Owing to many recent discoveries in Little Dry Creek and vicinity, a miners' meeting was held and a new district was organized. The new district is about 10 miles square. The formation in this district is different from that of the Cooney, and the newly discovered lodes differ materially in size and general character. Apparently the leads are true fissures, and with three exceptions are strictly gold-bearing leeds. Repented assays from several claims show an average valuo of $20 per ton in gold.

Golden Copper.—The Golden Copper vein is one of the most wonderful in many respects that has ever been discovered in New Mexico. It has for its hanging wall an immense dyke of quartzite, its other wall being porphyry. It will average 30 ft in width, although attaining 75 ft in many parts, and cross cut plainly for 9,000 ft. The ore is a black oxide of copper, carrying gold. Five assays have given an average of 18% copper and $15 gold. The next copper claims in value are the At Last and Unmatched, discovered by Jos. Sheridan and T. C. Clark. Of the gold lodes in this district the Dolaware and Little Chief are attracting the most attention. This lode is 80 ft in width, running $18 in free gold per ton. It is claimed that capital is hunting large bodies of low-grade ore of easy reduction. Here it is in immense quantities. All of the mines in this district are located on the banks of streams that run the entire year. The hills are densely wooded with pine, oak and juniper. Wagons can be driven to almost any part of the camp, even though no roads heve as yet been made. The distance from Silver City is about 50 miles, leaving the Clairmont road five miles above Duck Creek ranch. We could say in conclusion that the value of these immense fissures, the almost unequalled facilities for working the mines call for attention from men desiring to secure paying properties.

UTAH.

The Horn Silver.—*Southern Utah Times*, Oct. 22: Those who have so long wondered if the Horn Silver would ever pay another dividend, now have the satisfaction of knowing that one of $200,000 was declared on October 1st, and is payable at the company's office in New York city.

Marysvale.—Our correspondent, who just returned from a tour of inspection through the Marysvale region, says that matters there are progressing very slowly, the grade being unfinished. About 75 men are at work, straining every nerve to complete the mill within contract time, i. e., November 15th, but with no apparent prospect of success. By the terms of the contract the mill will have to be in running order at the time specified, or else stand the forfeit of a large sum of money. Assayer Henry, one of the interested parties, said, in a recent conversation at Beaver, that unless the mill was ready to "start up" on the 15th day of November, he proposed to make it hot for the Copper Belt Co. A 5-ton semple of that company's ore sent to the Roef for mill trial, showed very satisfactory results.

Deer Trail.—This mine is being worked by a small force, and is producing nothing in proportion to its capacity.

Crismon Mammoth Mine.—Salt Lake *Tribune*, Oct. 30: Tintic is again taking the position it is so justly entitled to, and a great amount of work has been done in the mines during the season. The California Central, now under construction from Lehi to Tintic, will soon reach this mining district, and a boom of extraordinary size may soon be looked for in this meritorious section of Utah. The Crismon Mammoth, which has long had the reputation of one of the largest gold and silver mines in the United States, is looking as well as ever. It gives employment to 32 men, and is showing a body of ore 80 ft in length and 30 ft in hight, assaying from $35 to $300 in gold and silver, while the gulf and middle workings show thousands of tons of baser ores, assaying $65 gold and silver, and 25% copper. Stoping continues in the north drift in a big body of ore. In all the levels and drifts large bodies of rich ore have been uncovered, all going high in gold and silver. The mine was never in better condition than at the present time, and there is ore enough in sight to keep a 100-stamp mill busy for years

Precious Metals in the South.

Doubtless there are 50,000 msn from the Southern States who are seeking fortunes among the mineral regions of the Rocky mountains. Meny are laborers in great bonsnzas at from $3 to $4 per day; some are prospectors, and meny are huyers and speculators in mining properties. In Daniel Boone's time, and etill later, eays the "History of Kentucky," the Indian tribes of southeast Kentucky and eastern Tennessee brought very large quantities of native silver to ths whites to trade for goods. It had been smelted or redneed into rongb bullion by some process nnknown to the whites. So, is it not etrange that Kentuckiane ehould not have taken this hint from the history of their State, and engaged experienced prospectors to locats the veins which produced that silver?

The other Southern State intereeted, and wbose citizens and capitelists are to be found in every mining camp, is Missouri. The St. Louis emelting and rebning company erected the first emelter and worked the first ore at Leadvills, Col. The cream of that great camp was carried off by capitalists of St. Louis before stock tricksters began tbeir mine killing operations there. Texas has thousands of operators in Arizona, New and Old Mexico. There are several mining companiss of Florida operating in Colorado, New Mexico, California and Arizona. Louisiana is spareely represented. There are two organized companiee in New Orleans. One of them, tbe Hanselman Willet-Muncy company, has 17 mines and fractions of mines in Custer county, Col. Edward Enderle, of this city, is on the ground superintending the work. Thomas Hunton, attorney-at-law, and associates in New Orleans, are interested in mining properties in different parts of the West. The above ie introductory to demonstrats how men will go so far away to invest in mining, since now it is down to a solid businsss basis, wbile close at bome are the same untold millione in hills and mountains—precious metals awaiting man's bsnd with picks and sbovel to explore and extract them.

A prospector wbo has bad many long yeare of toilsome experience prospecting in the great mineral regione of tbe far away west, a few montbs eince passed three months surface prospecting in Nortb Carolina, east Tennessee and southwestern Virginia. He has obtained a copy of a very old map, copied from an older Spanish map. The map represented this region as almost solid in lodes or veins and deposits of precione metal. He found veins out-cropping clearly and plainly, witb perfectly defined walls. Many a mountain of granits rock had veins of mica in it. Tbis mineral is at present in as pressing demand as gold. The largest piecee bring fabulons prices for windows of vessels of war and steamships. Tbose from 2 inches wide to 5 or 6 to 8 inches in length, a lasser price for tbe coal stove industry, still an immensely profitable one. Ths third class is a great body of the vein—fully 80 % of every vein—which comes out broken into fragments. For thie the demand is greater than the supply, and must remain so as long as it is coming into general use as a lubricator. The railroads pay eo mucb for it that, as the supply is not equal to their demaad, other peopls cannot afford to pay for it as a lubricator. The axles of tbe swifteet lightning trains lubricated with tbe micaceous lubricator neither heat nor wear away. Since this discovery was made, the Rocky mountains, supposed to bold all minerals excspt iron and coal that are valuable, have been prospscted over and ovsr, especially near the Arkausss river above the grand canyon of the Arkansas and Royal gorge. Tiree claims were found in an uncertain, broken condition in 1876. They cannot be made to yield well or much. Twenty months ago a 14-inch vein was discovered south of Santa Fe. It sold for $19,000 cash when 10 ft. deep. It will be seen by the notee below that North Carolina is supplying about all the world is receiving, and yet cannot furnish enough. It is wanted as a lubricator for all kinds of machiues.

The Nortb State Mining Co., of North Carolina (English capitalists), have a vein of mica eigbt ft. in width, four ft. of which is solid mica. This is of the lightest color, free from iron etains and very flexible. This company owns 4½ miles of fine iron ore, which lies in hede from 10 to 40 ft. wide. They have 125 men at work on the iron ore. Tbey are building a railroad from Statesville througb Salisbury to their mines. They are erectiag smelters and mills. One mill was completed early in August, and they began orushing August 20th.

The Conrad Hill copper and gold mine people near Salisbury are pushing work, and are advertisiog for 300 more hands. In the same vicinity, the Silver Valley mine is working 75 hands.

Tbe Baltimore and North Carolina mining company are erecting a mill. Thie property is five milee west of Aehboro. The ore is quartz, mining up to $80 in gold per ton. (The average yield of gold of tbe Black Hille for eight yeare has been $7.50 per ton.)

The Hoover Hill gold mine ie owned by Englisb capitaliets. The ownere are driving ehafte and tunnele, constructing tramways, etc. Their new mill will be at work by October 1st. Tbe Atlas and Bame mines, near Salisbury, compriee 1,351 acres of ground, purchased by Mr. Leopold Graf, a capitalist of Newark, N. J. This ground ie proven rich; it liee between Gold Hill and Dutcb Crook minee.

Tbe Clarissa mica mine, near Bakersfield, county eeat of Mitchell county, ie a 4-ft. vein of mica, owned by Mr. J. G. Heap and John Clapp. They have several shafte, the deepest of which is 325 ft. They are working a very large force, running six ehafts, which average 85 ft. The same parties own and are working the Sink Hole mica mine, and the Cook mica mine, all in the same vicinity.

The Reed gold mining company, of Cabanus county, are finding, in washing, nuggets weighing from 1 to 5 ounces. Thie county furnisbed the Indian tribes of a large region of country, gold for their ornaments. Every creek aod strsam bottom of that county ehows plscer gold mines. The Backs mine, 10 miles from Lexington, is being worked with quite a large forcs. At the Stelle mine, near Salisbury, thsy have struck a rich pocket running into hundreds of ounces in gold to the ton. The Ward mins, near the eame place, is a valuable property.

The Weed mine, recently purchased by Thurlow Weed, is paying well. It is located near Lexington, Davidson county. Without at present mentioning any of the othsr hundreds of properties of North Carolina, these will show far greater development than the Southern people ever dreamed of as going on in the South. North Carolina is bardly tickled as far as her vast mineral wealtb is concerned. Not a thousandth part of ber precious metal-bearing ground has been toucbed. The prospector mentioned above, found precious etones in great abundance near the mountaine and below the mountaine for many miles. Red garnet is more abundant in the valleys and along etreame and in their beds in Catawba connty, than elsewhere discovered in tbe world. Ametbyst, topaz, limpid crystale, opals, and other valuable stones, are abnndant. It requires study and experience to detect tbem, for, like the diamond, all are covered with a rough outside. No more profitable mining field can be found tban western North Carolina, and the field is not confined to North Carolina alone, but Tennessee, southeastern Kentucky, South Carolina, Georgia, Alabama, northeastern Mississippi and Virginia ehow nearly as well. There is more mining machinery in Nortb Carolina than in New Mexico and Arizona togsther to date, and that tells the story. Nickel, platinnm, cobalt, and tbe various argentiferous ores of galena—ores of lead—are abundant also.—*New Orleans Times.*

Yield of Mines.

From the date of the discovery of gold in California, mining bas been eteadily, and for the past fow yeare rapidly, gaining public confidence, and now it is justly regarded as a legitimate, safe business—one of the most important industriee of civilization. When that discovery was made, the great mase of people was incredulous, regarding ths announcsment as a sort of "Arabian Nights," or the tals of "Aladdia's Lamp," revamped and published uader a new title. It is a historical fact, however, that since that day California has produced $1,000,000,000 in gold. Astounding as this statement may appear, it is none ths less true. Tbe same incredulity was manifested about tbe discovery of gold in Aust alia, but, notwithstanding that, ths island continent has produced £200,000,000 in gold; and the grand total productions of bullion from all sources since 1848 amount to $5,862,165,000.

When the silver mines of Nevada were discovered, no oae believed, not even Comstock, tbe discoverer, nor even contemplated the vast treasures etowed away in those inhospitable monntsins; but Nevada has sent out $275,000,000 of silver, and the production of the United States since 1852 has bsen $340,310,545 Then came Colorado, Montana, Idaho, Utah, Arizona, and tbe Black Hills, each baving to stem the tide of popular distrust, to prove by actual demonstration the existence of precions metals in tbeir river beds and monntain ranges; bnt tbey bave given their millions to the commerce of the world.

The fact that one-half of the territory of the United States in mineral-bearing and the mining interest is rapidly assuming colossal proportions and is already of immenee value and importance, demande recognition. The Government has for some time snpported a department of agriculture and it is a question whether the industry of mining for the precione metals, gold, eilver, iron, copper and lead has not grown to be of sufficient worth to be entitled to the same care and assistance which is bestowed upon other and less important vocations. The magnificent resources of thie conntry will never be fully appreciated, and the value of its mining industry never really understood nntil eome great wave of fiaancial disaster threatene the foundation of our national prosperity. Then to find a thousand mines ready to pour ont treasure like water, and a mineral territory large enough to meet the world's demand for a substantial currency, will turn aside the force of the blow eo that if our people are wise in time we may laugb when calamity threatens us with destruction.

The Hardy Prospector.—During tbe past two or three daye we have noticed little partiee of three or four men riding into town on tired eaddle borees, leading jaded pack mnlee. These rough-looking fellowe are the men wbo are keeping up the country by proepecting for new mines. Every dollar they get they earn fairly enough; and in too many cases the fruits of their labore are reaped by others. Long life to our uoble army of hardy proepectors!—*Boise Paper.*

Magazine District.

Since the ricb strike in the Red Rover mine, a good many prospectors have been in tbe vicinity, and several locations have bcen made, which are thought to bs "way up." Previous to tbe discovery of the Red Rover, by old "Rackensack," there had often been prospectors in ths Rsd range, but they always reported no signe of mineral. The ledges throughout this whole region are capped with copper-stained rock, and no one has had the pluck to sink a few feet to determine their character. Thie development of only 50 ft on the Red Rover, discovering a large body of $2,000 to $3,000 ore, will revolutionizs the old method of prospecting here, and from this on we may look out for big strikes. Men have been scratching on the surface with little poll-picks, for years, and the result has been positively nothing. They get an assay of tbe top rock, which seldom exceede twenty-five ounces, become disgusted and "throw up" the prospect. There are many msny large ledgee of this character in tbis and Cave Creek districte, which have been located year after year, by different parties, but which have never been even worked to the amouat of a year'e assessmsnt. Many of these will now be sunk on, and some will undoubtedly run to eilver, inasmuch as it ie becoming very well demonstratsd that the lsrge copper prospects througbout Arizona ars often hut cappings of eilver. Among those who have lately taken locations on the Red Rover ledge are Dr. Jones, Frank Shaw, Major Chaffee, Phil. Sheridan, Prof. Flemming and others, all men of uudoubted judgment in mining matters. The numbsr of extensions taken on this mine is astouuding, though it is whispered that every location within a radius of three milee is claimed to be an extension. There is no doubt, bowever, that a mineral belt can bs traced, both northeast and soutbwest, from the Red Rover for several miles. Cram mountain is a fine mineral locality, about four miles to ths southwest, wbere a group of large ledgss of copper, glance, gold and low-grade silvsr have been gouged at for the past 10 years. Old Rackensack is oow prospecting a little to tbe northward of Wood's station, and has discovered a ledgs of three to fonr ft. wide of rich copper glance, near Rodgers' Spring. The formation is fine porphyry. He desires to get some ons to take a working interest in it. The weather is unprecedentedly hot hers for tbe season.—*Arizona Gazette.*

Ocean Wave Power.—The Directors of the Swalee Ocean Wave Power company, Messrs. O. F. Willey, P. H. Csnaven, C. J. Hutchinson, W. C. Doane and John Lyons, recently petitioned the Board of Supervisors for permission to open the public streets for the purpose of laying down mains and pipes for carrying salt water, for compressed air and for electric uses. Their petition was referred to the Committee on Water and Water supplies. It aunounces that the corporation wss formed for the purpose of furaishing motive power by mesns of the action of ocssn waves and tides, with which to supply salt water to the city for watering ths streets, flushing the sewers, supplying public and private baths, extinguishing fires, and for other municipsl and private purposes, for driving machinery, compressing air and generating electricity, and for all manufacturing and commercial parposes. The projectors bave exhibited drawings of their proposed machinery. Ahout 15 years ago Mr. J. S. Silver urged a petition similar to the one aoove spoken of.

Fitzgerald, Turquois District.—Recent mill runs from the Fitzgerald, owned by Hortong, Sorin and others, have attracted considerable attention to the northeastern end of this district, and we hope will result in giving a etert to that camp, than which oone in southern Arizona ie more delightfully eituated. But little development haa yet been made on the property, but three millinge hy the Boston mill of ton lots proves the ore to average over $70 to the ton. The ore is white and red quartz filled with gresn horn silver and cbloride. Another promising prospect is the Silver Cloud, owned by Packard, Leavenworth and others. Work on tbis property was resumed tbis week and the shaft and dump ehow a fine ledge of pay ore.—*Epitaph.*

The Lead Market.—The New York *Mining Record* of the 15th says: The demand for first-hand parcels has been quite moderate during the past week, and but few transactiooe have transpired. Consnmers appear to have supplied their preeent requirements in a great measure, and are not disposed to further replenish their etocke. Common pig has been offered and eold at 5 1-5 to 5¼ cents, which ia the present market value, and corroding is nominally held at 5.35 to 5½ cents, but we do not bear of any sales.

The *Enterprise* now heare more talk about Candelaria thaa eny other outside camp. That they have good minee there, both prospected and unproepected, ie well known, but heretofore the place bas been difficult of accese. Very soon the Carson and Colorado railroad will be rnnning to that camp, bringiug it out of the wilderneee at once, and uniting it with all the eources of eupply, as regards machinery and all elees

Hydraulic Mining a State Benefit.

The miners believe that tbe suits bronght against them are nothing more than a gigantic scheme to enrich a few lawyers. One suit would dispose of the merits as well as 20. Sacramento has fallen in line with a reteiner of $12,000, and other countiee are being pressed to follow that example. The State Engineer assessed the damage of 30 years mining at less than $5,000,000. An insignificant amount compared to the hundreds of millions of wealth extracted by our hydraulic minere, and from whicb ths agricultural population has derived great bsnefit. And further, to offset this damage, large areas of land heve been reclaimed by slickens, wbich is notably the case in thie county. Thirty-two companies were sued on the Yuba and only four injunctions served, and those on companies supposed to be owned abroad. Fourteen hundred msn, mostly having homes and families, were thrown out of employment. Minere believe that if proper influences and money are used, exemptions from service of injunction can be secured, and therefore do not feel that confidence in the law wbich exists in other communities, especially as Judge Keyser wae elected on the issue of bis well-known hostility to the miners.—*Georgetown Gazette.*

Salmon River Mines.

A member of tbe Klippel company arrived in Lswiston last Monday, and informed us tbat the company had etruck pay gravel—on the scene of their wing-dam labors on Salmon river—of sucb a character that they were taking out $2,000 every 24 hours, and that he was on hie way to Portland to order tho necessary machinery to work the diggings on a more extensive scale.

There are, along the banks of the Snake and Salmon rivere and their forks, hundreds of these claims, as rich and equally adapted for work as the Klippel.

We can now announce to the world tbe positive fact tbat no country presents more or better inducsments for the profitable investment of capital in mining enterprises than north Idaho. It is, in fact, a common practice among foot-loose and dead-broke miners to make a grub stake for tbe next prospecting season with a rocker planted on the nearest Snake river bar; $4 or $5 are easily washed in as many houre by this simple mining process, but the honest miner scorns to make what be calle "China wages" by China miniog, and the rocker is only used when be is desperately bard up. But the gold is there all the eams.—*Nez Perce News.*

Costly Idleness.—Those four months during which the hydraulic mining companies enjoined hy Judge Keyser, permitted their properties to lie idle, composed a very disastrous period. The North Bloomfield, Excelsior and Milton companies each sustained losses approximating $100,000. The Blue Tent compsuy suffered to the exteut of about $50,000, aod the Union compsny not less thsn $40,000. The American company were compelled to let their claims be sacrificed under the sheriff's hammer, and their loss cannot be reasonably put at a lower figure than $50,000; for had tho bugaboo of an injunction not put in aa appearance, the wreck would, we are told, not bave occurred. The 21 other hydraulic companies made parties to the suit, although not enjoined with the above corporation, daily expected the wrath of the plaintiffs to be directed at their own heads, and the dead-lock extended to nearly all of them; so they hesitated about laying in their supplies aud making other preparatione for the winter'e work. Their total loss will exceed, as shown by a careful estimate, $300,000. How much tbe employees in the various mines, and the mercantile and other branches of industry carried on the hydraulic mining regious have suffered in dollars and cents, cannot be arrived at, although the amount is certainly large. To offset all this is a bond of $25,000 filed by the plaintiffs.—*Nevada Transcript.*

Sunny South.—After we bad gone to press, a week ago yeaterday, we received a call from Mr. M. H. Power, of Sunay South. Sunny Soutb is emphatically a mining town, has a population of between 100 and 200, mostly men, aud yet the place hee aever had a policeman or a constable, and has never needed auy. In spite of this showing the Sacramento *Bee* ineists in referring to the miners as a rough, rowdyish, uncouth, boisterous and lawless set. Nothing could be further from the truth. As a rule, miners are more than ordinarily intelligent. They read the papers and pay for them. They are particularly well posted. They are loyal to the core, and they are respecters of law aad order. No man ever treated a miner well and received ill treatment of him in return.—*Placer Herald.*

Quick Work.—A diepatch of the 25th ult., from the Atlanta cotton expoeition, eays: "Nine governore are here and thoueaods of visitors to witness tbe opening of the exposition. Tbe visiting governore were welcomed to the expoeition in the afternoon, Gov. Colquitt delivering the address. Several governors reeponded. The crowd wae overwhelming, and great enthueiaem was manifeeted. The featnre of tho day wae the making of two euite of clothes—one for Gov. Colquitt and one for Gov. Bigelow—from seed cotton picked at 7 o'clock in the morning. The suite were worn at the reception in the evening."

Abandoned Mining Districts.

It is nothiag against a mining district that it was ahaadoned hy the original discoverers. Tbis fact is fully demonstratsd by half a dozsa districts iu Nevada. Ws note that Como, in Lyon couaty, is coming to the front as a bullion prodacer. Ia 1863 a prosperons commaaity was located at Como. A town of considerahle sizs spruog up, aad the place bid fair to be as permanoat as auy of its neighhors. Sahsequently tho town went dowa, aad ia a few years there was ant a man or house left to iadicate its former size. It was revived the past season, aad now has a population of several haadred. A quartz mill has hesn crected, aad several valuahls miaes are ia course of development. Who knows but what ouce-abaadoned Como may becomo oue of ths most importaat mining camps in the State?

White Piao has a history almost ideotical, oaly oa a graader scale. Thsy had the biggest boom of all the booms in the White Pine, but it gradually dwindled down until it hecame very thin, the population falling off from 40,000 to less than 300. Within the past year several important mining euterprises have been inaugurated there, aad we shall be disappointsd if her population does uot increase the comiog season.

Eurska District was discovered in 1865. It wae as good as ahandoned until 1880. Now it is the great miniog center of Eastern Nevada, prodncing ananally millioas of dollsrs, and supporting a population variously cstimated at from 6,000 to 8,000.

Bodie, the liveliest camp in California, to use a prospector'a term, was struck ia 1860, oaly a year later than the Comstock. It lay comparatively dormant for aearly 20 years.

Geaeral Coanor'a troops mado locations in Pioohe as early as 1864, but it was not until 1869 that the wonderful mines of that section hegaa to attract geaeral attention.

Aad so we might go on enumerating many other localities, but the above will suffice to show that it is not alwaye eafe to estimate the capahilitiea of a mining district uatil it has heen thoroughly tested with capital aad muscle. —*Eureka Sentinel.*

A Novel Fishing Device.—A new aad very destructive fishing device ie reported from the Columhia river, Oregon. It consiets of a jetty of rocks huilt out from a point on tho shore of the river, outside of which is a plaaked sluiceway, in which an undershot wheel with large taak hackete revolves. The sluiceway is built when the river is at ite lowest stage of water, aad the wheel is hung so that it can be raised or lowered as may he dcsired accordiag to etage of water. The instiact of the ea'mon is to run up the river aloagside of the haaks, instead of mid-chaaael. By thie the fish can take advantage of the eddies helow jutting points of land. On these projecting points the Iadiaas have, from time immemorial, taken salmon in large numhers hy usiag dip aets. The jetty, built out from the poiat, makes a larger and longer slackwator hehind it, and the aalmon roundiag the point rash iato the sluiceway to get up the river. In the sluiceway the wheel, which revolves in the current, is guaged so as to sweep within n foot of the hottom, and the salmon are scooped up in the huckets, which latter let out the water as they ascend. On the wheel descending the fisb are thrown out into a trough or gutter leadiag to a pen helcw, where they remain nntil taken away to he canned. The arrangement of the slnice, wheel, etc., is a most successful one, the catch of aalmon running from 1,500 to 4,000 per day. There is virtually no expense in taking the fish, save attending to the pen. A fatal objection to this device ariaes from the fact that it scoope up and kille little fish ae well as hig onea, and as yet no provision ie made in connection with it for the escape of tbe former. Unless the the threatened wholesale killing of salmon too small for canniag is prevcnted the supply will he eatirely cut off, and the entire canning industry destroyed, if the wheel comes into general use.

A Locomotive Attachment.—The model of an improved locomotive was recently exhihited at the shops of the Lake Shore railroad, in Cleveland, Ohio. The improvement consists of an attachment to he placed on the side of the hoiler, and ia intended to do away with the eccentric and cumhersome machinery connected with it. The arrangement is pronounced very simple hy those who inspect it, and locomotive engineere praise it highly. Mr. Anderson, of Painesville, is the inventor. It is claimed that the new arraagement can he applied to aay engine in ten houre.

A New Device.—Mr. Harris Tahor, euperintendent of the Hartford Eagineering Company, has introduced an ingenious way of fixing a ateel pin in a cast-iron crose-head, hy takiag a steel tube, turning it up true, and eetting it in the sand hefore the cross-head is cast. The gate runs through this tuhe, and in filliag the mold "hurns" the etsel tuhe faet on the cast-iron core. This method has the advantage of having the pin turned and finished hefore casting the cross-head, so that, heyond a little cleaning up, no work need he done on it.

Bears are said to be more ahundant in Butte county than at any time for 20 years. Deer are aleo working their way to the lower ranges, whicb is accepted as a sign of a bard winter.

Useful Information.

Wearing Qualities of Aluminum.—The *Manufacturer and Builder* furaishes the following usaful iaformatioa uader the ahove head: There is no ohjeotion to aluminum for such domestic uses as spoaas and tho like, ou the score of its wearing qualities, which are comparatively very good. This fact has heen experimeatally verified hy Herr Wiakler, a Gsrman chomist. To test in practics ths wearing qualities of aluminum, this chemist had made a number of spoons, rsspectively of silver, pure aluminum and Germsn silver. A spoca of each of the metals ahove aamed was accurately weighed on February 1, 1876, and all were put iuto use under precisely similar conditioas for the period of ous year. They wers nlsced in the same soups, sauces, soar salads and the like, and the servant whose duty it was to wash thsm, was givsn strict orders to cleau thsm saoh in the ssmo manasr. The oleaning coasisted substantially in wiping thsm with a woolsa cloth, washing them ia hot water, aad thsn riasing thsm ia cold. Soda was often put into the hot water, and the spoaas were thus daily subjected to hot acid aad alkaline solutious. The color of all ths metals altered ia time; the alnminnm lost its luster aad became of a dull, hluish-gray color; the Germaa silver also degensrated to a grayish yellow tint; the silver lost oaly in color, hut its luster was uot impairsd. As regards mechsaical abrasioa, ao marked differeace was perceptihle, although after a year's uss the aluminum showed distiact traces of wear at the edges. By accurately weighiag the spoone at the ead of the period aamed, the fact was estahlished that the loss of weight suffered hy the spoon of silver was 0.403%; by the aluminnm spoca, 0.630%, aad hy the German silver spoon, 1.006%. From the above facts, it appears for such domestic articles as spoaas, aluminnm stands wear very well, though not so well as silver.

Underoround Telegraph Wires. — The growiag necessity for placing telegraph wires uadergroand in cities, is eliciting much discussion in regard to some cheap and yet desirahle method of iasulatiag the wiree. A new material has recently bsen hronght to the attention of the public, which is said to he only ahout one-sixth the weight of iroa. It is composed almost wholly of pure carboa, in what form ie not etated, aad so is indestructihle; does not rnst nor change hy exposure, whether in the air or uadergroaad, as is not affected by frost. But the chief virtne claimed for it in connection with underground wires is that it is a perfect iasnlator. It is eaid, too, that the pipes need not he huried very deep in the earth, as they may he of a semi-elastic character, adjustiag themselves to the slight upheaval and depreseion of the gronud through the action of frost or other disturhaaces.

Fires from Electric Wires.—The possihility of firee from electric wires is occasioaiag no little uneasiness among the insurance companies, hut, as would appear, without reasoaiag. True, cahlegrams assert that the fire occurring a few daye ago at the Paris electric exhihition, was due to some wires put up hy the Fox Electric Light Committee of Eagland, but the chsirman of a committee appointed hy the Board of Underwriters some time since, to investigate the whole suhject, is authority for the statement that the committee are fully convinced that if the wires are properly insulated there is less danger from fire from electricity than from leaky gas mains and kerosene oil, and it is their intention to so report.

Imitation Amber.—Considerahle quantities of heautiful ohjeots of artificial amher are now being produced in Vienna. The snhstance employed in its manufacture is chiefly colophony, or resin, ohtained hy decomposition of turpentine, though several other ingredients are used to give it the requisite qualities. The imitation is said to he perfect, and the production has even the electric properties of amher. Ingenions manufacturers have even introduced into the suhstance foreign hodies, insects, etc., to make the similarity more striking. Natural amher requires a temperature of 285° to 287° C. to fuse it, while the imitation hecomes liquid at a much lower temperature.

The English Lanouage.—It is etated that a larger number and greater variety of ideas caa he conveyed with more exactness in a given numhei of words in the English language than most any other. This is strikingly ehown in the matter of telegraphy. It has heen demonstrated that for all telegraphic purpoeee, the Eaglieh language is from 25% to 33% cheaper than the French, German, or any other language.

The old proverh of the prophet, etc., ie illuetrated hy the inventors of thermometers. In England they use Fahrenheit'a thermometer, the invention of a German. In Germany, the thermometer of Reaumur, a Frenchman, is still the most common. In France, and in many other countriee, the Centigrade thermometer, which wae invented hy the Swede, Celsius, ie univerally adopted.

To Utilize Old Rubber.—The pieces are heated in contact with steam, when the eulphur is volatilized and the caoutchouc melte, and ie collected ae a liquid, nsed in preparing waterproof covers, etc.

Substitutes for Timber. — The growing scarcity of timbor appears to he attractiag the attention of visitors everywhsre to tho importaacs of devising substitutes. It is now stated that a houss could be huilt of glass blocks about as cheaply as of granite hlocks. Soms glass manufacturer should make the demoastration. But people who might live in snoh houses should ho carefal not to throw stoaes. It is also claimed that fire-proof houses can be built of cotton aad straw. Ia preparing thsse materials, raw cotton of iaferior quality, the scattered refage of plantations aad sweepiags of factories, are mixed and converted into a paste, which becomes hard as a stone, and thea is callsd architectural cottoa. It may bs made in large slabs, whersby ths huildiog of a house would he rapid in compsrison with the practice of layiag brick aftsr brick, aud at about one-third the cost. For ths other part, wheat straw is treated ia a way already knowa, and converted into pasteboard. The sheets thus prepsred ars soaked ia a solution, which hardens the fihsrs, and are then compressed uader euormous power into beams and boards of any reqnired size, and the effect of the soakiag is said to reader them difficult of combastion.

Letter Stamps.—The iagenuity of mankind in the manufacture of stamps has displayed itself ia 6,000 differsnt kiads. The museum at Berlin contains 5,000 specimens, half of which havs a European origia. Amoag the many kinds of decoration which havs been ased on stamps are coate of arms, stars, eagles, lions, the effigiee of five emperors, eighteen kings, three queeas, one graad duke, sevsral titled rulere of less raak, and maay presidents.

A cheap paint is made for hrick walls hy simply mixiag up good hydraulic cement ia water, aad applying with a whitewash brush. The natural tint is nentral and pleasing, but may readily be varied. This paiat cannot ho washed off hy storms nor peeled off hy the sun.

Asphaltum and India Rubber Varnish.—Dissolve India rubber in a small quantity of refiaed spirit of tar. It takes ahout six hours to dissolve. Asphaltum dissolves in the same vehicle in ahout the same time. This is preferahle to the old plan with mineral naphtha.

Good Health.

Death from a Tarantula Bite.—The Louisville *Courier Journal* of Oct. 12th, says: Oliver C. Waddell, who recently removed to this State from Texas, settliag along White river, in Stone county, was hitten yesterday hy a tarantnla. He was on a hunting expedition in the mountaias, and had camped under a large piae tree. Some time duriag the night the insect crawled in hetween the hlankete which enveloped him as he lay before the fire and hit him twice, once on the fiager and again on the arm near the elhow. He was awakeaed by a tingling sensation in that part of his body, and rousiag himself, discovered the cause and eucceeded in killiag the tarantula. It was as large as tbe hand of an ordinary man. Waddell's hand and arm hegan to swell rapidly, and before he could get to the nearest house, some four or five miles away, tho poison had spread apparently to all parts of his body. It was some time before he conld get medical skill, and when the physician arrived Waddell was found to he heyond hope. He lingered sometime, however, dying in the afternoon. The case is a singulnr one, from the fact that it proves that the tarantula is capahle of inflicting a death wound.

Wood-Splitting as a Remedy.—Some years eince, the wife of a wealthy Tennessee hanker, after trying a variety of remedies for dyspepsia and other ailments, consulted a physiciau noted for plain common sense and small doses of physic. He told her if she would split the wood for the family it would cure her. Woodhouses are unknown in Tennessee, or were at that time, and of course the wood-splitting must he done in the open air. The lady procured an axe suited to her hand, aud applied herself to the task, beginning with a few sticks each day, and increasing the number as she grew stronger. Gradually her ailments all disappeared, and her health hecame exuherant. When we knew her 25 years ago, with a house full of servants, and practically unlimited wealth at command, she still did all the wood-splitting for the family, and hid fair to douhle the half century in age she had already attained. Douhtless, taking hor exercise in the open air had quite as much to do with her recovery as the mere muscular lahor had.—*N. Y. Tribune.*

Comparative Longevity.—The Director of the Bureau of Statietice at Vienna has made eome intereeting reeearches concerning the longevity of women and men in Europe. He finds that out of 102,431 individuals who have passed the age of 30 yeare, 60,603 are women and only 42,628 are men. In Italy 241 alleged centennarian women are found for 141 men of that age.

A Good Disinfectant for the Mouth.—Permanganate of potaeh and hinoxide of hnrium, of each 24 grains, are to he ruhhed up into a mass, with eugar and glycerine, and divided into 144 lozengee. It is said that the uee of these will remove all disagreeahle odor from the breath.

The Improvement of Human Health.

In result of a somewhat large acquaintance with the facts held to iadicate ths state aad progress of "hnman health," I fear my testimony mnst he given to show that the improvement effected hy science coasists in a prolongation of tho passive endurance of life, rathsr than an extension of the period of trne vitality, or any increase of the opportnnity for good work aad real intellectual eujoyment. We may "live" loager, hut our lives are not either happier or more nseful for the excessive eaergy recently devoted to the conservation of health, or this inordinate and laborious means taken to avoid disease and death. It may, doubtless, he posaihle to raise humanity to the levsl of one of tbose scientific toys which approximate perpetual motioa, hut expend their whole force in moving themselves. Whether loagevity purchased at the price of passiag a life-time in running away from death would he worth having, I mnst leave to be determined hy the judgment of tbose who set a value on our so-called sanitary progress, which I, for ons, fail to recognize.

I thiak men were happier aad hetter, and lived nobler livee before the pursuit of health and the yearning for longevity hecame a craze, almost amountiag to madness. What to eat, driak and avoid, what to wear, where and how to live, by what means to avoid infection, to kesp off disease, and to escape death for a few weary and worried years, are questions which so engross the thoughts, if they do not emhitter the lives, of the mnltitude, that the proposition, "Is a saaitary life worth living?" has come to he a subject of serious contemplation, and one which the taxed and harassed community will sooaer or later he compelled to entertain.—*Dr. Granville, in a letter to the Spectator.*

A New Malarial Disease.—The Boston *Herald* shakes in anticipation of a great danger which menaces that city. It saye: "A terrible foe ie marching upon New Englaad. Hie name is Malaria. This mysterious disease is etill a pazzle to medical science, and no satisfactory cause can be assigaed for its origin, although varions theories are advanced. But we must face the alarming fact that the daager is upon us. It ie now acknowledged that, year hy year, the malarial zone is steadily spreading nortbward. Every summer it has attacked new districts whose saaitary conditions were hitherto unquestioned, and thus far it has scemed to come to etay. At the time of the Centennial it made its appearance at Philadelphia and scored its victims hy hundreds. Nearly all of New Jersey is now a den of malaria. It has intrenched itself aloag the Hudson and crossed iato western Vermont. New York City and the shores of Long Island sound are fearfally inflictcd. The past summer ite advance line has appeared in the Berkshire hills and in the Conaecticut valley, Lenox and Spriagfield heing especially marked. It has even come as near as Rhode Island, makiag its appearance in several districts of that State this season. Therefore it is time for us to be alive to tho daager before us."

Treatment of Nervous Shocks.—Tbe true way in all cases of shocks, whether from hurts or frights, is to unloosen every handage that could obstruct circulation, lay the person in an easy position, see that the feet are warm, the room well ventilated; let them lay (it may bs) for hours or even days, and "balmy sleep, Nature's sweet restorer," will do its work hetter than all the stimulants in creation. If, when consciousness return, there is sickness or headache, as the case generally is when the shock occurs soon after a meal—hecause it suspends digestion—the contents of the stomach ferment and sour, to prevent which a good drink of tepid water, and sometimes, the finger placed at the back of the tongue, will produce a vomit and the souring mass thus prevented from vitiating all the fluids. Let this he followed hy another sleep. If inflammation occurs, it can be stayed by a wet cloth, properly regulated as to temperaturo and duration to meet the case—the sense of comfort heing the rule of right.

Ivy Poison Remedy.—A correspondent of a contemporary says: "My hoys have heen great sufferers from ivy poison, one of them to an extent heyond description, aud visited hy many physicians two or three times a day without any apparent relief. An old Quaker hearing of the case, called to see him, and promised to cure him in 24 hours. He gathered a handful of 'life everlasting,' which grows in abundance in every pasture and roadside in the country. A strong tea was made of it, small quantities given from time to time as a drink, and the body freely hathed with it and kept wet. The relief was wonderful, and no one was more surprised than the doctor. In two days the hody of the hoy had recovered its natural proportions, and the fever and itching gone, and recovery fully eetahlished. It is claimed for thie herh that it curee ivy poison so that no return of it is to he dreaded.

Insect Life.—It is eetimated that there are five timee as many kinde of inecte as there are species of all other living thinge put together. The oak alone givee ehelter and support to 450 epecies of iasects, and 200 kiuds make their home in pine treee. In 1849, Alexander Von Humholdt eetimated that the numher of speciee preserved in collcotione was hetween 150,000 and 170,000, but ecientific men now say that there must be sometbing like 750,000 speoies,

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SAN FRANCISCO:
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Business Announcements.

A New Railroad—H. M. Yerington, Supt., Carson, Nev.
Tustin's Rotary Pulverizing Mill—W. I. Tustin, S. F.
Coals—R. W. Theobald, S. F.
Miners Want—New Almaden Mines, near San Jose, Cal.
Foreman Wanted—New Almaden Mines, near San Jose.
Dividend Notice—Standard Con. Mining Co., S. F.

Passing Events.

The miners from the higher mountain camps and from northern mines, are coming now to cities in milder climates to stay the winter out. The season generally has been pretty profitable, and hundreds of new mines have been found all over the country.

The Caesiar mines have shut down for the winter; as a rule, the miners have done better this year than was expected. One Chinese company took out $4,000 in six weeks.

The water company on the Comstock have prepared a large tank to furnish the water requisite to run the hydraulic pumps at the combination shafts with natural pressure. By the making of these arrangements, it would appear that the question was settled and in the near future the pumps would be run without the engines.

The reports that extensive and valuable deposits of petroleum have been discovered in Sweetwater county, Wyoming Territory, appear to be confirmed. A company has been formed under the name of the Rocky Mountain Oil Co., which last year made a number of experimental borings, with very encouraging results. The company at the present time have erected reservoirs capable of storing 1,500 barrels of oil per day.

The disbursements for mining dividends for the month of October amount to $649,833.

THE bullion yield of the Idaho mine, Grass Valley, this State, for the month of October (five weeks), was, in round numbers, $65,000, from which the usual monthly dividend of $7.50 per share, amounting to $23,250, will be paid. This will be the 147th regular monthly dividend paid by the mine, amounting to $3,078,300, out of a gross product of about $6,715,000.

The Hamilton Process.

In a recent issue of the PRESS we took occasion to comment on processes for reducing ores by means of baths of melted lead, giving at the time a brief statement of the various attempts in that direction. These remarks were called forth by the statement that a New York company had been formed for working ores by a process of a lead bath. Since then we have heard of more details, and find that the inventor, Walter Hamilton, proposes to work ores for $1 per ton, a thing which, with all due respect to Mr. Hamilton, we very much doubt his being able to do, as the simple handling looks as if it would cost that much. Of course the new (?) process is to leave nothing in the tailings. No new process ever did—when being experimented with. It is said that orders for 500 machines of capacity varying from 25 to 100 tons per day have been given, dependent, however, on the success of the works now in course of erection. As this process is intended to revolutionize the working of ores, we give a description of it, as taken from one of the Eastern journals, all of which seem to be in ecstacies over the new process. We can, however, most of us, recollect when we used to take a good deal for granted in the process way, but it was when we were all "green" on metallurgical subjects. Any miner can judge, after reading the description, whether it appears likely that ores can be worked for $1 per ton. It may be remarked, too, that the company controlling the process has 100,000 shares, and that the shares are for sale for $1 each:

"The ore to be reduced is first passed through the ordinary Blake crusher, after which it passes between a series of discs, which revolve together with a curious movement, and placed at varying distances above each other. This reduces the most refractory ore to a powder as fine as ordinary flour, in which condition it falls into a channel and is carried along an endless belt, a distance of perhaps 40 ft. Here it is taken up by elevators into the dust chamber and conveyed by a revolving screw shaft into a rotary furnace, constructed of iron and lined with fire-brick, where it is thoroughly heated, the furnace, by means of shafting, being kept continually revolving. Thence it is conveyed to the top part of a vacuum machine, in which it passes through a peculiar and entirely new process, and then passes into a bath of 25 tons of molten lead. From this point it is made to pass between a curious system of plates, whereby the ore is brought into intimate and absolute contact with every part of the lead, which occupies a little over one minute's time. The actual capacity of this portion of the machine is 25 tons, but as the lead becomes impregnated with the precious metals a portion of the base bullion is drawn off, and more lead is supplied by a peculiar automatic arrangement as rapidly as required. Another peculiarity of this part of the process is the fact that after the precious metals are extracted from the lead the latter is run into pigs and used over again, thus saving any waste whatever.

"In working sulphureted ores a peculiarly manufactured gas is run into one portion of the machine and carries off the sulphur, thus leaving it free from that substance when it reaches the bath, and saving the necessity of extracting it afterward. One of the greatest features of the process is, that from the time the ore is placed into the crusher until it leaves the machine a perfect amalgam it is not handled, and hence a great saving in labor is effected. Besides this, after it enters the rotary furnace it is never allowed to cool, and here again comes in a saving of fuel.

"The entire machinery necessary to the perfection of the process is built within a space of 52x30 ft., including the spaces between the furnaces, which are built of brick, and so formed as to be capable of furnishing all the heat required, mechanical devices enabling it to be directed to any point where it is most needed. The works have been built in the most substantial manner on a foundation of seven feet of solid masonry. Their capacity will be at least 100 tons per day, and all the power required to run them is a fifteen-horse-power engine. They are expected to be at once put in active operation. The company invites mining companies to send it samples of their ores in quantities of not less than five tons, so that they may satisfy themselves of the merits of the process."

WHITE PINE AGAIN.—It is reported that in the Eberhardt tunnel, some of the famously rich ore which once astonished everyone, has been found near the North Aurora line. Some of it will assay $20,000 to the ton. No regular body has yet been encountered, but the existence of these bunches is very encouraging, especially as they are met with at a depth of something like 1,000 ft. from the surface. White Pine may, after all, witness another boom.

UP at Silver Reef, Utah, work is being pushed vigorously at all the mines, and surplus ore is rapidly accumulating at the different mills. The outlook is decidedly encouraging for a most prosperous season, and there is every indication of a largely increased output. The improvement noticeable in the quality of the ore as greater depth is attained is not the least gratifying feature.

Artesian Well Tubes.

The principal difficulty in the ordinary mode of sinking and tubing artesian wells is to force the pipe in tubing of uniform size down to any considerable depth, owing to the lateral pressure of the surrounding earth, and the usual result is, at a depth of from 100 to 200 ft., the lateral pressure is so great that the pipe cannot be moved down with all the force available. The only alternative is to put down a smaller pipe inside of the first, and repeat the same as often as the pipe gets stuck fast, and by that mode, if the well should reach a depth of 500 or 600 ft., it would be of little practical value as the diameter of the pipe at the bottom would be so small.

Benjamin Roberts, of Alameda, has obtained a patent through the MINING AND SCIENTIFIC PRESS Patent Agency for an improvement which is designed to overcome this obstacle. By his improved method he makes the well tubing conical and inclined about two or three inches to the 100 ft., with the large end at the bottom, by which means he not only avoids the difficulty of getting the pipe stuck fast and held by the lateral pressure of the surrounding earth, but utilizes the lateral pressure in forcing the pipe down—very little force more than the weight of the pipe and the lateral pressure—where the earth is excavated inside and underneath the pipe.

A well say of 1,000 ft. would be started with pipe 30 inches in diameter, and inclined two inches to the 100 ft. it would terminate at the top with pipe 10 inches diameter, which practically would be equal in value to a well 30 inches in diameter the entire depth, and would cost less; and further, it would be impossible to sink a well 1,000 ft. of 30 inch diameter of uniform size pipe. A well constructed with conical pipe as proposed, would be like receiving the water into the large end of the funnel instead of the small end, as by the old mode.

The boring or excavating of the well for the cement pipe can be done by hand or steam power, and with any of the well-known tools. The inventor prefers sand pumps constructed of half-inch boiler plate, armed on the bottom with heavy barbed irons for picking or loosening the earth or rock, the whole weighing 500 or 600 lbs., and worked by a rope attached to a hoisting engine alternately hoisting and letting it drop eight or ten ft., which would loosen the earth and fill the sand pump with the loosened material. The sand pump would be constantly changed in position, so that it would not strike in the same place, and spring tools would be used to cut away the earth from under the edge of the pipe.

Each inner section extends about half way into the outside section below, and is secured to it. The upper end projects out, so that the next section above slopes over it. The inner pipes all abut, so that the tube is double throughout its whole length, and has the strength of both tubes.

New Map of Sinaloa.

We had an opportunity this week, of examining the drawings for a new and complete map of the State of Sinaloa, Mexico, by Frederick G. Weidner, topographical and mining engineer, who arrived in this city a few days ago from Mexico. It consists of three special maps or sections, viz., a topographical, an ethnographic-linguistical, and a geological one. This latter, the first of the class we have seen of Mexico, shows all the mining districts of that State and adjoining parts of Durango, Sonora and Chihuahua, with their respective topographical and geological formation. The map, when published, will be accompanied by a pamphlet that explains the location of the most celebrated mines, and contains valuable information on general statistics, geology and meteorology. The map is to be issued by subscription, and lists are at the State Mining Bureau, Sutter street, and with the Secretary of the Geographical Society, of this city. Mr. Weidner is at 606 Montgomery street, room 44, and those desirous of any information concerning the northern part of Mexico, will do well to call on him. Mr. Weidner, a graduate of Freiberg, went to Mexico in 1850, and has been living since mostly in the northern States of our sister republic, viz., Nuevo-Leon, Coahuila, Durango and Sinaloa. In all these States he was appointed successively, by the local governments, State Engineer. He has been engaged in surveying and mapping mines, and as he traveled through all that country, brought to light and explored many of the hidden mineral deposits, and other natural resources, and succeeded in making the topographical and geological maps of those States. He is an active member of the Mexican Geographical and Natural History Societies.

IMPORTANT and extensive improvements are now going on at the Parrot smelter, Montana. Its present capacity, with but one reverberatory furnace, is only 12 tons daily; but such is the vast amount of pay ore in the Parrot mine, that it has been decided to increase the smelting capacity of the works. With this end in view, the building of four new reverberatory furnaces is now progressing, which, when completed, will give the smelter a daily capacity of 50 tons.

Mechanic Arts.

The Encouragement of Home Industries.

An attempt is being made in this city to organize a series of lectures for mechanics, on practical subjects, by practical men, and on Thursday evening of last week a number of persons met at Capt. McNevin's Nautical school, corner Beale and Harrison streets, to hear the first lecture. It consisted really of a plain talk by Mr. Irving M. Scott, introductory to the course, explaining the objects, and what was hoped to be accomplished. Mr. Scott's remarks were apt and telling, and were frequently applauded; and we have no doubt many of our readers, unable to be present, will be glad to read what was said:

Every mechanic in San Francisco has felt the need of an organization in which elementary principles can, at least, be taught. We need more friction here. San Francisco ought to get rid of her petty jealousies, and her citizens ought to labor, to some extent, for a common good.

If any one man engaged in the mechanical arts knows more than his neighbor, let us shake hands and get to know him. We will make our bread and butter easier when we know the best method of doing work. I have for years thought that the Mechanics' Institute ought to establish schools and classes. This has been beyond the control of the Institute, however, and they have put off from year to year what now Capt. McNevin comes to the front to do. And I say, all honor to him who labors in such a direction.

In all branches here there are plenty of men to teach—men of ripe experience and judgment. Yet our young mechanics do not have the advantage of our knowledge till it comes out in a book or pamphlet, and these do not come out frequently enough. All over the older countries are lots of institutions where subjects are discussed openly. No man feels above his neighbor there so much as to refuse to share his knowledge. We ought to follow this example here.

We must grow here, and in order to do this must foster every trade. We have here men as eminent in shipbuilding as anywhere, but we lack some facilities. Why encourage ship owners to go abroad to buy ships? All we need in this city is to manufacture the material here. The commerce of San Francisco is in its infancy. It is not so very many years ago that we had to go to Oakland in a whitehall boat. Now great ferry steamers for a few cents carry us there day or night, smoothly and quickly. Our commerce to-day is in the whitehall stage, compared to the future awaiting it.

All down the coast of South America, the islands of the Pacific, Japan, and China, are opportunities for trade with us. We must have dry-docks here equipped and managed, so that the trading vessels will spend their money among our mechanics. We ought to teach our young mechanics what our future is to be. That man is a worthy and good citizen who inaugurates a series of lectures such as we indicate, as it is a step towards the end.

But this is only one branch. As long as food is too plentiful in one country and too scarce in another, so long will engineers be required to assist in equalizing this production and supply.

You may go into the question of mechanic arts, but I tell you that I believe that mining is the only industry that has been loyal to the mechanic arts. All its wants are supplied at home. Agriculture goes abroad for her reapers, mowers, threshers and other implements. All these are imported, so that agriculture has done but little for the mechanic arts here comparatively. That field is almost virgin soil. Some young mechanics will take up these branches and have the money spent with us that now goes away.

The tools used in the mechanic arts can now, some of them, be made here. A tool company has been organized, and this field will soon be fully filled.

I went, the other day, into a linseed oil factory, and found that the farmer who raises the plant, only sells the seed. He does not retain the fiber. Who shall start the factory to utilize that? There is a demand and market for the oil; make one for the fiber, too.

The rope works of this city, which I recently visited, have tools there which would employ a foundry a year to make; but not a pound was made here. Not a pound of the raw material was grown here. The proprietor told me he needed a new and a larger engine. He had had this one 17 years. It was built in Providence, R. I., and had done such good work, that he thought he ought to go back to Providence to get the new one. I told him Providence ought to work up some of that hemp for him if he did.

You all know how slight a proportion of the mechanic arts labor is employed at home. Our boys and girls must find the fields all unoccupied, as we did when we came to this country. They will have to make new fields, and let us help them all we can with our advice and experience, at least.

The average product of man's labor here is greater than in most places, because of the mildness of the climate. I visited the old world not long ago, and I really wish I could convey to you an idea of the advantages you have in California.

In Europe every little wisp of straw is of value, because it has a value, and necessity is

tha spur behind the people, not economy. Some ona makes his living out nf the wisps of straw. If yon untie a package and throw away the paper and string in your room, and afterwards want the string or paper, they will charge you for it. You can be more free in a young country lika this, but Europe has had ita lines of ownership drawn for centuries. You are in a land of plenty. You can lay by for old ages by industry. enough for your purposes. We want to start and develop all the new industries we can, and the first step is to educate the men to carry them on.

During the 22 years in which I have been engagad in the foundry business in this city, every man of industry whom I have known has done well. My apprentices are all at work at one place and another around the country. As soon as they have experience, my neighbors aro always glad to have them, and all these lads are well-to-do. No mechanics of industrious habits are ever out of work.

In England, I went in a stranger to an institution where certain discussions were being carried on. I felt perfectly at home. There were the first engineers of England reading papers on good subjects. Afterwards men got up and discussed the subjects, telling how their experiences led to different conclusions. They were all in friendly communion. The result was, I had the experience of the 20, or 30, or 40 years of work of these men. This is the only case I remember where I got something for nothing.

Not long a man came into my office and said we did not know how to make boilers. He had heard of some new improvements not in use here and told me one of them. I turned to my desk and took up a pamphlet describing the system with all its details. It was an English book and the discovery had already been heralded. Suppose they had bottled up that information and not told us. We could not have had the benefit of their wide experience.

When the big steam yacht *Livadia* was tried every engineer in the United States knew all about her as well as if he had seen her. Knew of the slip of the propeller, speed, coal, whether she rolled or not, etc. Every engineer knew that the steel boilers failed, and why. All this experience we had at the expense of the Czar of Russia.

Why not build up an institution here to exchange views. We must raise our own mechanics here. We used to import them, because there were no young men here.

I do not know much about ships, but I would take a contract to build one, simply because I know a man who can do it. In Baltimore, where I came from, they are very conservative. One follows the other's business. The grandfather, the father and the son will be in the same store, and there is no advance for the son until the grandfather steps out and the father steps to the front. They are too conservative. This city, though it has advantages, never took any lead in mechanic arts. There are no grandfathers here, and each one may move upward independently.

Let us help everyone, and ask him to tell us what he knows.

Did you ever hear of mining stocks? We have been going through an era of depression in mining stocks, and it has been really a godsend to us; but let us have no more kite flying and no more paper. Let us have 40 shops where we now have one. Let us shut out all importation. Let us put our intelligence into lectures and into papers, and let us organize all our industries and forbear speculation.

Every Thursday you will hear in this room a lecture on some subject. You will be privileged to come here, and if the room is not large enough we will get a larger one. See if we cannot organize a true mechanics' institute to help our young mechanics.

When Rome was in her glory the proudest boast of her citizens was that they were Roman citizens, and this fact gave them a fellowship with the leaders of the world. Let us be so true to the mechanic arts that when one comes to the door and says, "I am a mechanic," let him come forward and have any privilege that is held within the gift of the State.

Mr. Richards, of the San Francisco Tool Works was unexpectedly called upon to make some remarks. He said there was not much to be added to what was already so well said by Mr. Scott. He gave some account of what had been accomplished by English institutes and by the Franklin Institute in the East, the only one like those in Europe. He thought this latter institute had contributed mainly to the mechanical progress of the city in which it is situated, and made it what it was. Mr. Richards paid a compliment to the amount of engineering knowledge he found in California, and said it was a most remarkable fact that there was no institute such as this. He promised to prepare a paper before long.

Mr. Dickie, of the Risdon Iron Works, said this was the first revival meeting he had attended for some time; and he noticed that, like all revivals, it began with a praise service. As regards our climate, Mr. Dickie differed from most people in his estimate of its advantages. He thought mechanic arts flourished better in inclement climates. A place with a bad climate will outstrip others with the advantages of position. He instanced Liverpool, with its docks which were born of the necessities of the location; Aberdeen, where the miserable weather and short winter days made them put up big enclosures and buildings. It required dogged perseverance to overcome the difficulties in such places, and this fostered the industries. Mr. Dickie promised to read a paper on "Marine Engineering on the Pacific Coast." In this, his specialty, he hoped to interest the audience. He told those present not to expect too much of these lectures. If the lecturers gave the men a start to set them thinking for themselves, it is all that can be done. If this only is accomplished the lecturers will do great good.

Levee Building with Slickens.

[Written for the PRESS by R. G. SNEATH.]

I had the pleasure of visiting Marysville and vicinity, and many of the hydraulic mines, with the committee lately appointed by our citizens for the purpose of examining into this great question which is now absorbing the attention of the people of the whole State; and although an old resident, and somewhat familiar with the situation, I was surprised at the large amount of damage done the agriculturists in that vicinity.

Much of this damage, especially that on the low bottom lands, cannot fairly be charged to hydraulic mining, as it happened from 1857 to 1862, which was before the Giant was invented, I believe, and when that class of mining was in its infancy, every year, however, has increased the spread of the debris until now, and must increase unless some remedy is applied, even if mining of all kinds should cease altogether, as the mountain streams, gulches and valleys are choking full of gravel, sand and slickens, and must come down to the lower valleys, if not stopped, and for this reason it is well that the farmer should look to the miner to assist in stopping this flow, for the farmer cannot do it unaided.

Much has been said by the newspapers of late concerning the extent of the damage, and very little in relation to any remedy. The papers of the agricultural districts claim that the miners shall stop until they can impound their tailing; and the miners claim that they must continue, in order to get the gold to build the necessary impounding dams.

Both interests are very large, and to kill or cripple either, would result in great injury to the whole State. Mining seems to be in its infancy, and may yet prove to be much the more important industry of the State; and the very farmers, that years ago, as miners, helped to fill the mountain streams with debris that is now coming down upon them, may yet abandon their farms, after wearing them out in the present fashion, say in 15 or 20 years, and return to the mountains in search of gold, as a more profitable employment and a more permanent investment.

Both interests should be protected and harmonized, and the great question is, *how can it be done at an expense that will be justifiable and in time to save further destruction.*

I believe that much of the demoralization of our people on this subject has been caused by the large outlay already without much perceptible benefit, and the statements from prominent sources that it will require at least $5,000,000 the first year and about $1,000,000 annually thereafter to impound the debris and clear the navigable rivers sufficient for navigation. This would be impracticable, as no such sums could be raised.

I will now give you the conclusion I came to after looking over and considering the matter of the remedy:

1. I would throw up stone dams in the canyons of the streams, in the mountains, as near the mines as practicable, holding what debris there is in the beds now, and what may be put in hereafter. This is admitted practicable, and I learn that the majority of the hydraulic mining companies are willing to attend to it at once, if all the lawsuits against them are withdrawn.

2. To empound and utilize the fine sediment, or slickens, say, take the Yuba river as an example, I would build a canal or ditch on both sides of the Yuba, taking out the water and slickens at the foothills about 14 miles above Marysville, and large enough to carry all the water and slickens flowing in that river during the dry season, and with this slickens, and what could be saved in the winter season, I would build large, broad levees along the river on both sides, and around Marysville, so as to protect it from the possibility of any flood, raise the whole town if desired, and then spread it after that, over the red, gravelly, poverty-stricken land near the foothills, and generally designated as sheep pasture, or continue it down to the overflowed lands of the lower valleys.

Before going further, I will cite the Cherokee or Spring Valley hydraulic mines and canal as an illustration. The slickens from this mine is now carried for nearly 40 miles in a canal 500 to 600 ft. wide, and it is receiving the deposit along its line to the extent of building it up rapidly, and delivering the water free from sediment at its terminus. This company has customers also for the slickens at various points on its line. Farmers find that if it is mixed with the adobe soil, that the latter becomes friable, and can then be cultivated at any season of the year; and evidence was furnished from reliable sources that pure slickens has and will produce a fair crop of both wheat and barley, and I saw a good stand of corn and alfalfa growing in slickens 16 inches deep on the bottoms of Bear river.

I have also seen the building of a large addition to the dam of the Oakland Water Works Co., back of San Leandro, upon the same principle as the Cherokee Works—that is, the material from which the dam was built was carried in solution to the point needed, and there deposited by settling. The earth having been thrown into a ditch of water a considerable distance from the dam that it might be transported economically.

Now, if the miners will continue to furnish this slickens free of cost and in large quantities during the dry season, when it may all be utilized, I do not see why all of the levees required on the upper rivers may not be made from it, all the low lands filled in, all the foothill poor lands accessible redeemed, and water for irrigation purposes furnished plentifully at slight cost, and at an elevation sufficient to furnish power, and made applicable by gravitation.

I feel confident that slickens will in turn be made to do all these things, and at a very moderate expense, if commenced on a small scale and allowed to work its way along; and judging from the quantity now in the rivers of the north, there will be an ample supply for all, in time.

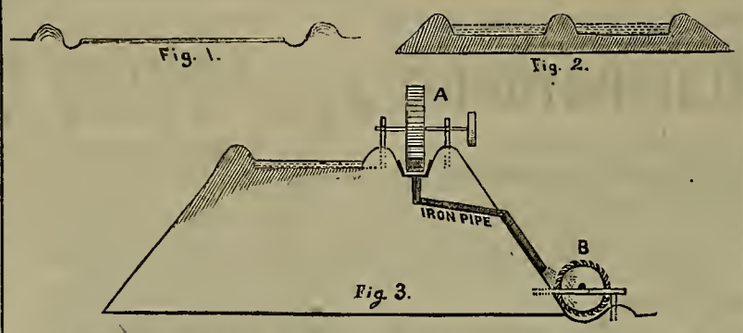

DIAGRAM SHOWING PROPOSED LEVEE BUILDING WITH SLICKENS.

To those not acquainted with the nature of slickens, I will say that it is about half light colored mud, and the other half water; and that on a moderate grade, all the mud will settle on the bottom in a distance traveled of about 40 miles, so that the deposit of the first mile traveled would be much more than the next, and would continue thus until the grade it established increased the velocity of the water and lessened the deposit, so the second mile would in turn receive the larger deposit; and each succeeding mile would thus receive its quota.

Between the foothills and Marysville, the Yuba river and bottom land has been filled with debris, and is now a waste covered with willows to the extent of about ten miles long and two miles wide—in all, say 22 square miles. These willows cause the rapid deposition of the debris, and this space will perhaps hold all that may escape over the miners' dams, or that may not be caught in the side canals, for many years to come; so the remaining difficulty will be to clear the navigable streams below, that navigation will be possible at all seasons, and the channels enlarged, that the floods of winter may have a free outlet. And in this, in the interests of commerce and navigation, I think we can rely on Congressional aid largely, should the people of this State act harmoniously in asking for an appropriation; and I would suggest that, as Congress has done but little in keeping our rivers navigable, that $500,000 annually, for few a years, would not be considered extravagant, considering the situation.

This money I would expend in dredging the rivers and in building broad levees along the principal streams.

Dredging is now done so cheaply that the task will not be so great as many would imagine. Machines are now in operation on this coast that will take the sediment out of the river beds and place it on the banks from 100 to 300 ft distant from the banks, at one cent per cubic yard, and which material is the very best obtainable for levees, and thus forming a wide, solid embankment that would be an ark of safety to those living along the rivers, on which both man and beast might congregate in time of flood.

To dredge along the banks of the Sacramento, say for one mile or 1,760 yards, 5 yards deep and 30 yards wide, would cost $2,640, at the rate of one cent per cubic yard; and it would take about one month's time with one machine. Now, with several machines it would require but a few years to lift the principal portion of the debris out of the streams, and at the same time secure most of the agricultural land from overflow, if not all in time, by the construction of immense levees, and the deepening of the channels.

The owners of the lands reclaimed could well afford to contribute largely toward this work, and the State at large, or that portion especially benefited, should also do their portion and thus all combining a substantial work could be accomplished that would not only save a large territory from destruction, but would reclaim an immense area of land now of no value.

I believe that the value of "slickens" as applied to adobe land, is imperfectly understood, and that when it may come into more general use, that it will be found to be of great value in tempering that vicious soil to the consistency of garden land.

And who can estimate the value to the country of a grand canal on each side of the principal rivers of the State, with an elevation sufficient to irrigate the adjoining lands throughout, and furnish motive power sufficient for the purposes of each and every farm!

In conclusion, I would suggest that the whole debris question should be referred to a committee large enough to represent the several interests fairly, and let them prepare a detailed plan, in connection with competent engineers, that would harmonize the many interests involved, and allow a continued prosperity to all.

Explanation of Diagrams.

The diagrams on this page show the manner in which levees can be built with slickens, and the flow of water used to furnish power for useful purposes and for irrigation.

Fig. 1 shows the beginning of the levee. After the canal has reached moderately sloping land, plow up two ridges, about 100 ft. apart, and confine the slickens and water between them.

Fig. 2 shows the deposit several feet deep. The center division will allow the slickens to be diverted to either side alternately, that the sediment may dry enough to sustain horses and plows, by which the embankments can be raised from the inside from time to time.

Fig. 3 shows the levee and canal completed—say from 15 to 25 ft.—high; the ditch on the right made lower than the canal, to receive its water by crosscuts and from near the surface of the larger canal. After being used as power (on a plain paddle wheel, marked *A* on the top, or on a hurdy-gurdy, like *B* at the bottom), the water can be dropped in the ditch at the base, marked *C*, and conveyed for irrigation where needed. The paddle wheel should be boxed in at its sides, that the full force of the water would apply. The slope of the sides of the levee should be much greater than shown on the diagram, that a sod might be grown thereon.

The Debris Injunction.

On Wednesday, by request of Judge Keyser, Judge H. A. Mayhew, of Tehama, presided in the Superior Court at Marysville, to hear a motion in the case of the City of Marysville vs. the North Bloomfield Gravel Mining Company et al. George Cadwalader and Judge Craddock appeared for the plaintiff; the defendants were not represented. The plaintiff's counsel filed affidavits showing that certain of the defendants had been violating the injunction issued by Judge Keyser, restraining them from suffering debris to flow into the Yuba river or its tributaries. Judge Mayhew, on this showing, made an order requiring the said defendants to appear in the Superior Court at Marysville, on the 25th instant, and show cause why they should not be punished for contempt. The defendants named in the order are the Eureka Lake and Yuba canal company, Boston mining company, the Milton mining company, the China mining company, and the North Bloomfield mining company, all operating in Nevada county. The order commands the Sheriff of Nevada county to proceed forthwith to the mines of the said mining companies of the defendants and close down and shut off the water therefrom, and keep the same closed down and the waters thereof shut off until the further order of the court. In the case of the Eureka Lake and Yuba canal company, the order provides that if R. McMurray, managing agent of said company, cannot be found, sufficient service of order shall consist in posting a copy of the same in a conspicuous place on the mine of the said company, and serving a copy on the attorney for the said defendant. McMurray has hitherto evaded service of the injunction, and is the sole representative in this State of the Eureka Co.

THE White Pine *News* (Cherry Creek, Nev.) says: The railroad survey made within a hundred yards of our town limits, and the heavy grading now being done within four miles of us, and on other points on the line, are the best evidence of the road's speedy completion. When open to traffic it will give us direct communication east and west, and will of course greatly reduce the cost of mining in our district.

T. H. ROONEY, formerly superintendent of the Sierra Nevada mine and Union shaft, has been appointed superintendent of the Utah. A. G. McKenzie, formerly of the Utah, takes Mr. Rooney's place as superintendent of the Sierra Nevada and Union shaft.

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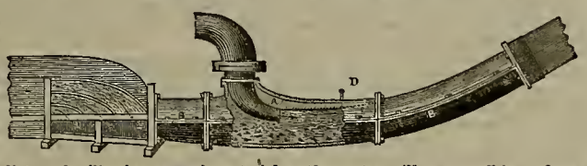

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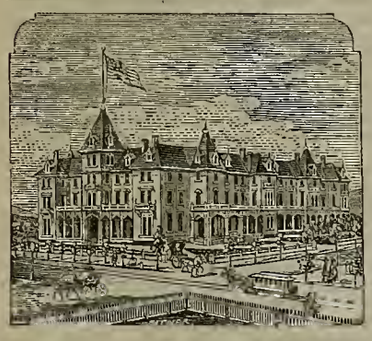

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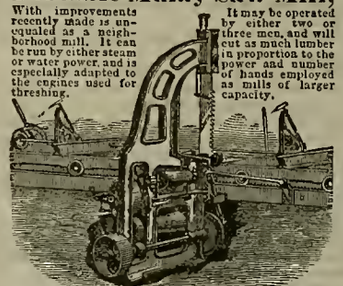

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JOHN TAYLOR & CO.,
IMPORTERS OF AND DEALERS IN
Assayers' Materials,
MINE and MILL SUPPLIES,
CHEMICAL APPARATUS AND CHEMICALS, DRUGGISTS' GLASSWARE AND SUNDRIES, Etc.
118 and 120 Market Street, and 15 and 17 California St., San Francisco.
We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.
Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
☞Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.
JOHN TAYLOR & CO.

ALEX. DEL MAR,
Mining Engineer,
Late Director of the United States Bureau of Statistics Mining Commissioner for the United States Monetary Commission, etc., No. 216 Sansome St., San Francisco. Cable address—"Del Mar, San Francisco." Branch Office, 61 Broadway, New York. Cable address—"Del Mar, New York." London Agency: H. Stodes & Co, 24 A, Southwark St., S. E. Cable address—"Del Mar, London." Paris Agency: J. H. McDonald & Co., 13 Rue St. Lazare. Cable address—"Del Mar, Paris."

G. KUSTEL. H. KUSTEL.
METALLURGICAL WORKS,
318 Pine St., (Basement),
Corner of Leidesdorff Street, - SAN FRANCISCO
Ores Sampled and Assayed, and Tests Made by any Process.
Assaying and Analysis of Ores, Minerals and Waters.
Mines examined and reported on.
Practical Instruction given in Treating Ores by approved processes.
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Mining Engineers and Metallurgists

OTTOKAR HOFMANN,
(Of the Firm of Hofmann Bros.)
Metallurgist and Mining Engineer.
Erection of Leaching and Chlorination Works a speciality
Working Tests and Reports made.
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H. DEGROOT, Sr. F. E. BIGRE. H. DEGROOT, JR.
DeGROOT, BIGRE & CO.,
Mining Engineers & Assayers,
Examination of and Reports on Mines a Specialty.
No. 331 Montgomery Street, Room 28.
SAN FRANCISCO.

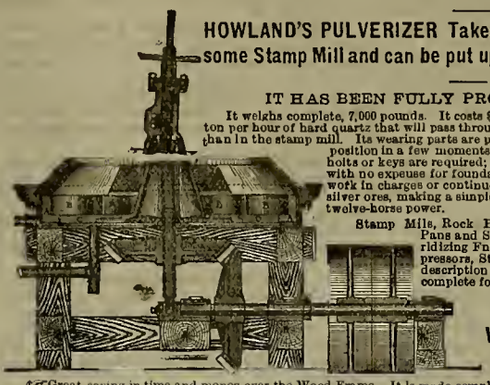
NOTICE.

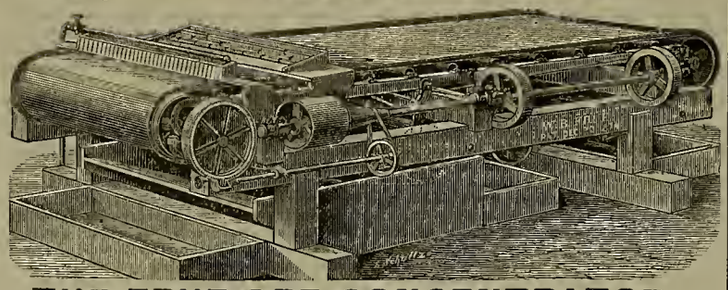
The office of the STETEFELDT FURNACE CO., having been removed to New York, parties wishing to obtain information in San Francisco about the Stetefeldt Furnace will apply to Messrs. Prescott, Scott & Co., Union Iron Works, San Francisco. C. A. STETEFELDT.

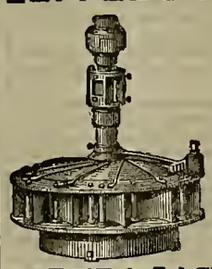
SHEET IRON PIPE.

FRANCIS SMITH & CO.,
Manufacturers of
THE PATENT CHANNEL IRON WHEELBARROWS.
THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand
SHEET IRON PIPE.
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Arteslan Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.
Office and Manufactory, 130 Beale Street, San Francisco.

SHEET IRON PIPE.

MOREY & SPERRY,
MANUFACTURERS OF
Gold and Silver Grinding and Amalgamating Machinery

HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.
IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill. It requires twelve-horse power.
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill supplies Iron Work complete for Wood Frames, also
SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.
☞Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
MOREY & SPERRY—Warerooms, 92 and 94 Liberty St., N. Y.

$1,000 CHALLENGE!

THE FRUE ORE CONCENTRATOR.
Nearly 300 are now in use, giving entire satisfaction. Awarded First Premium and Silver Medal at the Industrial Fair for 1880 of the Mechanics' Institute of San Francisco, Cal.
Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.
We challenge any other Concentrator in use for a fair and impartial competitive trial, side by side, for stakes of $1,000 each, and we mean business.
☞A machine with all improvements can be seen in working order and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont street.
ADAMS & CARTER, Agents, Room 7 No. 109 California Street, S. F.

LEFFEL'S IMPROVED WATER WHEEL.

PRICES REDUCED!
PATENTS REISSUED 1868.
The "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.
Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
JAMES LEFFEL & CO., Springfield, Ohio, and 110 Liberty St., N. Y. City.
PARKE & LACY, Sole Agents, 21 and 23 Fremont St., S. F.

GIANT POWDER
MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS.
Nos. ONE, TWO and THREE.
Stronger, Better and Safer than any other High Explosive
Judson Powder
IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.
It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞Triple Force Caps and all Grades of Fuse.
BANDMANN, NIELSEN & CO.,
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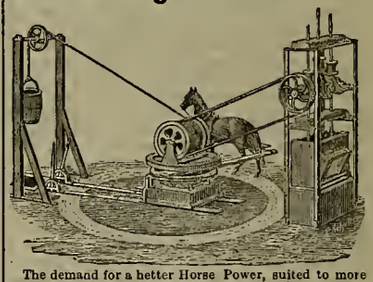
SELBY SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.
Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

Mines and Mining Properties Solicited for Sale.
I have unexampled facilities for rapidly placing Mines and Mining Properties, and claims of
Ascertained Value
Upon the Market, through my Branch Offices in
NEW YORK, BOSTON, PHILADELPHIA, CHICAGO, ST. LOUIS, LONDON, ENGLAND.
OWNERS OF
Meritorious Mines and Prospectors
WHO HAVE NOT THE MEANS TO PROPERLY DEVELOP THE SAME MAY FIND A PURCHASER THROUGH MY OFFICE.
If You Have a GOOD MINE, or a GOOD PROSPECT for sale, apply to me in person or by letter.
JAMES A. MARS,
45 to 49 Merchants' Exchange, California St
SAN FRANCISCO, CAL.
REFERENCES:
London and San Francisco Bank, S. F., Cal.
Anglo-Californian Bank, S. F., Cal.
John J. Valentine, Superintendent Wells, Fargo & Co.'s Express, S. F., Cal.
J. B. Haggin, Capitalist, S. F., Cal.
Louis A. Garnett, Capitalist, S. F., Cal.
Daniel Meyer, Capitalist, S. F.
Prof. Thos. Price, M. E., S. F., Cal.

New Mining Horse Power.

The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
Agent and Manufacturer of Mining Machinery
38 and 40 Main St., S. F.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," U. S. and Foreign Patent Agents.

FOR THE WEEK ENDING OCTOBER 25, 1881.

248,630.—TOILET ARTICLE—Arment & Scott, Dayton, W. T.

248,565.—APPARATUS FOR AMALGAMATING ORES—M. P. Boss, Oakland, Cal.

248,633.—HEADER—Ira H. Bradshaw, San Leandro, Cal.

248,664.—ARTESIAN WELLS—Benj. R. Norton, Alameda, Cal.

248,787.—ROCK DRILLING MACHINE—H. F. Parsons, S. F.

248,605.—ADDING MACHINE—Wm. Perry, Santa Barbara, Cal.

248,791.—QUARTZ MILL—A. E. Redstone, Oakland, Cal.

248,805.—COMBINED BLOWER, LIFTER AND GAS LIGHTER—R. W. Silvey, S. F.

248,653.—DERRICK WAGON—W. H. Worth, Petaluma, Cal.

248,642.—WATER JACKET FOR SMELTING FURNACE—Geo. W. Fogg, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

DERRICK WAGONS.—Wm. H. Worth, Petaluma. No. 248,683. Dated Oct. 25th. This patent relates to that class of agricultural implements known as derrick wagons, and more especially to certain improvements in the means for operating the winding drums or spools, whereby the independent opposite lifting forks are lowered with facility by the operation of a single lever. The invention consists in two drums or spools loosely placed upon a shaft supported appropriately upon the frame of the wagon. The inner ends of these spools are adapted to receive a conical clutch, which is upon a feather on the shaft, between the spools, and which is pushed to either side by a proper lever, and is forced ultimately into the ends of the spools, causing them to revolve by friction. A suitable braking device is provided for stopping the operation of either spool, when necessary.

HEADER.—Ira H. Bradshaw, San Leandro. Dated Oct. 25, 1881. No. 248,633. This invention relates to certain improvements in the construction of headers, and it consists: First, in the employment of iron having an H section peculiarly united to form the frame of the machine; secondly, in a novel construction of the sickle bar, and thirdly, in certain details of construction. It further consists in a novel means for raising and depressing the sickle bar.

THE WESTON ELECTRIC LIGHT.—Exhibitions in this light have been given this week at the factory of the California Electrical Works. The Weston generator is of the celebrated Siemens pattern, modified very successfully by Weston. Where the Brush light requires a full speed, or about 900 revolutions of the armature to produce a light of nominally 2,000 candle power, the same light is said to be produced by from 500 to 600 revolutions in the Weston. The lesser number of revolutions prevents heating and the armature being smaller in diameter necessarily takes less power. The oiling on the commentator of the Weston generator is also reduced to a minimum and offers very little friction and correspondingly small wear and tear. The light was shown with three different styles of globes, opaque, ground all over, half ground and half clear, and with a reflector without a globe. While the light in all was a pleasant one, soft, steady, bright and mellow, that given through the globe of half ground glass seemed to give the most satisfaction. The lower half of the globe is ground, breaking the intensity of the light below, and spreading the full power above and around. It is said that the C. P. R. R. company will adopt this light at the new depot on Oakland pier.

REPORTS to the Navy Department say Commodore Shufeldt is cruising on the coast of China in the yacht of the Viceroy, Li Hung, with two Chinese naval officers, for the purpose of locating naval stations. He hopes to organize an Imperial system of naval administration to take the place of the present barbaric method of governing, equipping and paying the Chinese naval service. Lieutenant Mannix has been made a Mandarin.

THE Visalia *Delta* says: To give an idea of the wheat production in the Mussel Slough section this season, we shall state that one out of the seven firms buying wheat at Hanford has, since the 1st of July last, purchased 7,000 tons of wheat, 4,000 tons of which have been shipped to the bay, and 3,000 tons are still held by this firm. Where is the section of the same area that can beat this?

THE question of the independence of Canada is being discussed in the Dominion.

What They Say About the Comstock in New York.

[From our Regular Correspondent.]

EDITORS PRESS:—To show you that the state of the speculative market influences the judgment of stock operators as to the merit of the mines just as completely here as in San Francisco, I quote the following paragraph from the New York *Evening Post* of the 24th inst., which may be taken as expressing the average public sentiment at the present time:

"The San Francisco market for mining shares has shown weakness and a steady decline this last few days, especially in the northern Comstocks, where the alleged new bonanza exists. Every artifice known to stock manipulators has been tried to tone up the market; all have failed. The upper part of the lode has been pretty thoroughly worked out and no profitable ores now exist above the heated levels. It may be that vast ore bodies might be found below the present works if it were possible to go deeper. But with the thermometer at 160°, and the heat rapidly increasing at every foot of depth gained, there is little prospect of finding them in this generation. In portions of the California and Con. Virginia mines the heat caused an entire stoppage of work some weeks since, but by means of fans and blowers sufficient air has been introduced to allow a resumption of operations. The Bank of California is gradually withdrawing from all connection with mining operations."

Only a few weeks ago, when the incipient and disappointing Sierra Nevada boom was making itself felt here, the tone of the press and of the general public was altogether different. Highly exaggerated accounts of strikes in the north-end mines of the Comstock lode were current and were as a rule believed. Now, without any definite or reliable information as to the true existing state of affairs in these mines, and guided solely by the indications of the San Francisco market, people here are just as despondent as to the future as they were over-sanguine when the market was rising.

All this goes to prove what I affirmed in a former communication—that New Yorkers are undergoing precisely the same experience with regard to mining, from the speculative point of view, that has been passed through by the "outsiders" of the Pacific coast. It is to be hoped that the lesson will be learned at less expense.

Last week the aggregate transactions reported at the two local mining exchanges amounted to $12,013 shares, a large proportion being of very low-priced stocks, and probably much of the quasi business being wash sales. The figures quoted mark a considerable decline from the preceding week's.

The transfer of bullion to this city for sale and for refining is considerable, amounting to from $250,000 to $300,000 per week. This is a significant index of the growth of the legitimate mining business, taken as a whole, in New York, notwithstanding the many setbacks which have occurred and the prevalence of wildcat schemes. PAUL WARD.

New York, October 26, 1881.

TO WORK AURIFEROUS CEMENT GRAVEL.—The Barrett Bros., at Peoria Bar, have invented a cement grinder to work their ground in Table mountain, at that point. It consists of an upright column, on which are attached five or six loose-jointed arms, on the end of which are attached 4-lb. hammers, which make 300 revolutions per minute. The whole is encircled in a casing similar to an arastra, and on the inside rim are wedge-shaped pieces of iron at intervals, for the iron fists to strike against in their rapid revolution, which grinds the cement equal to any quartz mill. They claim to save 80% of the precious metal, and after some intended improvements, the proprietors are prepared to put it against any mill in the country for this kind of mining.—*Tuolumne Independent.*

DISPUTED OWNERSHIP.—The work in Yellow Jacket ground at "Prospect drift, at point 4,035 south lateral" of the Sutro tunnel, is carried on by the tunnel company, as they claim the ledge discovered there. The Yellow Jacket folks likewise claim the ledge, holding that as they paid the tunnel company for running the south lateral branch through their ground, and as it is outside of the charter granted the tunnel company the latter have no claim upon it. The question of ownership will be quickly tested in court by the Yellow Jacket company, should pay ore be found. As it stands now, they do not care to contest the matter, as they claim they are getting a knowledge of the resources of their mine in that direction without paying therefor.

WE see, by the Bedrock *Democrat* (Oregon), that Washington district, on Snake river, is now coming into prominence. Several lodes of great value have recently been discovered there. There are copper, iron, gold, and silver carbonates. The principal lodes discovered have been located by Henry Martin, Hoffman & Co. They are the Daniel Boone, Henry Clay, Wide West, Atlanta and Bonanza.

C. C. BEAN is busily engaged in putting up a smelter for the reduction of copper ores in Copper Basin, Arizona. Inside of 60 days he expects to have his furnaces in operation and producing 2,000 lbs. of copper matte per day.

News in Brief.

THE rainfall for October was .54 of an inch.

CALVIN BROWN, civil engineer of the stone dock at Mare island, has been retired.

RAILROAD talk is agitating Winters. The people hope for an extension of the line to Lake county.

THE winnings of the American horses in England and France this year amount to about £30,000.

THE formal transfer of the North Pacific Coast railroad to its new owners took place on Monday last.

ICE from Lake Ladoga has flowed into the river Neva, Russia. Steamboat service has been suspended, and all the canals are frozen.

IT is rumored that parties have leased the Watsonville beach, and propose expending $15,000 in converting the same into a seaside and bathing resort.

BANK COMMISSIONER COLEMAN examined the Modesto bank, at Modesto, on Wednesday last, and found it solvent. The liabilities and assets are $495,535 88.

TWENTY deep water vessels arrived in this port one day this week. There are 148 deep water vessels now in harbor. They are loading at the rate of two each day.

THE taxable property of Esmeralda county, Nev., as shown by the assessment roll, amounts to $1,214,626.98. The tax this year foots up $35,831.51.

THIS will be the greatest year of railroad building in the history of this country. The year 1872 was a wonderful one in this respect, having witnessed the laying of 5,147 miles of track, but to the present time in 1881, with 2 months still remaining, 5,340 miles have been laid.

GEN. DRUM, in his annual report to the general of the army, says: The losses of the army during the year were: Deaths, 248; discharges, 6,564; desertions, 2,361. Total, 9,173. Number of recruits assigned, 3,805. This shows an increase of 1,260 discharges, 13 deaths and 318 desertions.

A STATION is to be established at the Volcano House, on Kilauea, which will be in communication with the United States Metsorological Department, and next year a proper record is to be kept of the movements of the volcano, and a series of observations of volcanic phenomena will be undertaken.

FOR some time past it has been whispered that the English government intends to sell Gibraltar to Spain, and the story seems to have some foundation. It is said that the subject has been discussed in the Cabinet and that the Premier's proposal met with no very decided opposition from the colleagues.

THE final location of the Northern Pacific has been made from the north side of Lake Pend d'Oreille to a point 40 miles above the mouth of the river. The preliminary lines run to Thompson's river, 100 miles west of the Missoula. There is considerable snow now, but a large force will be kept at work all winter.

STOREKEEPERS are generally displaying notices calling attention to the value placed on mutilated coin by the Treasury Department, and stating that no mutilated silver will be received, except upon the basis of value fixed by the Secretary of the Treasury, as follows: One dollar, 65 cents; half dollars, 35 cents; quarters, 15 cents; dime, 5 cents; half dime, 4 cents.

Mining and Scientific Press.

THE MINING AND SCIENTIFIC PRESS is the leading mining journal in America, and enjoys a larger circulation among the more intelligent operators and workers in the gold fields of the world.

Established in 1860, it has firmly maintained its position as a reliable, progressive journal. The information given in its columns has saved millions of dollars to the practical miners, metallurgists, mill men, mine and shareholders on the Western side of our continent.

Among its contributors are the ablest and most experienced mining engineers, superintendents and practical miners in this country.

The PRESS gives a condensed summary of Mining News from the most important mining districts of the country.

New processes and methods of mining are described in its weekly issues. New mining machinery and improvements are frequently illustrated and explained in a manner to be of great value to all interested in mining.

As a scientific and mechanical representative of the Pacific coast it is decidedly popular, and a standard journal with the most thrifty industrial people of the Pacific States and Territories. Its authority is of the highest order, and its usefulness in its special sphere unrivalled.

Every public library, mining engineer, metallurgist, mining operator and intelligent mechanic and manufacturer, will find profit by its reading.

Subscription, $4 a year in advance. Sample copies, postpaid, 10 cents.

DEWEY & CO., Publishers.
No. 252 Market St., San Francisco, Cal.

OUR COMPLIMENTS are due Heald & Banks, machinists and model makers, No. 514 Commercial street, for the substantial manner in which they have made fast our sign in a difficult position.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

Meteorological Summary for the Month of October, 1881.

Station, San Francisco, Cal.

Date	Daily Mean Barom.	Daily Mean Temp.	Daily Mean Humid'y	Prevailing Direction of Wind	Daily Rainfall.
1	29.886	55.7	79.0	SW	....
2	29.951	56.3	82.0	W	....
3	30.030	57.3	79.7	W	.10
4	30.114	56.3	70 3	W	....
5	30.108	56.0	77.3	W	....
6	30.075	57.7	67 0	W	....
7	30.015	58.7	62 3	W	....
8	30.043	59.3	65.0	W	....
9	29.933	61.0	61.3	W	....
10	29.935	55.7	79.0	SW	....
11	30.007	55.3	74.7	SW	....
12	30.009	53.3	03.3	W	....
13	30.141	48.3	55.7	W	....
14	30.266	50 0	66.0	W	....
15	30.084	52 3	77.3	W	....
16	30.180	52.3	02.0	NW	....
17	30.167	54.3	68.7	W	....
18	30.119	55.3	77.0	W	....
19	30.091	56.3	91.0	W	....
20	30.027	55.7	84.7	W	....
21	30.042	55.0	76 3	W	....
22	30.018	57.3	09.0	W	....
23	29.950	56.0	70 7	W	....
24	29.919	53.7	77.3	S	....
25	29.832	57 3	75.0	SE	.01
26	29.900	58.3	81.3	S	.20
27	30.016	57.5	80 0	S	.01
28	30.097	58.3	87.0	SW	.12
29	30.245	56.3	81.7	W	....
30	30.239	57.3	79 7	W	.10
31	30.196	58 3	51.0	NW	....
Sums	931.644	1,732.4	2,283.3		
Means	30.053	55.9	73.7	W	0.54

General Items.

Highest bar, 30 352, Oct. 14st; lowest bar, 29 801, 25th; monthly range of barometer, .551.

Highest temperature, 72., Oct. 9th; lowest temp., 45., 14th; monthly range, 27. Greatest daily range of temp., 15.5, 22d; least daily range of temp., 5., 3d and 20th. Mean of maximum tempe, 61.6; Mean of minimum temps., 51.6; mean daily range of temp., 10.0.

Prevailing direction of wind, west; total movement of wind, 6 240 miles, highest velocity of wind and direction, NW, 13th.

Number of foggy days, 0; number of clear days, 17; number of fair days, 8. Number of cloudy days on which no rain fell, 1; number of cloudy days on which rain fell, 2. Total number of days on which rain fell, 5.

Dates of frosts, 14th, 15th, 16th and 17th.

Comparative Temperature.

1871	61.8	1877	58.6
1872	58.8	1878	61.3
1873	59.7	1879	60.6
1874	59.8	1880	58 9
1875	61.2	1881	55.9
1876	59.6		

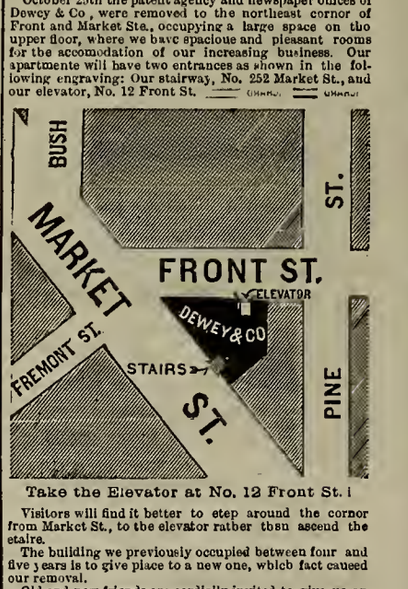
Comparative Precipitations.

1871	0.07 inches	1877	0.65 inches.
1872	0 11 "	1878	1 27 "
1873	0.83 "	1879	0.78 "
1874	2.69 "	1880	0.05 "
1875	0.24 "	1881	0.54 "
1876	3.36 "		

NELSON GOROM, Serg't Signal Corps, U. S. A.

Business and Patent Office Removal.

October 20th the patent agency and newspaper offices of Dewey & Co., were removed to the northeast cornor of Front and Market Sts., occupying a large space on the upper floor, where we have spacious and pleasant rooms for the accomodation of our increasing business. Our apartments will have two entrances as shown in the following engraving: Our stairway, No. 252 Market St., and our elevator, No. 12 Front St.



Take the Elevator at No. 12 Front St.

Visitors will find it better to step around the cornor from Market St., to the elevator rather than ascend the stairs.

The building we previously occupied between four and five years is to give place to a new one, which fact caused our removal.

Old and new friends are cordially invited to give us an early call in our new quarters.

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OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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C. E. WETMORE—Alameda county.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

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San Francisco Metal Market.

[WHOLESALE.
WEDNESDAY, November 2, 1881.

IRON.—	
American, Pig, soft, ton	— — @30 00
Scotch, Pig, ton	28 00 @30 00
American White Pig, ton	— — @ — —
Oregon Pig, ton	— — @ — —
Clipper Gap, White	— — @30 00
Clipper Gap Car Wheel	— — @33 00
Refined Bar	4 @ 7½
Horse Shoes, keg	— @ 5 50
Nail Rod	— @ 7½
Norway, according to thickness	6½@ 7½
STEEL.—	
English Cast, lb	14 @ 18
Black Diamond, ordinary sizes	— @ 14
Drill	15 @ 18
Flat Bar	14 @ 15
Plow Steel	— @ 6½
COPPER.—	
Ingot	— @ 52
Sheet	32 @ 35
Sheating, Tinned 14x18	36 @ 41
Nails	— @ —
Bolts	38 @ 42
Old	— @ 18
Bar	— @ 22
Cement, 100 fine	— @ 15½
LEAD —	
Pig	5 @ 5½
Bar	— @ 6
Pipe	— @ 8
Sheet	— @ 9
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES —	
10x14 I C Charcoal	— @ 7 70
10x14 I C Coke	6 15 @ 6 40
Banca Tin	— @25 00
Australian	— @33 00
I. C. Charcoal Roofing 14x20	— @ 6 90
ZINC —	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS.—	
Assorted Sizes	4 00 @ 4 25

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SAN FRANCISCO, November 2, 3 P. M.

SILVER, ½.
GOLD BARS, 890@910. SILVER BARS, 10@18 ℘ cent. discount.
EXCHANGE on New York, 5@10 premium; London, 49½@49¾; Paris, 5 20 francs ℘ dollar; Mexican dollars, 91@92½.
NEW YORK (4 per cent), 116.

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DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

SAN FRANCISCO, CAL., NOVEMBER 2, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 34, of seventy-five cents (75 cents) per share was declared, payable on Saturday, November 12, 1881, at the office in this city, or at the The Farmers' Loan and Trust Company in New York. WM. WILLIS, Sec'y,

Office—Room No. 29, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

Newcastle Gold Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Yaokee Hill Mining District, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Twenty-third (23) day of September, 1881, an assessment, (No. 21) of two (2) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 33, No. 318 Pine St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the First (1) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Twenty-first (21) day of November, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

E. G. MATHEWS, Sec'y,

Office—Room 33, No. 318 Pine St. San Francisco, Cal.

POSTPONEMENT.—The day of delinquency of the above assessment is hereby postponed to the fifteenth day (15) of November, 1881, and the day of sale to Monday the fifth day (5) of December, 1881. By order of the Board of Directors, November 2, 1881.

E. G. MATHEWS, Sec'y.

Franklin Gravel Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Dutch Flat, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the Fourteenth (14) day of October, 1881, an assessment, (No. 7) of Thirty (30) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 310 Pine street, Room No. 44, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fourteenth (14) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Fifth (5) day of December, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

GEO. R. SPINNEY, Sec'y.

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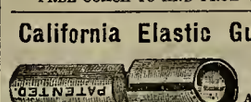

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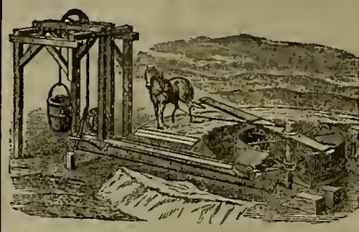

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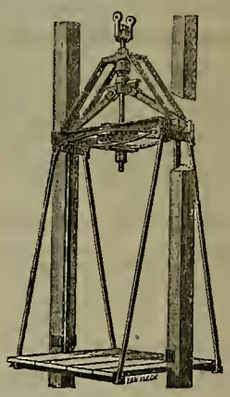

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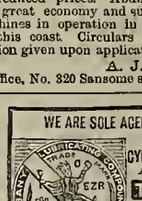

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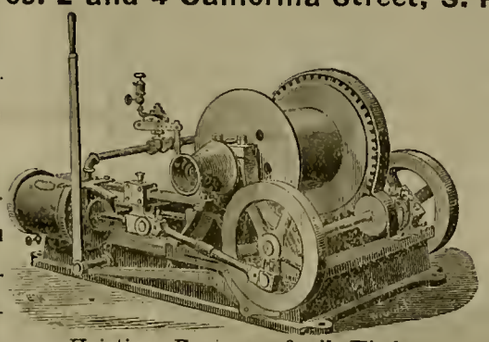

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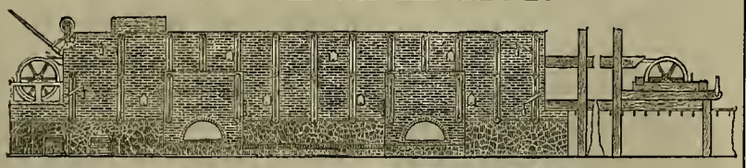
CHLORIDIZING FURNACE.

Patented in 1878.



SIDE ELEVATION OF THE O'HARRA FURNACE.

This Furnace is Constructed with two SEPARATE HEARTHS, one for DESULPHURIZING and one for CHLORIDIZING the Ore.

BOTH PROCESSES ARE PERFORMED AT ONE OPERATION.

—o—

An endless chain carrying conveyors or scrapers passes continuously through over both hearths, going one way through one chamber and the other through the other chamber. By this means the ore is fed and discharged at the same end of the furnace.

A cheap Furnace to build and to run.

The process is essentially the same as the well-known Freiberg process; but the mechanical devices applied to the furnace and the peculiarity of its construction enable the inventor to thoroughly desulphurize and chloridize the ore to a higher percentage than other furnaces, and with less cost for fuel and labor.

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SEND FOR DESCRIPTIVE CIRCULAR TO

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INGERSOLL ROCK DRILLS.

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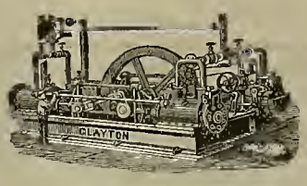

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MANUFACTURERS OF

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HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

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No. 1 XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade.

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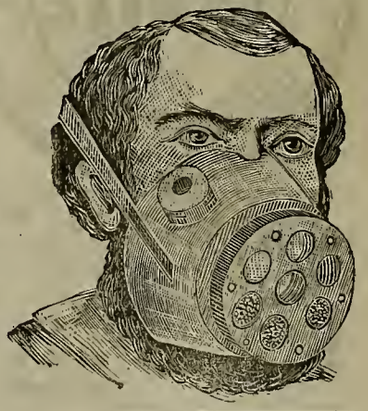

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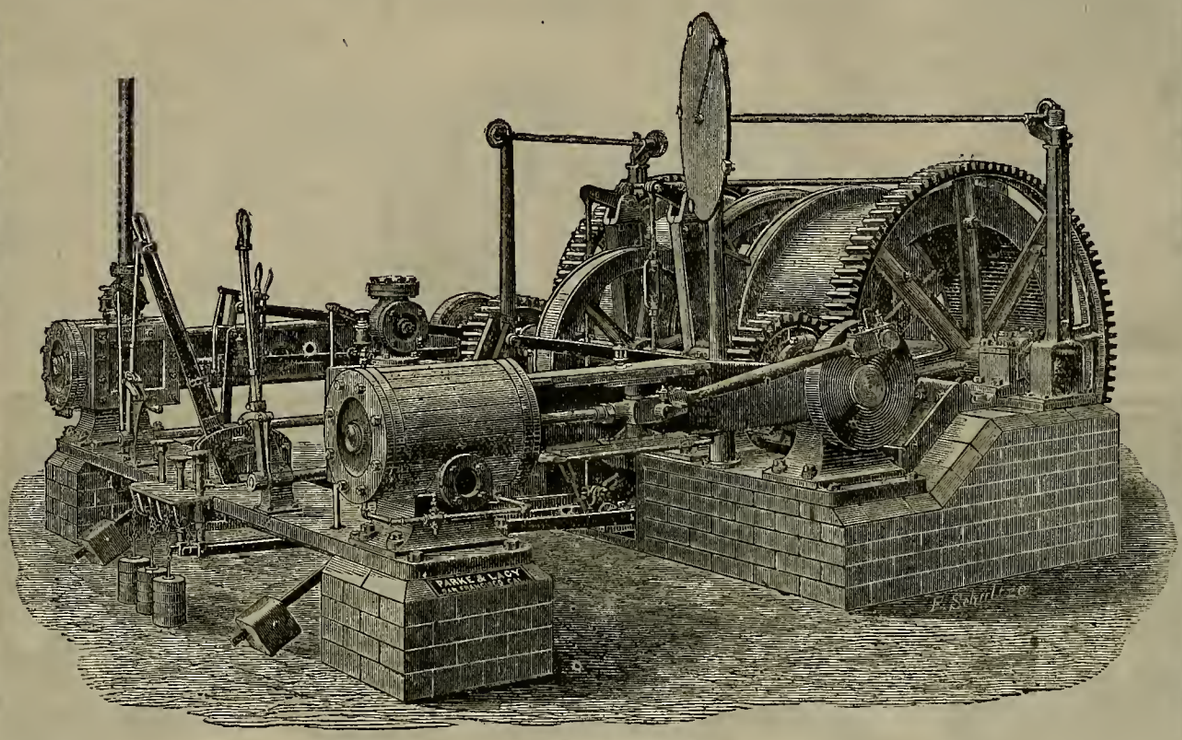

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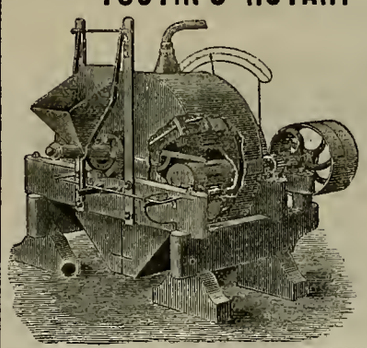

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, NOVEMBER 12, 1881.

VOLUME XLIII Number 20

Weighing Ores.

In England, they used to pay the men by measure for getting out the coal, but now, in accordance with the Mines Regulation Act, they pay by weight. On this coast work is done by the day, without reference to the amount of ore extracted, which of course is necessary in precious metal mining; and in none of our mines are we very accurate in our system of weighing, even where work such as mill work, is done by the ton. Since the introduction of the weight system in England, several devices have been perfected especially for weighing ore. Messrs. Pooley & Sons, of Manchester, have just put into operation at the Pendleton pits some "pit-hauk weigbing machines," on an entirely new principle.

As the machines referred to are the first of the kind which have yet been actually put down, a few details as to their construction will be of interest. The machines are so arranged that the use of weights, springs, racks, pinions and wheels, is entirely dispensed with, the principle upon which they are worked being the creation of a vacuum in a column of water. This is effected by a simple arrangement. An ordinary steelyard is, at the poise end, connected with what may be described as a piston contained in a column of water enclosed within a small tin can, and this takes the place of the usual poise weights. The pressure brought upon the short arm of the lever as the colliery tubs are passed over the weighing table, causes the piston to be lifted through the column of water, and the weight passing over the table is instantly recorded by a moving figure on a quadrant dial, in proportion to the amount of water displaced. A taring arrangement is also provided for allowing for the weight of the tubs, so that the record given on the dial is the exact weight of the contents of the tubs. The action of the apparatus is remarkably quick, six weighs per minute being readily taken over each machine; and Messrs. Pooley, who have applied the same principle to railway wagon weighing machines, claim that a whole train while in transit over the tables, can be easily weighed without stopping. In connection with the pit-hank machines, another feature is the distance at which the weighing table can be placed from the weighing-room; this is the cause of one of the machines at Messrs. Knowles' collieries being 73 ft. The simplicity of the working parts removes to a great extent, any liability to disarrangement in the machine, the danger most apparent in this direction being the possible action of the weather, either by evaporation or frost upon the water column; but this is reduced to a minimum by protecting the apparatus under cover in the weighman's office. So far as these machines have been tried, *Iron* is informed by the colliery officers that they have given satisfaction.

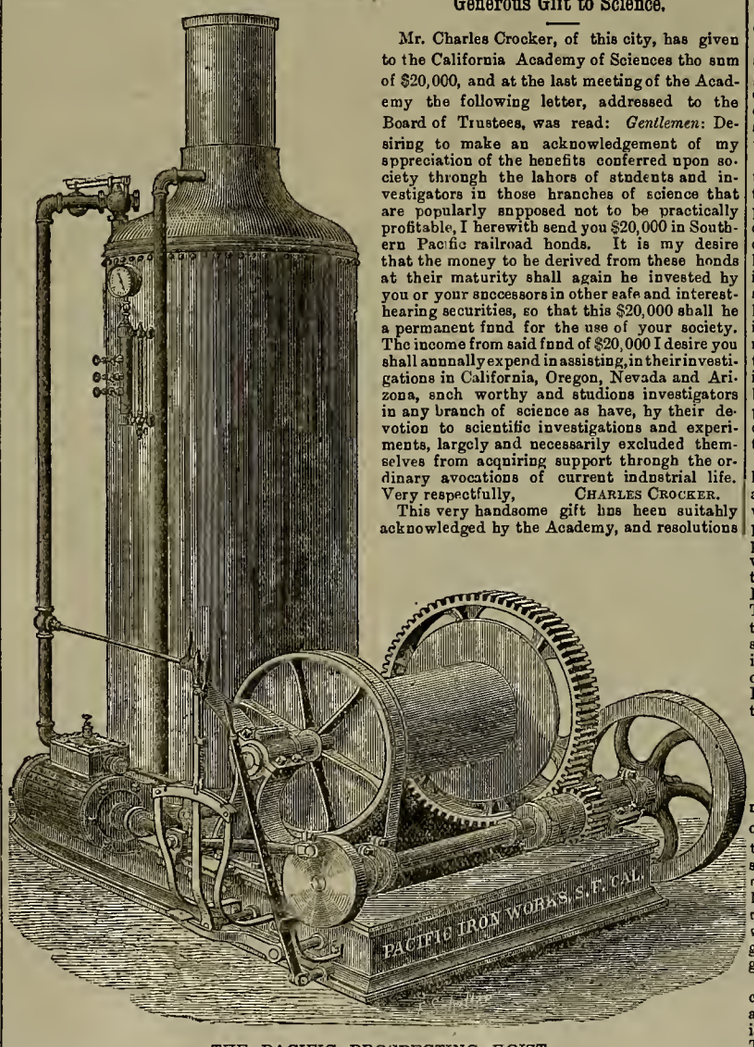
MECHANICAL LECTURES.—A course of mechanical lectures is being delivered at Capt. McNevin's Nautical School, 404 Beale street, corner of Harrison. Mr. Irving Scott delivered the first, which we reported in full. Mr. Wheeler's lecture, of last week, we were unable to give. On Thursday, of this week, Mr. Richards, of the San Francisco Tool Co., delivered a lecture, a report of which we will give in our next. Mr. Dickie, of the Risdon Iron Works, will speak next week on "Marine Engineering." Robt. Moore, W. R. Smedberg, Mr. Eckert, and others, will follow. The lectures are mainly attended by those interested in mechanical pursuits.

A GREAT deal of interesting matter is crowded out of this number of the PRESS to make room for the report of the Debris Committee. For this reason we omit our usual illustration on the 9th page.

THE Virginia company, Tombstone, will now have to build a mill, as they have depended on having their ores crushed at the Boston mill, and the owners of that have now bought a mine of their own which will keep the mill busy.

A New Mining Hoist.

To meet the wants of many mining properties in the early stages of development, Rankin, Brayton & Co., of the Pacific Iron Works in this city, are building the very complete, portable hoist shown on this page. They are made with a single reel attached to the shaft by a clutch, and fitted with a friction brake so that the reel can be lowered with the engine stopped. The engine is fitted with a link motion, so it may be worked for both hoisting and lowering if desired. There is also attached a pump for feeding the boiler.



THE PACIFIC PROSPECTING HOIST.

The hoist is geared about six to one, and the gearing and all other parts subjected to strain are extra heavy. Material and workmanship are first-class in every respect. The reversing brake, clutch lever and throttle, are all placed so as to be conveniently handled by the engineer when at his post. The boiler is of ample capacity, and rests upon a cast-iron base, to which the engine is also attached. The fire box and tubes are made extra large to allow of burning wood in places where coal is not readily obtained.

A large proportion of this class of hoists made at the East, it is well known, are light and flimsy in construction, unsafe, inconvenient, and only answer a very temporary purpose. This hoist is an honest and well-made machine, perfect in all its appointments, and equal to all the demands that may be made upon it within the limit of its capacity. It is confidently presented by the manufacturers as the most convenient small hoist that has ever been gotten up for mining purposes.

The general dimensions are as follows: Engine cylinder, 6 in. x 8 in.; boiler, 34 in. diam. x 7 ft.; drum, 12 in. diam. x 26 in; flanges, 24 in. diam. Drum carries 600 ft. 1¼ in. diam. Manilla rope. Will work to a depth of 400 ft. with a load of from 1,800 to 2,000 lbs.

Generous Gift to Science.

Mr. Charles Crocker, of this city, has given to the California Academy of Sciences the sum of $20,000, and at the last meeting of the Academy the following letter, addressed to the Board of Trustees, was read: *Gentlemen*: Desiring to make an acknowledgement of my appreciation of the benefits conferred upon society through the labors of students and investigators in those branches of science that are popularly supposed not to be practically profitable, I herewith send you $20,000 in Southern Pacific railroad bonds. It is my desire that the money to be derived from these bonds at their maturity shall again be invested by you or your successors in other safe and interest-bearing securities, so that this $20,000 shall be a permanent fund for the use of your society. The income from said fund of $20,000 I desire you shall annually expend in assisting, in their investigations in California, Oregon, Nevada and Arizona, such worthy and studious investigators in any branch of science as have, by their devotion to scientific investigations and experiments, largely and necessarily excluded themselves from acquiring support through the ordinary avocations of current industrial life. Very respectfully, CHARLES CROCKER.

This very handsome gift has been suitably acknowledged by the Academy, and resolutions adopted that the endowment be known as the Crocker Scientific Investigation Fund.

Mr. Crocker's gift is well bestowed. The Academy has struggled along in poverty for a long time, doing its work as best it may. Mr. Crocker has set an example that might well be followed by other of our millionaires in bestowing some of his wealth in a direction where the general public will be benefited. This money will, by the terms of the gift, be a source of continual usefulness, not only in its results, but to the persons producing the results, a class of people which the world is more apt to push aside than to help. All honor, then say we, to Mr. Crocker for his timely and generous gift.

THE Wood River Smelting Works were attached recently, but have resumed work again.

"Grubstaking."

On page 318 is printed a decision by a Colorado judge, which bears on the practice of "grubstaking," so long in vogue in the mining regions of this coast. We see in several of our exchanges, that the decision is interpreted somewhat differently from what we do, after reading it carefully. The court does *not* hold that people who outfit prospectors cannot enforce their contracts to sever whatever interests may accrue, from the results of the prospector's trip. The gist of the decision is, when a person outfits a prospector and the latter squanders what he has received, and enters into another similar contract with other parties, the first grubstaker cannot come in and enforce any claim on what may be discovered under the second contract and by the aid of the second grubstaker. All the rights are with the person in whose immediate employ the prospecter is.

Most people imagine this to be a death blow to grubstaking, but it simply seems to express the status of the practice, and does not, it appears to us, add any new features. A great deal is left to the honesty of the prospector of course; but a great deal always had to be left to his honesty. He might find a rich claim, leave it and afterwards return to it and take possession; or he might repudiate all claims as has been done hundreds of times. There is no hint in the decision, that grubstaking contracts will not be enforced. There is not even any limitation upon them. The decision simply says that in order for such a contract to be good it must be the one which is actually sustaining the prospector at the time, and pushes to one side all contracts which he may have made previous to the one under which he is in fact operating.

The whole story is, A outfits a man, and sends him to Hailey, Wood River (or anywhere else), and when he gets there, some Hailey man, who we will call B, chooses to also employ the prospector to prospect for him, and if the prospector finds anything, then B who gave him $10 worth of bacon, beans, flour and whiskey, takes the claim, and A who paid his fare to Wood River (or anywhere else), is left out in the cold. This is the plain English of it. According to this, men in mining camps where there are stores, are much more likely to have interests in claims, even than those men in cities who outfit prospectors or the "grubstake" system. It is just as well for people to remember what the law on the subject is.

A Conference of Miners and Farmers.

The Committee of the Board of Trade have not given us much that is new in their report on the debris question, which we publish in this number of the PRESS. The principal result is the appointment of a joint meeting of miners and agriculturists in this city on the 17th, to discuss the question. The conclusions reached by the board are not very marked; but we could hardly expect people in trade to suggest any remedy for an evil which requires engineering knowledge to overcome.

The farmers have evidently impressed the committee greatly, and given the idea that the area damaged is much greater than it actually is. The language of the report shows this. The suggestion that the miners pay all expenses for dams will be hailed with delight by the farmers. But a compromise which throws the burden all on one pair of shoulders is hardly the sort of compromise to meet with general favor.

While the committee have not accomplished more than could have been expected, their mission has served to call attention more carefully to the matter; and has perhaps brought about a feeling that maybe the difficulty can be settled without the aid of the lawyers who are waiting for fat fees from the opposing factions.

We shall await with interest the result of the conference to be held here this month.

THE pocket mines of Sierra county turn out a great deal more gold than most persons suppose.

Salmon River.

The Idaho *Messenger* says: Almost everybody seems to hs laboring under the mistaken idea that not only all this region, hut the Yankse Fork country, and some even think that the rich Bay-horse fislds, helong to Wood River, while the truth is, that all these grand mountains of untold newly discovered treasures lie on the Salmon river waters—and the half, doubtless, is not yet told. Salmon has one side of this wondeful chain of mountains, while it takes Lost river, Wood river, Boise, Payette and Weissr rivers to cover ths opposits side of the rangs, and ws say time will prove Salmon river equal in mineral wealth to all the others combined. We shall no: cry if it does. God made it and we will abide it. But our readers will hear in mind. that not a single ledge we have yet described in the 21 numhers of the *Messenger* lies on any hut the Salmon waters.

Smiley Gulch.

Informatiou had heen given us that all the Lake, Bcaver and Smiley creek cluster of mines lie in granite; and that there was no other formation; but, on entering the Smiley valley helow the town of Vienna, we see a lime reef, which evidently extends into the main range. Snow on the ground prevented us, however, from making a critical examination and the limit or extent of this formation we could not speak of. This may, perhaps, chauge somewhat the uniformity of grades and kinds of ores. At least it will be of great nse for building purposes; and as there ie a town of great promise being built here, lime has its value.

Ae we ascended the mountain divide at the head of Smiley, snow fell in hlinding quantities, and it was with great difficnlty one could find a camp. At last, however, we found the

Vienna Mine

On which the company have run a 200 foot tunnel, cutting the vein at right angles; thence on the ledge they have run ahout 200 feet more. Besides this they have run a second tunnel in about 180 feet; and a third of considerable leugth. The ownere of thie mine are largely interested in the Mountain King, and it is contemplated tbat they will construct a mill for these mines next season. The uppsr tunnels of the Vienna are said to be in very excellent ore.

The Solace.

This mine was discovered last epring and sold thie fall to Haggiu & Co., for the reported sum of $40,000, and ie to have a mill constructed on it in 1882. The vein is exposed hut in oue place of ahout 30 ft. in length and 8 ft. in width, and perhaps, for 6 or 8 ft. in depth. But there it stauds—a grand little mountain of ore, said to sample from $400 to $500 dollars for its whole length and breadth, and to he as whole and compact, almost as that much bulk of cast iron.

The Mountain King

Was rightly named. It is located on the east side of Smiley creek nearly opposite the Vienna, which will he worked with it.

There is a tunnel of ahout 50 ft., perhaps 75, in on this mine starting near the discovery rock and running on the vein. The excellence of this mine is the great capacity or volume of it and the richness of ores with which it is filled.

Besides the tunnel there ie a cut across the mine 100 ft. or more below, where the company are constructing living departments and a shop for repairs as well ae a roof over what will be the working tunnel of the mine. In this cut the vein ehowe a width of full 16 ft, which is merely surface.

There was considerable ore on the dump, all looking rich wherever we tried it, of rnhy and black snlphnretic silver. In this clnster of mines (Smiley's gulch) tbere are native eilver ores, but little, if any, horn silver or chlorides.

Peabody Mine.—The new pumping and hoisting works on the Peahody mine have reached so near completion that the work of pumping out the shaft wae commenced recently. It was but a few weeke ago that the company determined to replace the old worke hy those of more etrength aud capacity, and acting npon that determination, with Robert Cryer as superintendent, and Joseph Slack as master mechanic, the new improvemente have heen carried forward with energy. The new works, as were the old, are to be rnn hy water power, the watar, 100 inches, heing obtained through the V flume. The flume conveying the water to the works has heen raised 11 ft., to he adapted to the new wheel, which ie 36 ft. in diameter, and superior in its construction for etrength and good workmanship. The framework of the building is also very strong, and the storiee are made high in order to provide for a convenient dump. All parts of the machinery for pumping and hoisting have heen made strong, and well adapted to the purpose of opening the mine. The shaft is down nearly 200 ft., and will he pumped ont in a few days, when sinking will he resumed, and at the same time, a drift is to he started, from which ore will be extracted. With the new improvements, the Peahody will be systematically opened, in the expectation that it will prove a good mine.—*Grass Valley Union.*

Eureka.—Attracted hy late developments, the town is filling np with mining men, and many important sales of mining property are under negotiatione. The people of Eureka are confidently expecting a great hoom in the near future.

Eureka Con.

The Secretary's annual rsport of the Eureka Consolidated mine, Eureka, Nsvada, makes the following showing:

From 5,396 tons base bullion	$1,720,313
Sales of Candles	1,260
Sales of Powder, Fuse and Caps	3,384
Sale of boiler	500
Sales of Lumher, Hardware, etc	99
Discount on Coal Receipts	444
Assaying	3
Total receipts 1880-81	$1,726,003
Superintendent's drafts	19,902
Cash in hands Supt. Oct. 9, 1880	97
Cash on hand Oct. 9, 1880	24,521
Total resources	$1,770,523

The dishursements for the past fiscal year have hesn as follows:

Mine account	$ 345,091
Ore account, purchase of 3,069 tons	117,204
Smelting account	435,233
General expense at mine	26,336
Expenses at San Francisco	11,205
Construction new shaft	164,956
Transportation and refining charges	198,620
Twelve dividends	300,000
Legal expenses	9,143
Interest	25
Drafts carried over from last year	1,922
Bill for supplies carried from last year	851
Balance advances Oct. 9, 1880	14,982
Total dishursements	$1,625,966
Cash in hands Supt. Oct. 9, 1881	222
Cash with Laidlaw & Co.	2,000
Cash in Bank of California	142,365
Total	$1,770,523

It ie not out of place to give a brief review of this wonderful mine. The company was organized about a dozen years ago with a nominal capital of $5,000,000, in 50,000 shares. The only actual capital paid up was $100,000 in two assessments of $50,000 each. With this small outlay an immense business has been developed, expensive litigation conducted and large profits dishursed to stockholders. There have heen 72 dividends declared, ranging from 30 csnts to $3 per share. There were no dividende in 1872 or 1876, and there will probably he none for the next six months, or until the present improvements at the miue are completed and paid for. The surplus, $144,857, will harely do this. Beeides the "dead work" and prospecting at the mine will also ahsorh a large dishursement. During the past fiscal year the mine has paid 12 dividends of 50 cente each, making a total of $300,000. The 72 dividends declared were as follows:

	No.	Amount.
1871	6	$ 275,000
1873	4	200,000
1874	4	175,000
1875	8	300,000
1877	4	600,000
1878	12	1,800,000
1879	12	825,000
1880	12	230,000
1881	10	250,000
Totals	72	$4,705,000

Mining in Lake Superior.—The following extract in regard to the "hoss" mine of the Lake Superior country, will he read with interest by our mining men, as giving some idea of the method of working in that region: "The Calnmet and Hecla mine, of Lake Superior, has eight sbafts, the deepest of which is 2,500 ft., deep, while the average of the eight is about 2,000 ft. From each of these shafts, at a distance of 75 ft., run two levels to the extremities, say, each of them three-eighths of a mile long. The total length of drifts would thus amount to about 25 miles. To keep these workings safe, hetween 3,000,000 and 4,000,000 logs are used every year. The ore is boisted to the enrface partly hy the old engine, hut chiefly hy the new compouud engine of 5,500 horse power, with one cylinder 70-inch, and the other 40-inch diameter. The Calnmet and Hecla engine can hoist, and the mine can produce, 1,500 tons a day, but the rule ie that the production ehall not exceed 1,000 tons. On reaching the surface, the ore is loaded in care and hauled hy locomotives over the company's road to the etamp mill, four miles distant, where it is crushed for the smelter."

Good Hope District. —The *Times-Review* has the following relative to Good Hope district, which is eitnated near a fork of the Owyhee river, on the Winnemucca and Cornucopia road: "On the Ohio Con., four men are at work taking out ore. The vein averagee 20 inches, and thc average assay is $98. There is now 120 tons of ore on the dump. Burr Gordon and John Dearden have renewed their lease on the Snyder mine, and have gone to work. It is reported that the ledge in the Silver Brick tunnel has heen struck, and that good ore is bsing taken out.

Beginning on Monday, the "limited express" train will commence runuing over the Fort Wayne and Pennsylvania railroad hetween Chicago and New York. The train, it is claimed, will make the journey from Chicago to New York in 25½ hours, and shorten the actual running time between New York and San Francisco to 5 days and 23 hours.

The Sonth Yuha mining tunnel company'e property, consisting of placer claims and water and tunnel rights on the Sonth Yuba river, in Bridgeport township, Nevada county, has been sold to Geo. T. Emery, of San Francisco, for $12,000.

The Board of Regents of the State University has decided to establish examinations in Los Angeles and Marysville next Jnne, to be held on the same date as those at Berkeley.

The Eureka Tunnel.

A *Sentinel* reporter visited the tnnnel on Friday in company with Supsrintendent Butlsr, and found that work was actively progressing on the ore body recsntly discoversd. The ore was sncountered 1,100 ft. from the mouth of the tunnel. A drift was started almost due sonth on a small vein, not more than 3 in. thick and 4 ft. in width. This streak assayed very high and provsd to be very rich. For the first 10 ft. it continued about the same, when it pinched out almost entirely for 3 ft., leaving only a very small, yellow line, but easily traceable. Maurice Hartnett, the foreman, without being the least discouraged, pnshed the drift ahead, and in the next few feet came against what has since proved to he a solid hody of very high-grade ore, richer in proportion to the quantity than any heretofore taken out in the camp. On Friday, at the time of the reporter's visit, the drift had penetrated the ore a distance of 40 ft., the sides, roof and wall 15 ft. from the tnnnel showing the same rich character of rock. Thirty feet from the tunnel a large incline winze has hsen sunk towards the west to a depth of 26 ft. in eolid ore, the face of the winze showing even better material than that passed through, a heavy vein of hlack metal appearing very prominent. Work on the winze was temporarily suspended, there heing no way of getting out the ore. A etation is, however, heing huilt for a wiudlass. An upraise in the ore, to the east of the face of the drift, was etarted on Friday, in order to test the range of tbe bonanza in that direction. The drift will also be continued south. From the time the ore hody was encountered, the foreman informed the reporter, not a single car-load of waete has heen taken out. A track has beeu laid directly to the winze, and one man handlee a car going and coming without difficnlty, making the extraction of the ore cheaper, probably, than that of any miue on the coast. The atmosphere is cool and pleasant, and hut little inconvenience is experienced from the heavy blasts. The ore and snrroundings are perfectly dry, and water will not trouhle the miners. The extent of the ore body cannot, of course, yet be determined, hut the explorations so far made demonstrate that it must he of vast extent. Seven men are now employed, but this force will be increased as soon as room can he made for them to work comfortably and profitably. All tbe work so far done appeare to exhihit good judgment, and not a dollar has heen wasted. With the present force, Superintendent Butler says, 20 tons of ore can de extracted every day when the windlsss is in shape.

The magnitude of the work and the patience, perseverance and outlay of the projectors can hardly be gleaned from the ahove illustration. The community in general owes a debt of gratitude to Gen. Connor for its incipiency and success. He located it and organized a company. A certain amount of stock was to be used as a working capital, and an effort was made to enlist the public in the enterprise. However, few shares of the etock were sold in thie way, some at 50 cents and some as low as 25 cents; until within the last two years it could not be sold at any price. The gencral public had no faith in the tunnel project, and sent its money to develop the Comstock. The General then determined to carry on the work at his own risk, and has heen doing so up to the time of the strike. He will now receive the reward of his faith and judgment. But in giving Gen. Connor credit for hie share in the enterprise, we must not forget two of his associatee in adversity, E. J. Butler, the Secretary and Superintendent, and Maurice Hartnett, the foreman, hoth of whom had also taxed their resources, time and labor until it appeared almost impossible to continue under the strain. They deserve the good fortune that awaits them.

Blasting Without Drilling.—An exchange givee the following, which might possibly he utilized on the Comstock in some kinds of work: "An Austrian engineer, named Laner, has discovered a new method of disintegrating rock. The chief feature of his eyetem is to employ a hollow cylinder, like gas pips, and to plaoe the dynamite cartridges, not as hitherto in a hole bored into the rock to he hlasted, hnt in the cylinder in question. The cartridge only tonches the surface of the rock it is desired to shatter. The explosion of the dynamite ie effected hy electricity, and the effect is said to ho greater than with the nsual cartridge in a hole bored in the rock. The rock in shattered into fragments so small that a fair stream is able to wash them away without help, whereas in case of gunpowder, the rock is only split up into blocks more or less large and troublesome to remove. The Lauer eystem is calculated to save fully 40% as compared with the old system."

The Old Style.—A man was recently met in one of our mining districts driving along the road with a pair of mules and an old wagon.

"What lay are ye on?" asked a borseman who met him.

"Goin' up the cauyon to locate a mine."

"Can't locate no mine in that canyon. Can't find any pay ore."

"So I heard, so I hrought it along in this sack."

Teamster winks, holds up a chunk of $14,000 rock and they both take a drink.—*N. Y. Daily Stock Report.*

Candelaria.

A correspondsnt of the Virginia *Enterprise* gives the following concerning this mining camp:

Candelaria cannot hoast of her sevsn hills like ancient Roms. It is comfortahly nestled in ths mountains, which loom up on the north and south until their hlack outlines stand out in hold relief against the blue-vaulted heavens, while a thousand smaller peaks add variety to the landscape. We have no forest and no mountain torrsnts. To the wsst of Candelaria, on a heautiful eminence overlooking the town, is a miniatars city of ths noble red man, consisting of some rnde stone houses, a cress hetwesn tbe ancient Egyptian and the days of Adam. Thsse people find employmsnt around Candelaria. Some have become much civilized, "all same as white man," get drnnk, and swear and fight on the essence of bug juice. This is an age of progress, however. The white popnlation is iudustrious and temperate, as a rule. We have no churches or religious doctore to orate to us on Sundaye; no melodeons, and no operas. There are two bande—one string, the other brass. The latter numbers 11 instruments. Both do credit to the place. There is a school for dancing with 50 odd pupils, some of the heet young men of the place. I euppose this world is all a stage, and the refined lady and gentleman must he the vauguard of society. At present we aro all on the *qui vive* to see the locomotive some day march into Candelaria at double quick, and promenade to the eouth. I nnderstand that the railroad company is driving ahead. We will soon havs an ahundance of fine granite water from tho neighboring mountaius. Then we will he happy. Town lots have heon a shade higher within the past three months. The sound of the carpenter'e saw and hammer makes music all the day, fixing up for winter. Prices of firewood remain at the maximum of $18 per cord. Our merchants are laying in a large eupply, taking Time by the forelock, hsfore the approach of had roads and the cold, chilly storms of December. There is oonsiderable competition between the merchants. Our laboring population numhers between 200 and 300, exclusive of females, children and Chinese. The town is lively on pay-days. The mining population sustains its present prosperity. It has hesn the constant hlow of the pick and hammer that bas opened our fonntains of silver. Capital and labor have converted Columbus district into a human hive of indnstry.

Our mines justify all the money expended for their development. They extend over eight milee, rnnning west and southeast. We have some fine turqnoise, so much valued in jewelry, fire clay, petrified wood, plaster of paris, hesides a large vein of chlorides running through the distriot with hig croppings. In the future I will give a more elaborate account of the Columhue mineral zone.

The Poison of Human Saliva.

Recent observations hy M. Gautier, communicated to the Parie Medical Academy, afford reason for believing that the poison of serpents differs from that of human saliva in its intensity rather than in its essential nature, eo that the fears with which a human hite is often regarded may not ho wholly unreasonahle. To test this idea M. Gautier took eome 20 grammes of human ealiva, and, after lixiviating and purifying, obtained a substance which, injscted under the skin of a bird, in the form of a solution produced remarkable poisonous effects. Almost immediately tbe hird was seized with tremhling. It staggered and fell to the ground in a state of coma and complete stupor, terminated hy death in half an hour or an hour, according to the dose injected and the vigor of the animal. The phenomena resembled fully thoee prodnced hy the hite of a venomous serpent. The poisonous matter of the saliva ie thought to be an alkaloid similar to the cadaveric poisons called *ptomaines*, which MM. Brouardel and Boutmy have isolated. Like them, it produces Prussian blue when mixed with ferrocyanide of potassium. The facts stated throw some light on the question of virulent maladies. The present case, it ie pointed ont, is not that of a true virus; for at high temperatures a virne is destroyed, hut when the salivary alkaloid is heated to more than 100° its poisonous property is not affected. M. Gautier studied comparatively the poison of the cobra (one of the most formidahle of Indian serpents). This injected, in a dose of one milligramme in a quarter of a cubic centimeter of water, under the skin of a small bird, snch as a chaffinch or a sparrow, kills it in five to twelve minutes. One ohserves torpor and coma, then a period of excitatiou, with convulsions and tetanic contraction. In connection with the snhject, a correspondent of *La Nature* calls attention to a passage of Rahelais in which the poisonous nature of human saliva is recognized.

Ex-Congressman Thos. Wren, says the Winnemncca *Silver State* of Oct. 21st, passed through here yesterday, going west. He said what seemed to he the largest hody of ore ever discovered in Eureka wae found in the Richmond miue, hetween the 600 and 700 levels, last Tuesday. He considers it the moet important mining discovery of the year, and says "there's millions in it."

Several of the Arctic whalers have arrived in port, hut there is no news of the *Jeannette.*

MECHANICAL PROGRESS.

Points about Lathes.

There are details about lathes where improvements could be made that are worth considering: For example, suppose the front end of the tail spindle has a collar fitted to it threaded on the outside, so that we could take a chuck off the dead center and screw it on the spindle! Very often that would be an advantage on some work. We could take off a chuck with the work on it, screw it on the tail spindle, run the drill with the live spindle, and put holes anywhere about the work with the assurance that they were exactly true with the turned face. We could chuck a small eccentric or crank by the hub, turn the outside, change the chuck to the tail spindle, set over the tail stock, and bore the hole in the eccentric with the assurance that the job would be true.

Another point: When a tail stock is designed to set over, why should it not have a steady pin to enable it to be set to turn parallel again, such as some brass-finisher lathes have? Every turner knows how troublesome it is to set a lathe back, after turning a taper to turn parallel.

In one detail most lathes are too light, and it is such a minor point that it is always overlooked, or is in many cases within our experience, and this is the feather that holds the tail spindle from turning. Where a center only is used in the tail spindle, of course there is no strain to speak of; but some machinists have occasion to fit special tools in the spindle, as reamers or large drills, and in this class of work a light feather will not stand the strain. These are, perhaps, small things in themselves, but it is the detail that makes the tool—not the polish on it.—*Mechanical Engineer.*

COMBINED ANVIL, PUNCH AND SHEARS.—Mr. H. A. Schnelkloth of New York City, has invented a combination device, which answers for the triple purposes of anvil, punch and shears. The anvil is of the usual size and shape, the shank and base portions being hollowed out to receive the shear lever which projects from one end of the anvil, and the punch lever which projects from the opposite end. The fixed blade of the shears, as well as the female portion of the device, is arranged upon strong transverse base portions of the anvil, both being set into dovetailed recesses of the base. The base below the opening of the female die is provided with a hole of gradually increasing width, through which the punchings are readily dropped. The movable blade of the shears is attached to the front end of a fulcrumed lever, the rear end of which is connected by a strong link to a fulcrumed lever which carries the male die of the punching device. The shear lever is connected by a pivot link, with a vertically guided block, in which is formed the socket for the punch, this block being guided by beveled cheeks of the side walls of the anvil, and by an angular front plate. The link serves to raise the block, while a solid piece, interposed between the block and the end of the lever, serves to press the block down so as to force down the punch. The inner end of the punch lever is provided with a toothed segment which meshes with a pinion keyed to a transverse shaft, and provided with a lever by which either the punch or shears are operated according as the lever is thrown into one direction or the other. This shaft is journaled in bearings of the side walls of the anvil, and carries at its outer end a socket frame into which the handle is inserted and clamped when it is desired to operate either implement. In this manner a handy and compact combination tool for metal workers, which serves as an anvil, punch, or shears is obtained, which does not take up more space than a common anvil, and dispenses with separate punching and shearing implements.

THE LIFE OF A CAR WHEEL.—When the ordinary chilled car wheels were the only kind in use, 45,000 miles was considered an exceptionally good record for a wheel, while the great majority would run from 35,000 to 40,000 miles only. With the present steel-tired wheel, 300,000 miles' wear is not unusual, and wheels have even been known to live through 600,000 miles' service. A prominent New England railroad has about 1,900 of these wheels in use, the average life of which is 122,000 miles, many of them being new. From the number, 666 wheels which had been longest in use were selected, and the record showed an average mileage of 215,578. Among the number were 126 which had run over 250,000 miles, and 35 had a record of over 300,000 miles, while two had attained 490,915 miles each. It may not be generally known that railroads keep a record of every wheel in use, but such is the fact. Every wheel is numbered, and its life is traced by its daily service. The employees of the railroad are required to report the distance run at the end of each trip, and a record is made of the mileage of each wheel. Regarding the comparative cost of chilled and paper wheels, it may be said that while the price of the latter is considerably higher than that of the former, longer wear more than compensates for the difference. The ordinary chilled 33 inch wheel costs from $13 to $14, and the steel-tired wheel of the same size about $55, while the 33-inch paper wheel costs about $75.

Machine and Man Power in Production.

The census exhibits some curious and important facts, and none more interesting than the increased production of wheat over the increase of population in the United States. In 1849 the entire wheat product of the country was 4.33 bushels per head of population. In 1859 the total product of the same cereal was 5.5 bushels per head of population. In 1869 the product was 7.8 per head, while in 1879 the total product was 459,591,093 bushels, giving 9 bushels per head. Now this increased product per head is not to be accounted for on the supposition that a larger per cent. of population is going into agricultural pursuits each year, because the census shows that the contrary is the fact. Nor can it be accounted for on the supposition that there is an increased production per acre, for the same census disproves this proposition, and shows that the yield per acre over the whole country has neither increased nor diminished materially for the past 40 years.

We must seek an explanation of this increased ratio of production over population in the fact of the rapid improvement in agricultural machinery and in its more general use. Machine and horse and steam power is supplanting or supplementing man power, and rendering the exertions of man more remunerative—in other words, adding to the value and productiveness of man's labor. Laborers are apt to think that the more machinery is used in production the demand and compensation of labor will decrease, but the contrary is the fact. Wages have been steadily on the increase for the past 40 years, and have kept pace in that increase remarkably in proportion to the increased production of labor.

A NEW SECURITY AGAINST EXPLOSIONS.—The St. Louis *Age of Steel* says: "A Canadian mechanical engineer named Arnoldi has invented a device designed to give a partial security against boiler explosions. The invention consists of an electric adjustable attachment to the ordinary steam gauge now in use, to give an instant and continuous alarm, at any distance from the boilers or other pressure generators, of any excess of pressure over that at which the alarm has been set, and where there is more than one generator in operation, an ordinary 'tell-tale' can be attached to signify which generator is at fault. The invention possesses a great many valuable features, prominent among which may be noticed that it is extremely simple and inexpensive, and can be attached to existing arrangements at no expense beyond that of the alarm itself, and without in any way affecting the present adjustment of the gauge." This apparatus might be made very useful if placed beyond the reach of the boiler attendent, and connected by wire with the residence of the superintendent or owner of the boiler. It would, at night, especially, tend to keep a watchman on the alert, who might otherwise coal up the fires for a good rest, go to take a smoke or nap when he should be attending to his duties. It would be an easy matter, however, for a rogue to disconnect the wire, and thus defeat the object of the device.

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS commenced its regular annual meeting in New York on the 3d inst. Although this will be only the second meeting since the organization of this society, yet it has so rapidly increased its membership, and has become so favorably known to practical mechanics as a live and progressive body that we bespeak an interesting gathering on that occasion. There will, undoubtedly, papers be presented and discussions carried on upon matters both theoretically and practically valuable to all those who wish to keep themselves abreast of the industrial questions of the day and much information elicited which cannot fail to be advantageous to the mechanical interests of the country at large, as well as to the individual welfare of its membership.

IMPROVED EMERY PAPER.—Emery paper is frequently found lacking in retaining an equal efficiency, the fresh parts biting too much and the paper getting soon worn through in many places. Emery has been tried on linen, but with little success. A paper or board has been recommended in which emery enters as a constituent part. It is advised to employ fine and uniform cardboard pulp, with from one-third to half its weight of emery powder thoroughly mixed with it, so the emery may be equally distributed. The mass should be poured out into cakes of from one to ten inches in thickness. They must not be pressed hard. Such a paper, it is said, will adapt itself to the form of the articles, and will serve until completely worn out.

TOUGHENED GLASS.—Though superior to ordinary glass, toughened glass has never yet taken its place, which is no doubt largely due to its extra cost. Mr. Frederick Siemens, however, now proposes adapting the toughened glass made by his process to the manufacture of lamp posts, water mains, etc. His glass, he says, is stronger than iron castings, imperishable and incorrodible, and though the price per lb. is twice that of iron, the specific gravity is so much less that the user will be able to obtain glass articles at about 30% less than the same goods in cast iron. Mr. Siemens promises this, but it does not by any means necessarily follow that he will perform, as it is no easy matter to upset the long accustomed use of materials.

SCIENTIFIC PROGRESS.

Chemistry in the Industries.

Chemists are steadily revolutionizing old processes and ruining old industries by their synthetic methods of making the counterfeits of natural products. The madder industry of France was the first to feel the power of modern chemistry, and now madder is a comparatively useless crop. The coloring principle which was so valuable to the dyer was analyzed by the chemist, and separated into its elements; but the chemist went farther; he found a comparatively waste substance which, by a little manipulation, would yield just the same elements as the madder root in just the same proportions. Consequently it must, except under special circumstances, be identical in constitution with the natural product.

The indigo planters of India are threatened with a similar extinction, for the coloring matter known as indigo has been synthetically prepared in the chemist's laboratory, and only awaits a cheaper raw material than the indigo plant to gradually bring about the decline of one of the most profitable crops of India.

Citric acid is another notable instance of the triumph of synthetical chemistry; and latterly a process of preparing vanilla, the essential oil of vanilla, has been patented in England. A majority of our flavoring liquids and the most delicate perfumes, which were formerly the result of slow processes of distillation, are now produced by chemical manipulation from inorganic substances. It is now almost impossible to purchase in the Eastern States or in Europe a genuine article of fruit jelly. Microscopical examination or chemical analysis shows that these preparations are now colored with chemical dye stuffs and sweetened with artificial sugar made from corn by the sulphuric acid process. By-and-by chemistry will make for us the most delicate perfumes and the most costly flavors out of the waste substances of other industries.

But chemistry has also its more legitimate fields of labor and research. It has become an almost indispensable assistant in all the large industries of the world. It has revolutionized the iron industry and that of the dyer, while both the farmer and the miner would now be completely at loss without its aid. It is constantly at work devising new methods for many of the minor industries. Our eyes have just fallen upon the two following items in this direction:

"The growing importance of magnesia in the manufacture of cements, artificial stones and fire-proof brick and other refractory materials, has led to a number of attempts to produce it from chloride of magnesium, found in such abundance at Stassfurt, Germany, and elsewhere. M. Closson, of Paris, has recently introduced the treatment of chloride of magnesium leys with burnt dolomite, and has thus produced very pure magnesia. At Leopolds hall, where the process has been introduced on a working scale, magnesia bricks have been made, which, according to *Chemical News*, have resisted even the flame of the oxy-hydrogen blast."

"A new method of preparing chlorine has just been introduced by J. Townsend, of Stassfurt, Germany, who accomplishes this purpose by mixing a heated solution of magnesium chloride, of 40° to 50° Baume, with about 10% of manganese dioxide, and then exposing it to the action of heated air, whereby the chlorine is liberated, which may be used in the ordinary manner. The process is facilitated by the addition of 25% to 50% of calcium chloride."

EFFECT OF PRESSURE ON SEED GERMINATION. In a note communicated to *Nature* by Mr. W. Carter, an account is given of the effect of pressure on the germination of seeds. He found that under a pressure of 2½ atmospheres, mustard seed germinated 25 hours earlier than under the ordinary pressure of the atmosphere; but that the early development became permanently arrested during the eight days of the experiment, and the cotyledons of one that had escaped entirely from the seed coat remained as etiolated as if grown in absolute darkness, while those under ordinary pressure grew rapidly, and their cotyledons became of a deep green color. The etiolated plants, when removed from the pressure, rapidly grew into vigorous young plants. An increased pressure would, therefore, seem to stimulate germination and prevent the formation of chlorophyl. The pressure was obtained by the use of a column of mercury. The seeds were sown on moist cotton-wool, placed in a small bottle, which was then secured to the curved extremity of a glass tube, into the long arm of which mercury was poured until it reached a hight of 45 inches above the level of the metal in the short arm.

THE CAMERA FOR DETECTING FORGERIES. The Bank of France is said to have almost wholly abandoned chemical tests in favor of the camera for detecting forgeries. The sensitive plate not only proclaims forthwith the doing of eraser or penknife, but frequently shows under the forger's figures the sum originally borne by the check. So ready is the camera to detect ink marks that a carte-de-visite enclosed in a letter may appear to the eye without blemish, while a copy of it in the camera will probably exhibit traces of writing across the face, where it has merely been in contact with the written page.

"COSMICAL DUST."—Dr. Lasaulx has investigated the subject of "cosmical dust," a mineral dust collected at different times at various points of the earth's surface, to which a cosmical origin has been assigned. A portion of the original material from the interior of Greenland, collected by Nordeoskjold, and named by him *cryoconite*, was examined microscopically and was found to be not even approximately homogeneous. On the contrary, the dust was made up of particles of quartz, mica, orthoclase and triclinic feldspars, magnetite, garnet, apidote and hornblende, and, with these, brown or brownish-green particles of organic nature, probably microscopic algæ. Dr. Lasaulx concludes, from the absence of augite and chrysolite, that the dust could not have come from a volcano, but that it was derived from the gneissoid rocks on the coast of Greenland; that there is no reason to think of a cosmical origin for it, and the presence of quartz and mica declare against this idea. The dust of Catania, Sicily, which was described by Silvestri and has been regarded as cosmical, Lasaulx has also investigated. His conclusion is that all the materials present in it could have been, and in all probability were, derived from Mt. Etna. A study of the residue by the melting of a large quantity of snow collected by the author in the neighborhood of Kiel, revealed no minerals for which anything but a terrestrial source need be predicated. In conclusion, Lasaulx decides that the atmospheric dust is in general to be regarded as terrestrial detritus, and that before a non-terrestrial origin can be considered proved in any case, a much more critical microscopic examination must be made than has been customary in the past.

THE SURVEY OF THE NORTHWEST.—Mention has been made of the projected scientific survey of the country tributary to the Northern Pacific railway and the Oregon railway and navigation companies' lines, under Prof. Raphael Pumpelly. The work, which will be organized for a term of years, contemplates mapping the country "on a published scale of four miles to the inch," in order to show the geological structure, the distribution of minerals, of the different varieties of soils, of plants and animals, and the climatic conditions. For the thoroughness and high scientific quality of it the director's name is a guaranty, but he has also associated with him a number of trained men from the United States Geological Survey, including Mr. Wilson, the able topographer of the Fortieth Parallel Survey. The classification of the lands of the railroad companies according to their fertility and their mineral and timber resources will, of course, furnish a rational guide to the extension of branches, and will have a wholesome effect in turning immigration into remunerative channels. The bulletin which the survey contemplates publishing will thus be eagerly consulted. Meantime, the Signal Service will welcome the new meteorological stations to be established in the pre-eminently weather-breeding section of the continent. In every way the country at large will profit by this nominally private enterprise, which anticipates the national exploration of the great northwest territory.

OZONE AT THE PARIS ELECTRICAL EXHIBITION.—The editor of *Les Mondes* has had a call from Dr. Tommasi, the distinguished Florentine chemist, who came to propose an idea to him that is worth publishing. The Palace of Industry is at present a place where there is in circulation, especially during the evening, an immense quantity of electricity. Now, under the special and entirely exceptional conditions presented by this vast closed space saturated with electricity, it may be that the atmosphere undergoes peculiar modifications; for example, there may be a production of a certain amount of ozone. It would be extremely interesting, then, to put up an apparatus for collecting the ozone from the air, and which should work continuously at the exhibition. Such an apparatus was proposed by Dr. Tommasi at London seven years ago. The moment seems to us opportune to perform these curious experiments. Dr. Tommasi is all ready to undertake them, but he needs for this the concurrence of some of our learned professors and the kind co-operation of the commissariat of the Electrical exhibition. We trust that neither will be lacking. Should these experiments take place we will inform our readers of the results obtained.—*Chronique Industrielle.*

SOUTHERN NEW JERSEY SINKING.—Prof. Geo. H. Cook, State Geologist of New Jersey, concludes that the land in Cape May and Cumberland counties is gradually but certainly sinking. From knowledge now in his possession he estimates that the surface has settled about eight ft. during the last 100 years. During a recent visit he declared it his intention to test the matter by placing stone posts in the ground at certain localities, a record of which should be kept so as to insure their being found at any future time, said stones to be so set and marked with reference to their hight above the sea level that it may be positively ascertained whether this portion of the State is becoming lower, and at what rate.

EXTINCTION OF ANIMALS.—According to the Paris *La Nature*, all of the larger animals the world over, including the lion, tiger, gorilla, giraffe, elephant, hippopotamus, etc., are rapidly approaching extinction. Some are hunted down for profit, some for pleasure, and many because they threaten the existence of man.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Oct. 20.		Week Ending Oct. 27.		Week Ending Nov. 3.		Week Ending Nov. 10.	
Alpha	3.80	3¼	4.40	3.90	4	3¾	3.95	3.80
Alta	4.55	4.35	4.40	3.95	4.35	4	5¼	4¼
Andes	1¾	1.80	1.65	1.55	1.60	1.45	1.60	....
Albion	2.40	2¼	2.30	2.05	2¼	2	2.40	1.55
Argenta	6c	....	5c	....	10c	....	....	....
Addenda	10c	....	10c	....	10c	6c	10c	....
Belcher	2	1.90	2.10	1¾	2.85	2.30	3¼	2.85
Belmont	....	....	40c	....	60c	55c	60c	....
Best & Belcher	13	12¾	12¾	11¾	12¼	11¾	12	11¾
Bullion	75c	65c	1.90	65c	1.95	1.70	1.80	1.60
Bechtel	75c	70c	75c	50c	55c	50c	60c	50c
Belle Isle	....	....	....	....	....	....	....	....
Bodie	8	....	7⅞	7¼	7	6¾	6¾	5
Benton	80c	75c	70c	65c	75c	65c	90c	70c
Bulwer	....	....	....	....	2.20	2	2¼	....
Boston	25c	6c	....	....	....	....	25c	....
Black Hawk	5o	....	....	....	....	....	....	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	10o	5c	25o	15c	45c	15c	40c	35c
California	95c	90c	90c	70c	80c	75c	75c	70c
Challenge	....	....	....	....	70c	....	85c	80c
Choller	2.65	2.45	2.40	2.05	2¼	2	2.15	2
Confidence	3½	3.45	3¼	3	3.65	3.35	3.95	....
Con Imperial	25c	20c	25c	20c	20c	....	20c	....
Con Virginia	2.55	2.45	2.45	2¼	2.40	2¼	2.35	2.20
Crown Point	1.85	1¾	2.05	1.90	2¼	1.85	2¼	1.95
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1¼	1	....	....	1¼	....	....	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	40c	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2.40	....	2¼	2.20	2.30	2	1.95	1.80
E. Mt. Diablo	20c	....	20c	15c	40c	30c	35c	....
Eureka Con	21¼	18	16	15	18	16¾	17¼	16¾
Exchequer	1¼	1.20	1¼	1.35	1¼	1.35	1.40	1.35
Endowment	....	....	....	....	....	....	....	....
Grand Prize	5o	....	5o	....	....	....	....	....
Golden Gate	2¼	....	....	....	....	....	....	....
Goodshaw	25c	....	35c	30c	35c	30c	35c	....
Gould & Curry	7¼	7¼	7¾	6¾	7¼	6¾	6¾	6¾
Hale & Norcross	3.40	3.15	3.20	3	3.10	2.95	3.60	2.95
Head Center	....	....	....	....	30c	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	15c	10c	10c	....	....	....	....	....
Julia	40c	10c	45c	40c	45c	40c	40c	30c
Justice	1¼	90c	95c	90c	1	95c	1.05	90c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2¾	....	2¾	....	2¾	....	2¾	....
Kosmith	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	20c	15c	15c	....	20c	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	1¼	....	1	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	1¾	....	1¾	1¾
Martin White	2.10	2.05	3.30	2.35	....	....	3¼	....
McClinton	....	....	....	....	....	....	....	....
Mono	3.35	2¼	2.20	1¾	1¾	1¾	3.35	1¾
Mexican	9¾	9¼	9¼	8	8¾	8	9¾	8¼
Mt. Diablo	5	....	6¼	5	7¼	6¼	6¼	6
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	20c	....	5c	....	....	....	....	....
Noonday	50c	30c	55c	25c	50c	40c	40c	35c
New York	10c	6c	15c	10c	10c	....	15c	10c
Northern Belle	11¾	11¼	12	11¼	12¾	11¼	14¼	12¼
North Noonday	35o	....	5c	....	25c	20c	10c	....
Navajo	50c	....	45c	....	40c	....	....	....
Occidental	1.40	1¼	1¼	1.30	1¼	1¼	1¼	1.10
Ophir	7¼	6¾	6¾	5¾	7¼	6¾	7¾	7
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.80	1.45	2.65	1.95	2.60	2.30	2.65	2.40
Orn	60o	40c	40o	30c	35c	30o	35c	30c
Paris	....	....	....	....	....	....	....	....
Potosi	3.10	2.35	2.90	2¼	2.70	2.45	2¾	1.95
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	10c	....
Savage	4¼	4.10	3.90	3.70	4	3.45	3.65	3.35
Seg Belcher	7¾	7	9	8	8¼	....	8¾	8
Sierra Nevada	16¾	16¼	15	13¾	14¾	14	16	13¼
Silver Hill	30c	25c	30o	25c	30c	25c	25c	20c
Silver King	19	17¾	19¾	18¼	20	19¼	19¾	....
Succor	....	....	....	....	....	....	....	....
Summit	20c	....	10c	....	....	....	15c	10c
Scorpion	1¾	1.70	1.65	1.45	1.60	1¼	1.60	1¼
Solid Silver	....	....	....	....	....	....	....	....
South Belle	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	40c	....	....	....	....	....	30c	20c
Tioga Con	30c	20c	20c	....	25o	20c	25c	20c
Tiptop	6¾	....	5¾	....	5¾	6¼	5¾	....
Tuscarora	10c	....	10c	....	....	....	....	....
Union Con	15	13¾	14	13¼	14¾	13¾	13¾	13
Utah	7¾	7¼	7	6¾	7¼	6¾	6¾	6¾
Ward	....	....	3	2¾	3	....	3	....
Wales	50o	....	40c	....	50c	....	....	....
Yellow Jacket	4.40	4.30	4.35	3¾	4.35	3.80	5¾	5¼

Sales at S. F. Stock Exchange.

Thursday A.M., Nov. 10.

1155	Alta	5¼@5	
290	Andes	1.60	
430	Belcher	.3¾@3.40	
300	Bullion	1.60	
700	Benton	.90o	
100	California	.70c	
730	Crown Point	.2.20@2¼	
150	Chollar	2.05	
700	Con Virginia	.21	
350	Exchequer	1.35	
350	Gould & Curry	.6¾	
340	Hale & Nor	.3.55@3.60	
100	Julia	.30c	
600	Justice	1.05	
200	Lady Wash	.20c	
525	Mexican	.9¾@9¼	
100	New York	.15c	
1350	Overman	.2.60@2.55	
320	Ophir	.7¼@7¾	
200	Potosi	.2	
540	Sierra Nevada	.16¾@15¾	
50	Savage	.3.45@3.40	
20	Scorpion	.1.60	
120	Utah	.7	
850	Union	.13¾@13¼	
390	Yellow Jacket	.5¾	

AFTERNOON SESSION.

416	Albion	.1.90@1.95	
350	Belmont	.65c	
505	Bodie Tunnel	.1¼	
270	Bodie	.5¼	
50	D Standard	.25c	
400	E Mt Diablo	.35c	
50	Eureka Tunnel	.2.35	
150	Goodshaw	.35c	
155	Holmes	.35c	
35	Mt Diablo	.6	
320	Northern Belle	.14	
250	Noonday	.30c	
200	N Noonday	.10c	
200	Oro	.35@30c	
100	Silver King	.19¼	
100	S Bulwer	.10c	
100	Syndicate	.25c	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Richmond Con., Nov. 5th, $20,831; Stormont, for Octoher, $30,207; Horn Silver, 6th, $2,500; Stormont, 6th, $6,174; Jay Gould Co., $2,150; Syndicate, 5th, $5,934; Silver King, 3d, $33,000; Western, 7th, $17,062; Christy, 31st ult., $4,172; Syndicate (for October), $11,720; Christy, 4th, $4,172; Syndicate, 5th, $5,934; Bodie Con., 7th, $6,198; Emigrant M. Co., 4th, $8,500; Betty O'Neil, 6th, $7,750; Christy, 6th, $5,173; Silver King, 3d, $33,000; Syndicate, 5th, $5,443; Bodie Tunnel, 6th, 200 ounces; Oro, 1st, $5,900; Head Conter, 4th, $7,426; Northern Belle, 31st ult., $7,626; Star, 29th nlt., $6,139; Eureka Con., 31st ult., $7,595; Monitor, 6th, $2,837; Tintic, 1st, $3,637; Barbee & Walker, 1st, $2,027; Milford, 1st, $2,000; Hanauer, 1st, $3,590; Jay Gould, 1st, $7,430; Bullion, 2d, $4 850; Horn Silver, 2d, $12,500; Hanauer, 3d, $1,800; Germania, 3d, $9,760; Stormont, 3d, $3,400; Horn Silver, 3d, $25,000; Barbee & Walker, 3d, $1,760; Tiutic, 3d, $2,888; Bullion, of Paradise, 2d, $1,936; Horn Silver, 4th, $15,070; Germania, 4th, $12,311; Great Basin, 4th, $4,580; Northern Belle, for week ending Nov. 2d, $22,090; for October, $86,724.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alexander M Co	Nevada	1	3 00	Oct 31	Dec 3	A B Cooper	328 Montgomery st
Black Hawk G M Co	California	13	10	Nov 9	Dec 17	Jan 4 H A Charles	419 California st
Bonanza M Co	Nevada	1	15	Oct 31	Dec 3	Dec 20 J B Treadwell	404 California st
Bodie Tunnel & M Co	California	5	50	Oct 20	Nov 24	Dec 21 C C Harvey	304 California st
Belcher M Co	Nevada	28	1 00	Sept 29	Nov 1	Nov 24 J Crockett	327 Pine st
Bostou Con	California	2	20	Sept 15	Oct 21	Nov 12 F D Luty	330 Pine st
Bullion M Co	Nevada	21	1 00	Sept 21	Oct 26	Nov 15 J M Braze	328 Montgomery st
Champion G & S M Co	California	9	25	Sept 19	Oct 25	Nov 15 B Burns	309 Montgomery st
California M Co	Nevada	2	10	Oct 4	Nov 9	Nov 30 E F Stone	306 Pine st
Caledonia M Co	Nevada	37	25	Sept 29	Nov 2	Nov 22 R Wegener	
Grand Prize M Co	Nevada	7	25	Sept 30	Nov 1	Nov 21 E M Hall	327 Pine st
Hale & Norcross M Co	Nevada	71	50	Oct 6	Nov 9	Dec 1 J F Liglitner	Montgomery st
Holmes M Co	Nevada	3	10	Oct 8	Dec 12	Jan 3 E A Holmes	313 Pine st
Lord of Lorn M Co	Nevada	2	10	Oct 8	Nov 17	Dec 19 R N Van Brunt	318 Pine st
Maybelle Con M Co	California	9	20	Sept 20	Oct 26	Nov 18 W J Taylor	1310 Pine st
Murchio G & S M Co	Nevada	7	15	Sept 7	Oct 11	Nov 10 Wm Letts Oliver	328 Montgomery st
Mexican M Co	Nevada	17	1 00	Oct 4	Nov 8	Nov 28 C L McCoy	309 Montgomery st
Mono M Co	California	14	1 00	Oct 4	Nov 9	Nov 29 W H Lent	308 Montgomery st
Morning Star M Co	Nevada	1	25	Oct 19	Nov 22	Dec 21 J B Moholm	331 Montgomery st
Mt Potosi M Co	Nevada	8	25	Oct 20	Nov 21	Dec 12 W J Taylor	330 Pine st
North Noonday M Co	California	4	25	Oct 26	Dec 1	Dec 23 W J Taylor	330 Pine st
Nooaday M Co	California	4	25	Oct 26	Nov 23	Dec 20 W J Taylor	330 Pine st
Ophir M Co.	Nevada	40	1 00	Sept 30	Nov 3	Nov 23 C L McCoy	309 Montgomery st
Overman Ns M Co	Nevada	51	50	Oct 17	Nov 17	Dec 8 G D Edwards	414 California st
Quartz Mountain M Co	California	13	75	Oct 7	Nov 14	Dec 5 E Heatris	729 Montgomery st
Savage M Co	Nevada	48	50	Nov 3	Dec 6	Dec 27 E B Holmes	329 Montgomery st
Sierra Nev S M Co	Nevada	70	1 00	Oct 6	Nov 10	Nov 29 E L Parker	309 Montgomery st
Tuscarora M & M Co	Nevada	9	15	Oct 17	Nov 22	Dec 14 M E Sperling	309 California st
Utah S M Co	Nevada	35	2 00	Oct 13	Nov 16	Dec 6 G G Pratt	309 Montgomery st
Union Con S M Co	Nevada	18	1 00	Oct 10	Nov 14	Dec 5 J M Buffington	309 Montgomery st
Yellow Jacket S M Co	Nevada	42	1 00	Oct 4	Nov 9	Dec 6 N Otey	

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Belvidere M Co	California	12	25	Sept 22	Oct 29	Nov 21	O V Hubbard 310 Pine st
Benton Con Co	Nevada	6	25	Oct 14	Nov 18	Dec 8	W H Watson 302 Montgomery st
Eintracht G M Co	California	8	05	Sept 27	Nov 2	Nov 19	H Kuntz 209 Sansome st
East Mt. Diablo	California	2	10	Sept 27	Oct 31	Nov 21	G W Fisher 324 Pine st
Goodshaw M Co	California	9	16	Oct 12	Nov 17	Dec 8	Chas O Harvey 309 Montgomery st
Homo G M Co	California	8	3	Oct 20	Dec 3	Dec 21	R Ellon 330 Pine st
Harringtou M Co	California	2	02	Jnn 15	Oct 14	Nov 5	O C Miller 409 California st
May Flower Gr M Co	California	18	10	Oct 12	Nov 16	Dec 7	J Morizio 328 Montgomery st
North Sierra Nev Co	Nevada	3	10	Sept 19	Oct 27	Nov 17	C O Harvey 309 California st
Rocky Point M Co	California	9	05	Oct 12	Nov 14	Dec 5	D M Kent 330 Pine st
Wide Awako M Co	Arizona	14	10	Sept 16	Oct 21	Nov 12	C Hildebrandt Bush & Kearny sts

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meetings.	Date
Peck M Co	———	Chas T Bridge	224 California st	Annual	Nov 17
Curtis Con M Co	Nevada	H S Stone	328 Montgomery st	Annual	Nov 11
Hillside M Co	Nevada	F Frankenthal	330 Pine st	Annual	Nov 17
Kentuck M Co	Nevada	D O Stewart	234 Montgomery st	Annual	Nov 23
Maryland Con M Co	———	E P Farnsworth	219 Sansome st	Annual	Nov 11
Mammoth Gr M Co	———	Wm H H Hart	230 Montgomery st	Annual	Nov 16
Yreka Creek G M Co	California	Chas Mawnor	31 Fremont st	Annual	Nov 16

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Sept 27
Father De Smet M Co	Dakota	H Dean	New York	50	Oct 10
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	50	Nov 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Nov 15
Silver King M Co	Arizona	J Nash	315 California st	25	Nov 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Nov 12
Tip Top M Co	Arizona	H Deas	309 Montgomery st	20	Aug 25
Western M Co	California	O S Curtiss	309 Montgomery st	75	Nov 10

The Mining Share Market.

There is nothing much doing in mining stocks, very little activity being shown. Good progress is now being made at all points along the Comstock. There are at no point either water troubles or serious troubles of any kind. The *Enterprise* says there will probably soon be assessments levied by the Savage, Hale & Norcross, Chollar and Potosi mines, for the purpose of paying for the big hydraulic pump at the Combination shaft, said pump having been accepted by the companies interested in it. The sooner this assessment comes and is paid the hettor for the stockholders. The amount to be raised by each company is not large. The dread of this assessment has for a long time kept down Savage, Chollar and the stocks of all the companies interested. Once this assessment is paid, persons will think nothing of paying $2 or $3 a share more for these stocks than the present prices, yet while it is impending all will hold aloof.

The receipts of hullion from the mines during the month of October were as follows: Bodie, $30,046; Bechtel, $19,041 94; Bodie Tunnel, $5,028.73; Christy, $28,634. Eureka, $115,-992.19; Emigrant, $16.000; Head Center, $18,-921; Northern Belle, $89,724.22; Oro, $8,228.-60; Ontario, $167,443.96; Star, $22,100.20; Standard, $164,632.08; Syndicate, $6,020 44; Silver King, $72,763; Wai Wera Consolidated, $6,866 99; Western, $94,262.64, making a total for the month of $865,705.99. The total for the month of September was $948,578.11; in August, 1,296,595.61; in July, $1,663,387.76; in June $1,425,885.42; in May, $1,078,354.15; in April, $1,125.383.81; in March, $1,134,-096.08; in February, $1,324,069 80, and in Jannary, $100,163.43, making a grand total of $11,933,146.08 for the first 10 months of 1881.

The following companies report a cash balance on hand November 1st: Alta, $28,729.52; Alpha, $4,441; Argenta, $1,520.46; Benton, $487.82; Bodie Con., $11,113.37; Bulwer,$104,-140; Belding, $923.82; Belle Isle. $2,367.03; Bechtel, $24,155.56; Chollar, $8,111.48; Challeuge, $559.75; Caledonia, $512; Crown Point, $31,991; Con. Virginia, $24,337; Donble Standard, $5,994.31; Gould & Curry, $9,103.24; Gen. Jackson, $7,524 91; Grand Prize, $1,-426.37; Holmes, $991.27; Imperial, $10,938.23; Julia Con., $9,261.62; Justice, $25,207.44; Lady Washington, $2,380.49; Mount Diablo, $173.33; North Belle, $91,680; Northern Belle Isle, $1,567,19; New York, $2,500; Standard, $349 914; Saratoga. $7,739.94; Silver Hill, $17,-658.93; Tioga. $13,414.32; Western, $3,303 11. The following were named in debt: Best & Belcher, $1,381; Bullion,$50,000; Betty O'Neal, $4,576.46; California, $23.652; Day, $74,407.-92; Hale & Norcross, $4,500; Mono, $166.36; Overman, $5,246.40; Potosi, $12, 347.71; Sierra Nevada, $29,875; Union, $19,149.31; Utah, $7,398. The Bullion Mining Co. has $85,787.17 resources to meet the above indehtedness and the Octoher expenses at the mine. California as $9,141 unsold bullion.

Meetings and Elections.

Western M. Co., Nov. 7. Directors: A. K. P. Harmon (President), John H. Boalt, John F. Boyd, D. C. Bates (Secretary) W. S. Marks.

A resolution was adopted forming a new company, to be known as the "Contention Consolidated mining company," with a capital of $12,500,000; divided into 250,000 shares. The formation of the new corporation involves the consolidation of the Western, Flora Morrison and Sulphuret. The apportionment is made as follows: Western to receive for its mine 200,000 shares; Flora Morrison to receive for its mine $32,000; Sulphnret to receive for 600 ft of the southerly end of its mine 18,000 shares.

The Western declared a dividend of $1 per share payable on the 10th inst., and there will be another final dividend in settlement.

The gross product of the Western mine is given at $1,502,742 39. It has paid $900,000 in dividends during the past year, and the dividend declared yesterday will bring the amount disbursed up to a round million.

POPULAR SCIENCE MONTHLY.—The *Popular Science Monthly*, for November, fully holds its well earned reputation of being the best magazine in the country for the sonnd education of the people. There is never a page of trash in this sterling publicatioo. All its numbers in all the 20 years of its existence have heen good ones. Its articles are always able, instructive, fresh and repleto with original thought. Herbert Spencer opens the present number with an article on "The Industrial Type of Society," the eleventh in his series on "The Development of Political Institutions." "Volcanoes, their Action and Distrihution," is a very valuable article, profusely illustrated, and designed to correct many popular errors in regard to volcanic phenomena. Dr. Felix L. Oswald continues his papers on "Physical Education," the present number being devoted to the topic of "Hygienic Precautions." The many extracts which have been given from these papers in the columns of the PRESS cannot have failed to impress upon our readers their great value. "A Half Century of Science," an extract from the address of Sir John Lubhock before the late meeting of the British Association for the Advancement nf Science, gives an interesting resume of scientific progress for the last half century. Those interested in "other worlds than ours," will he especially pleased with an article hy Francis Brigham on the discovery of "Organic Remains in Meteoric Stones." The present number is embelished with a finely executed portrait of Geo. J. Brush, of the Sheffield Scientific School, accompanied with a brief sketch of his life. The various minor departments are well filled with a good variety of instructive and useful reading. New York. D. Appleton & Co. $5 per year, 50 cents per number.

ARTESIAN WELL TUBES.—In the last numher of the PRESS we described a constrnction of artesian well tubes as having been patented by Benjamin Roberts. The name was incorrect. It was B. R. Norton, of Alameda, who obtained the patent.

WHILE hydraulic mining is, for the present, quiescent, gold quartz mining will receive a new mpetue in California.

MINING SUMMARY.

The following is mostly condensed from journals published in tho interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

PURCHASED.—Amador *Sentinel*, Nov. 2: The Monterichard mill has been purchased by the company working the Owen Kelley mine, and will be transferred to the latter point. A 60 inch flow of water burst out in this mine on Friday eveuing, necessitating a few day's suspension of operations.

AMANOR GRAVEL CLAIM.—This claim, located two miles east of Jackson, is to be started up for a final effort to hunt up a paying lead. For over a couple of years mining has been carried on, with brief intervals of suspension, at a loss to the stockholders. It seems no pay-dirt has been struck to amount to anything so far. The stockholders, however, have determined to pungle up a few more thousands to fossick around the ancient river bed supposed to lie in that vicinity. If the search thie beat prnves fruitless, it is probahle that the river of geological times will be let severely alone by the stockholdere henceforth and forever.

EMPIRE.—Of this mino nur Plymouth correspondent writes: Last Saturday, ou the night shift, 125 buckets of ore were taken out through the south shaft. Ono hundred tons of rock extracted from the north side of the mine have been crushed at the mill. How it yielded I am unable to say.

PACIFIC.—On the 80th nf Octnber the station was finished and on the following day drifting was started, and more men were put to work. Plymouth is increasing in population every day.

MEDIAN.—A clean-up of the test run of ore from this mine was made at the Talisman mill this week. We are not able to give the exact yield, but it is eo satisfactory that the stamps were put in motion again as soon as the clean-up was completed. The outlook is favorable for a permanent and paying mine.

MISCELLANEOUS.—The shaft of the Maryland is down 400 ft, and drifting for the ledge has commenced with encouraging prospects. We have heard nothing further concerning the developments of the tunneling operations at Murphy's ridge.

OLETA ITEMS.—Mining has been started with energy in every direction. Purington & Clark are working a large force of hands on their gravel claims at American flat and vicinity. B. Bacon has recommenced work on his claim. Mr. Bacon has made some good clean-ups in the past. The Bradegon brothers will commence work soon.

VOLCANO.—The Golden Gate hids fair to become one of the permanent mines of the county. Sinking is progressing, and good rock is being taken from the shaft. The works are in first-class order. The lode widening as the shaft descends, and the ore growing richer. Supt. J. W. Moyle is at the Bay at present. The Downs mine continues to produce rich ore, of which there appeare to be no limit. The mill will soon be erushing again, as water is beginning to appear in the d tches. This will add much to the output of the precious metal from this section. Robt. Stewart's mine, on the Mokelumne river is taking out richer ore than ever; the ore works at the mill from $18 to $75 per ton. The mill is running constantly. The Volcano G. G. M. Co. will have completed by Saturday, a 7-ft flume, designed to carry the waters of the South Branch creek over the excavation at the mouth of the tunnel, which will prevent the filling up in case of very high water. It is a fine piece of work, and substantial. Supt. Barling has put in a regular railroad trestle bridge which suports the flume.

CALAVERAS.

WEST POINT.—Cor. Calaveras *Chronicle*, Nov. 5: The mining district of West Point is blooming out at last. From every point we hear of new developments, and also a number of new strikes, which, taken as a whole, give this place a prominent part in the gold mining interests of California. 'Tis true not half of our mines, or say one-quarter, are at present being worked, but those that are, fully deserve to be brought before public notice in order to encourage the prospecting of those mines that are at present idle. From the Champion mino we hear good news. A vein of quartz has been struck in the bottom of the 700-ft winze which measures 6 ft across it and prospects at the rate of $60 per ton. The owners are jubilant, and intend to increase their present working force. The Florida mino is also making a splendid showing under the supervision of Mr. Ferguson. The 190 level has been carried farther in, and quartz of exceeding richness has been found; a new pay chimney has also been struck on the south side of the present working shaft, about 150 ft from the present workings. The quartz shows plenty of gold and sulphurets, and it appears, in both this mine and the Champion, slate formation is beginning to appear as depth is attained. Mr. P. Bushman has struck a fine body of quartz at Camp Flores. The vein is 3 ft wide and all pay rock. Reuter & Eberhardt have also struck rich quartz in the Blazing Star mine. Smith & Co. have been putting up an engine on the Pride of Bummerville mine. W. Moore & Co. are taking out rich rock from the old Bowers claim. W. Steger & Co. are also taking out good quartz from the Anna mine; about 20 tons on dumps. The owners of the French lode have struck "ounce" rock in the bottom of their shaft.

BULLION.—I made inquiries, and for a few of which I can give a correct account of the amount of gold bullion produced in and around this district during the past two weeks:

Champion mine	$6,000
Riverside	900
Constitution	816
Jackdaw	632
McGee	510
L. Morse mine	442
Mexico	355
Pride of Bummerville	300
Whiskey lode	816
Blazing Star	300
Total	$11,161

Besides this quite a number of smaller amounts both from placer and other sources have been taken out, the quartz from the above mentioned mines averaging $60 per ton.

EL DORADO.

THE SPRINGFIELD MINE.—*Mountain Democrat*, Nov. 9: This noble mine, the mainstay of Mud Springs township, is just now looking and paying better than at any period of its prosperous career. The tunnel on the 700 level has opened up two pay chutes, larger and richer than the same chutes were on the upper levels. There are four of these rich chutes or clumneys that have been worked on upper levels, and there is no room to doubt that the other will in due time be reached on the 700 level. A tunnel is also being run on the so-called 900 level, though the actual depth of this level is about 080 ft. This tunnel, it is calculated, will reech the first of the pay chutes in about 200 ft. In the meantime the mill is pounding away on rich ore and making satisfactory returns. The current opiuion of the neighborhood is that a large share of the success of the Springfield mine is due to the sound judgment and indomitable energy of its Supt., L. R. Poundstone.

FRESNO.

ENTERPRISE.—Mariposa *Herald*, Nov. 5: At present there are a great many mines, but very few mills for crushing purposes in this section. Parties with capital could not invest in anything that would pay better than a good mill for crushing custom rock.

A PARTY of English capitalists from San Francisco were up last week looking at the Gambetta mine, and talk is that a sale was made for $150,000.

MINE SOLD.—We are informed that the Amee mine, situated between the Enterprise and Ellen mines, Grub

Gulch district, Fresno county, has been sold to Warren Luce, of San Francisco.

Bio Strike.—French Joe, a man well known in the vicinity of Fresno Flats went out prospecting a few days ago, and brought in a bathful of very rich rock said to contain about $2.0 to the bat. He won't tell where he found it.

Work has been resumed on the Butterfly mine, a good piece of mining property that has been lying idle for some time. It is owned by Thompson & Collins.

Mill Running.—The Enterprise mill has started up, and at present there is plenty of water. The recent rains in that section were very heavy, and prospects are there will be a sufficiency of water to run the mill until the rainy season sets in.

INYO.

Mexican.—Bishop Creek *Times:* The Mexican mine, situated on the south side of Redding's canyon, about 8 miles distant from Bishop Creek, and owned by Jake Ekeles, Jose Maria Portella and Francisco Cantuar, made a very rich strike on Saturday last at a depth of 10 ft. The ledge encountered is 5 ft wide, with 3 ft of ore that assays from $200 to $300 in gold, and $100 in silver. The owners are jubila t over the strike, and say they would not take $30,000 for the mine at the present time. The strike was made in the incline, which they propose to sink immediately to a depth of 80 ft, before running crosscuts to ascertain the extent of the ore body. They also have a tunnel in a distance of 15 ft, the face being in a ledge 5 ft wide, and which assays from $20 to $25. An arastra is kept running which yields enough to pay all expenses of developing the mine.

Gold Hill.—Wm Crapo, of Cerro Gordo, is about transporting some 10 or 12 tons of ore from the big Gold Hill ledge, situated about a mile north of the old Lower Town, to the arastra west of Lone Pine, for working for gold. It will be expensive, but the ore is rich and apparently inexhaustible.

Virginia Con.—Mr. E. Chenot, Supt. of the above mine, which is situated on Kearsarge mountain, has several men at work taking out ore. An average sample sent to the Independence assay office yesterday yielded gold, $32 01; silver, $175.93, total, $208 54.

Gold.—The owners of the Keynot mine at Beveridge, have shipped during the past month $18,000. The run will last until the 10th of this month, when they calculate to have $15,000 more, making $30,000 for the month, or $1,000 per day.

The Average Yield —The Keynot, or Mexican mine, is still yielding ore sufficient to run a 20-stamp mill, and the ledge is increasing in size, as well as in richness. The shipment, from 9 tons of ore per day is now averaging $1,000.

Work.—The old Fish Spring arastras are about to be started up on ore from the new gold ledge, recently discovered by Herne, in the Sierras to the southeast of the placer diggings west of Big Pine.

As Work.—The Taylor mill in Beveridge district, is running night and day upon Keynot ore, and with its five stamps crushes 9 and 10 tons of rock every 24 hours.

The Laura.—Inyo *Independent*, Nov. 5: We have been shown some very fine samples of ore taken from the Laura, in Beveridge district, assaying from $225 to $500 per ton. About 100 tons of ore are on the dump, which will net over $10,000. In this whole country, so vast, and rich in its mineral resources, there is at present no better or more promising prospect than the Laura. The ledge crops out in bold relief along the entire length of the claim, and is rich paying rock from the surface. Considerable developments have been made.

The Montezuma.—The Montezuma, or what is better known as Billy Lake's mine, situated in the Inyoa opposite Fish Spring, is under bond, some $500 of the purchase money paid for it, and active work of development is going on. Mr. A. H. Griswold, a mining man of long experience, has this enterprise in charge, representing a strong San Francisco company. The ledge, or deposit, shows an enormous outcrop of argentiferous galena, and to open it by sinking is an easy going thing

NEVADA.

Chanoko Hands.—San Juan *Times*, Nov. 5: It is rumored that the American company's mining property has changed hands; that on Monday last the property was transferred to the Yuha tunnel gold mining company, a corporation—such is the rumor. Whether true or false we know not, but this we do know, that if true, the Yuba Co. have an elephant on its hack which only requires, in our humble judement, the down off a goose's back to break to pieces. We think that the Yuba Tunnel Co. had experience enough not to again enter into this enterprise of mining, especially in the locality of the American mine. It is true the present stockholders of the Yuba Tunnel Co. are not the same men that sold out to the American Co., but nevertheless they cannot put gold in ground where there is none. If it he true that the property has changed hands, we will congratulate the members of the American Co. for ridding themselves of an incubus. The ground will for a time perhaps pay water money and expenses of working, and that's all.

PLACER.

North Fork Dam.—Placer *Herald*, Nov. 5: We learn from S. Washburn, superintendent of the Bear River, North Fork and Gold Hill ditches, that the fine, large, new dam on the North Fork of the American river, at the head of the North Fork ditch, nearly opposite Auburn, is substautially completed. The last work, except a few finishing touches, having been done last Saturday. By those who have seen it this is said to be a very fine structure. A large force of men have been employed in its construction nearly all summer, and it is gratifying to know that it has reached that stage which renders it safe against any unusually early flood that, any seaon, is liable to occur.

The Mining Situation on the Forest Hill and Iowa Hill Divides.—A gentleman who has spent the summer on the Forest Hill and Iowa Hill Divides, and who in that time has visited all the mining camps of that region, including Forest Hill, Michigan Bluff, Iowa Hill, Wisconsin Hill, Damascus, Canada Hill, Yankee Jims, Todd's Valley, Sunny South, Deadwood and Last Chance, reports that portion of Placer county in a very prosperous and promising condition. Most of the mines are paying well, and various recent developments are of a decidedly encouraging character. At Last Chance all the mines are paying. At Deadwood the miners are cheerful and say their claims are behaving nicely. The Weeks mine, near Michigan Bluff, is at present doing very well, and the Baker Divide in the same locality, a new claim, is showing very encouraging prospects. At Canada Hill, Johnny White is fitting up the Reed claim for drifting, with every assurance of big returns. Snyder & Hobson on their claim near the Secret House, are putting things in shape with confidence of flattering returns. The Hidden Treasure at Sunny South is too old, extensive, rich and reliable to need comment. The Mountain Oate at Damascus, now in the large, new, blue chanuel, is paying better than it ever did. The Succor Flat drift mino, near Wisconsin Hill, is, as usual, doing well, and in short, all over those two divides, our informant says, much money is being taken out and the prospects for more are very hopeful. He had never been much in that region before, but he thinks it are exceedingly rich country, and is of the opinion, (which is shared by many old miners) that its wealth has but yet been grazed.

An Important Mining Project.—Flanagan & Shaddock have been at work most of this last summer in fitting up a hydraulic elevator on the Middle Fork of the American river, a few miles above Auhurn, near what has been known as Hoosier Bar. Besides the labor necessary for the work they have spent a good deal in necessary pipe and machinery. They are now, we understand, after several experiments, running steadily, and our information is that they are finding the ground in the hed of the river very rich. If this enterprise proves a success, and the present indications are that it will, the old river beds of California which contain millions will inovitably become again the scene of active operations. All that is needed is to get at the wealth ths rivers contain, and if this hydraulic elsvator can supply ths need, it will prove a great thing. It will work a revolution.

PLUMAS.

Going for Bedrock.—Plumas *National*, Nov. 5: Mr. Mills has a boring machine at work at his shaft in the valley, and the anger is making rapid progress toward bedrock. This will determine the depth, and the character of the ground, and when bottom is reached it will be easy to calculate on the cost and necessary machinery for the working shaft.

Elizabethtown.—Messrs. Corbin & Manson are pushing their work along at a lively rate, and are reported doing well. The upper works are in good paying gravel, and the prospects in the lower shaft are improving daily, giving substantial reasons for thinking that the pay lead goes down the flat. If they demonstrate that, they have got a claim that will last a lifetime.

Jackass Mine.—Mr. Bell has been prospecting in the extension of the Jackass quartz ledge for some time, and has a shaft down 18 or 20 ft, showing the vein about 7 ft wide. The rock prospects well, and occasionally a piece shows free gold; There is no doubt but that this ledge will be a permanently good one, and we hope it will be thoroughly developed The owners intend to tap it at considerable depth from the Black Hawk side of the mountain, and work in the tunnel will commence in a short time.

SIERRA.

Results.—*Mountain Messenger*, Nov. 5: The result of last week's mining at the Extension mine, 6 men working on a shift, was 84 ozs of gold, worth nearly $1,600. One piece weighed 20 ozs, and several weighed from 1 oz to 3 ozs. Owen Thomas, of Eureka, thinks the future prospects of the mines in his locality were never more promising than now. Chas. F. Byrne, superintendent of the Truckee mine, near Rocky Point, Sierra county, came into town Monday and will remain during the winter. The mine has been closed down, and operations will not be resumed till spring.

TRINITY.

Waiting for Water.—Trinity *Journal:* Most of the miners in Trinity county now have their claims prepared for winter work and only await the coming of water to commence active operations.

NEVADA.

BRISTOL DISTRICT.

Ore.—Pioche *Record*, Oct. 20: Messrs. Gilmer, Salisbury and party last week made a thorough inspection of all the leading mines in and around Bristol district, and were decidedly pleased with what they saw, particularly so in the Tempest and Mayflower, where, in each, there is over 10,000 tons of ore in sight worth at least $50 per ton, or $500,000. The Day mine was also examined and pronounced by all to be one of the leading mines in the State, and, judging from the immense amount of ore in sight, Mr. Gilmer said he saw no reason why the Day, in time, shouldn't be on a dividend paying basis.

Mayflower.—Another large body of high-grade ore was encountered in the Mayflower last week while running the east drift from bottom of winze No. 1. It is from 7 to 8 ft wide, and runs all the way from $125 to $200 per ton. The sum of $200,000 was offered for the mine 10 days ago and refused, and since the finding of the new body of ors, which has increased its value two-fold or more, the Bristol Co. would probably take no less than $750,000 for the entire property.

Suit for Damages.—The Bristol S. M. Co. has commenced a suit for damages against W. E. Griffin, J. V. Keeley, Sheriff McKee, Deputy Sheriff Craig, O. Sherwood and George S. Sawyer for the sum of $54,000, for attaching and holding their property.

There is renewed activity in prospecting here, and numerous old claims will this winter be worked and opened up. The Day furnace is daily turning out 5 tons of bullion averaging from $350 to $430 per ton.

CANDELARIA DISTRICT.

Mount Diablo.—*True Fissure*, Nov 3: In the north crosscut from the east drift, from the bottom of winze on the third level, there is a low-grade ledge in the face. The north crosscut from winze No. 3 is in 67 ft and shows a favorable formation in the face.

Northern Belle.—The shaft levels have shown no change of note but are looking full as well as at the time of last report. The usual amount of work is being done in the adit and the levels above. Eighty-six tons of ore are being extracted and sent to the mills daily. Both mills are running steadily, mill No. 1 on half time. Bullion shipments for week ending Nov. 2d, $22,090 13. Total shipments on October account, $86,724 22.

Metallic Equator.—A full force of men is at work, and everything about the mine is running at top speed. The shaft is being sunk and good progress made daily. On the 400 a station has been cut out and a crosscut started. The station is large and roomy and sufficient for all work that may be done from it into any of the adjoining country. The new donkey pump and engine is working like a charm.

The Holmes.—Work is being carried on with vigor at this mine and fair progress is made daily. Fourteen men are employed in and around the mine, and they all seem to be moving in a hurry.

COOPER DISTRICT.

Another Discovery.—*Ward Reflect*, Nov. 2: Tom Sutherland and N. B. Dunton discovered a ledge in Cooper district last week, between Coopor pass and Steptoe creek, ore from which assays $180. They are well pleased with the prospect and work will be commenced at once.

DUN GLEN DISTRICT.

Auburn Mill.—*Silver State*, Nov. 1: The building for the C. O. M. Co's. mill at Dun Glen is completed, and the machinery is being put in place as rapidly as circumstances permit. Supt. Hodges expects to have 10 stamps running early in December. Much of the machinery is here yet, as it is hauled to the mill only when wanted, and the millwrights are prepared to put it in place.

EUREKA DISTRICT.

Important Strike.—*Sentinel*, Nov. 6: On Thursday last, in the Richmond mine, between the 6th and 7th levels, an extensive cave was discovered, which contains a vast amount of the richest ore ever struck in the mine. The probabilities are that it will exceed the celebrated Potts' Chamber. The company are to be congratulated upon their recent finds.

GRANTSVILLE DISTRICT.

Closed Down.—*Bonanza*, Nov. 5: Orders came from San Francisco on Thursday evening to suspend operations in the mine and mill of the Alexander Mining Co. At the time of closing the mines never looked better. How long the mines will remain shut down is a mystery too hard for outsiders to solve.

PIOCHE DISTRICT.

No Men Wanted.—Pioche *Record*, Nov. 1: Men in search of employment will do well not to come to this vicinity in search of that article. At the present time our labor market appears to be well supplied. There have been a number of strangers straggled in from Utah and Montana lately.

STAR DISTRICT.

Ooon Returns.—*Silver State*, Nov. 5: A carload of ore shipped by Peter Woolcock from the De Soto mine at Star, about two weeks ago, assayed $750.31 to the ton. That is a very fair average even for the De Soto.

TAYLOR DISTRICT.

Two and a-half tons of ore from the June mine at Taylor, were recently shipped to Eureka for reduction that went 233 ozs. to the ton, as shown by returns received Friday last.

Sale of Mining Property.—Robt. Briggs Saturday last purchased Esau P. Weaver's interest in the Breechloader mine, for $1,000.

The ore now being extracted from the Monitor mine is reported to be much richer than any yet put through the mill.

Another Sale.—Theodors Webb yesterday purchased one-fourth of the Juue mine, from John Murphy, for $250.

WARD DISTRICT.

Martin White.—*Ward Reflect*, Nov. 2: The superintendent's letter says: All work is going on well, and we are taking out some fine ore. In a short time I shall have most of the ground secured, when I can put more men on ore and in following out some very fine streaks. My object is not to take out a large amount now, but to so open up the mine that we can take it when needed. We are getting some rich ore as ever came out of the mine. The people of Ward have somehow got it into their heads that the ore body encountered is marvelously rich, and in that respect no mine anywhere approaches it, also that the ore body is very large, but, of course they don't know it for a fact. The superintendent is evidently more than satisfied with what is in sight, but prefers to underestimate rather than make a mistake on the other side.

WASHOE DISTRICT.

Ophir.—*Enterprise*, Nov. 6: The joint Mexican east drift on the 2000 level has been extended 25 ft. During the week 202 tons of ore have been extracted from the croppings, and 210 tons have been shipped to the mills.

Sierra Nevada.—The joint Union Con. east winze, 2700 level, has been sunk and timbered 8 ft. The west drift from this winze has been extended 25 ft; the joint east drill hole has been extended 210 ft.

Union Shaft.—Still rotimbering the drift running to the Sutro tunnel on the 1000 level, casing timbers at the 2000 station and cutting out a bob pit at the 2000 level.

Con. Virginia —We are still opening out and repairing drifts and winzes connecting with the old Con. Virginia shaft.

California —On the 2700 level the joint Ophir east drift has been advanced 25 ft.

Mexican.—In the Union Con. east winze a station is being cut out at the 2700 level. Have completed the new line of compressed air pipe in the main lateral drift.

Union Con —In the joint Mexican east winze are cutting out a station at the 2700 level. The joint Sierra Nevada west drift has been extended 25 ft, and the joint Sierra Nevada east drill hole 210 ft.

Yellow Jacket.—The north lateral drift, 3000 level, was run 21 ft, making length of same 03 ft from north winze. The drill hole west at foot of north winze is in 150 ft. Drilling shows quartz and porphyry. No change in quantity of water pumped.

WHITE CLOUD DISTRICT.

White Cloud Copper Mines.—*Silver State*, Nov. 4: E. C. Asher, Jr., of Lovelock, informs us that W. S. Bell, of Oakland, has purchased nearly all the mines in White Cloud district owned by George Lovelock and Joseph Organ. These mines are situated about 35 miles east of Lovelock, and are very extensive, and carry a high percentage of copper.

ARIZONA.

Important Sale in Tombstone.—The most important event in mining circles since the consolidation of the Flora Morrison and one-half of Sulphuret with Contention, is the purchase by the Boston mill company of the Stonewall mine, the deed for which went on record yesterday. The consideration paid for the mine was $100,000, and is considered a good investment at those figures. The company knew just what they were getting by the purchase, having worked several tons of the ore, which has given a return of $80 per ton. The mine is so far opened that it is safe to say they have the full purchase money in sight, with an assurance that as greater depth is attained and the full length of the ledge explored, they will have a mine that will rank with the bonanzas near town. This mine is located about 1½ miles south of town, at the point of intersection of the Merrimac mineral belt with the Tombstone belt proper. The Tombstone belt starts in at the San Pedro river and continues on in an unbroken course direct to the big wash north of town and possibly, as many good experts argue, clear through to the Dragoons. The Merrimac belt comes in at almost a right angle and abuts up against the main belt at or near the Stonewall. The course of this lode, as also that of the Contact, a few hundred yards farther south, is nearly due east and west. It is a true contract vein lying between lime on the north and quartzite on the south. The ore is an oxide of manganese, carrying green horn silver, and works perfectly free.

Globe District.—*Silver Belt*, Nov. 3: Stonewall No. 1 is developing into a reliable mine. It is not giving fancy assays but it is working 37 ozs to the ton. The vein is never small, and at times widens out to 12 ft, all of it milling ore. It is remarkably free, working up to 996 fine without refining. A strong stone wall has been erected back of the smelter to carry the dump and feed platform. The road has been finished to the platform. The road to the Illinois No. 1 mine is nearly finished. The working shaft on the South Pioneer is down 100 ft. It was started about 80 ft from the vein, and west of it. The vein has a westerly pitch of about 45°. At 93 ft a small stringer of quartz carrying ruby and other silver minerals was encountered, which, at 100 ft has widened out to 12 inches of ore possessing the same characteristics as the main vein, with the addition of polybasites, the same as the Silver King's. General McDonell is making rapid progress on his copper works. The roof is on the engine house, the assay furnace finished, the machinery all set, and the foundation for the derrick finished. The pump has been tried and works admirably. There will soon be a sale of the McCormack Co.'s mine and plant.

COLORADO.

Dunderburg.—Silver Plume *Coloradoan*, Nov. 3: We are glad to be able to give even a few items of information of what is being done in this mine. It is putting out the usual amount of ore and the grade is increasing in quality. One hundred and twenty men are employed. New ground is being opened by drifts and shafts in proportion to the amount exhausted in stoping, thus always keeping reserves sufficient to employ a full force of men in breaking down and taking out ore, a model which all of our large mining companies should follow, as on this principle depends in a large degree the future productions of the mine. By working on this principle the Dunderbarg is, and will continue to be one of our most steady ore producers. The present production of the mine averages about 115 tons per month, sometimes going as high as 130 tons The company are putting up an additional ore house 30 by 14 ft.

Shively.—Below the 255 level they are sinking on 2 inches of ore, the second-class milling 400 ounces and third-class over 600 ounces. They are also raising a mill hole for ventilation, in which they have 1 inch of ore of the same grades as above; 13 men are employed.

Stevens.—Shaft sinking is the order of the day here, which the workmen are doing on 1 foot of ore. The shaft is 4 by 12 ft. The engine is now in place and working well.

Atlantic and Pacific Tunnel.—Reports have been in circulation that work had ceased on this enterprise. We are glad that we are authorized to contradict them.

Tip Top.—This is one of the numerous locations made in the neighborhood of Gray's peak during the past summer. This one was located by Roberts Bros. & Co., and is a strong vein on the east slope of Gray's peak, and was taken up as a galena lode, the discoverers thinking the time would come when a mine of this kind would be valuable. To their surprise they found that the rock carried 36 ounces of silver, and the prospect is that it will be valuable for present working. The crevice is fully 7 ft wide, and the rock is evenly interspersed with mineral from wall to wall.

IDAHO.

Eureka Gulch.—Idaho *Messenger*, Nov. 3: The Atlanta has been worked more or less for the past 2 years, and is from 8 to 14 ft in width, and contains ruby and sulphides and sulphates of silver; the ore or pay streak in the vein varies from 2 to 6 ft in width; the value of which runs from 150 to 600 ozs per ton. The company are going to work 5 men on this mine during the coming winter, and have already laid in supplies to the amount of 9,000 lbs. and built 2 houses. The Idaho, situated about 300 ft easterly from the Atlanta, is a parallel vein, with similar qualities and formation; but in width ranges from 12 to 20 ft.

Beaver Gulch.—In this gulch, which is also on Beaver creek, are located a number of mines, one of which is the Ruby, of which the mammoth is an extension on the east. The Ruby is opened by surface cuts and 1 tunnel.

South Boise.—The Silver Shield and Baltic, belonging to the same company, are located across the main divide of the Sawtooth range on the North Fork, which is a tributary of Boise river on Bear creek.

Wood River Bullion.—Wood River *Miner*, Nov. 3: The Philadelphia Co.'s smelter at Ketchum, is turning out about 15 tons of bullion per day, which is shipped to Blackfoot as fast as teams can be procured. Last Thursday afternoon 66,000 lbs were shipped, and 44,000 lbs more were shipped Saturday morning, making a total of 110,000 lbs in less than 2 days. From Blackfoot the bullion is taken direct to the home office of the company in Philadelphia. After the first reaches there other lots should be received every two days. Nothing else is so convincing to the average mining operator as a pile of bullion bars, and nothing is more calculated to cause inquiry into the source of production than such a sight. These shipments of bullion will therefore do this section a great deal of good.

Sawtooth.—Cor. Wood River *Miner*, Nov. 3: Freighting has entirely ceased, and if the present stormy weather continues it will be impossible to finish the Columbia & Beaver stamp mill until spring. It is understood that Supt. Owen, after finishing the stamp mill for the Columbia & Beaver Co., is to erect a mill for the Mountain King and Vienna mines.

Work on the mines will be continued through the winter. Also, on the Pilgrim, Solace, Vienna and Mountain King. Mr. James Richardson has charge of the Pilgrim, Mr. Wallace of the Solace, Mr. Johnson of the Mountain King and Vienna mines. The snow is 3 ft deep in Smiley gulch, and business outside of the mines is entirely suspended for the season.

MONTANA.

Cora.—Butte *Miner*, Nov. 7: The shaft of the Cora is down some 215 ft, and the men are now engaged in retimbering with a view to beginning sinking deeper. Just at present no ore is being taken out.

Magna Charta.—Some 58 or 60 men are now busily at work in the Magna Charta, sinking below the 300 level, and taking out a great deal of ore. Yesterday Mr. Hall took Profs. Blake and Maynard through the mine.

The Alice.—The Alice is shut down for the purpose of overhauling the boilers, etc.

The Original Butte.—There are very slight changes in the condition of this mine since the last report. The hoisting works building is almost completed, and is now receiving a coat of paint. No sinking has been done for two weeks.

The Original.—Stoping is still going on in the east and west drifts at the 200 level, and the mine is looking well.

Dagnon.—Operations are progressing steadily and satisfactorily, with a good quality of ore and plenty of it. Stoping is being done between the 225 and 300 levels.

Morgan.—Operations were shut down yesterday for one day only, to adjust the spur wheel, which arrived on Friday from the house of Griffith & Wedge, Zanesville, Ohio. For several days past a full force has been working in the mine on the 200 and 300 levels. On the 400 and 500 levels nothing has been done on account of the water, which was lowered in the main shaft some 4 or 5 ft in the 24 hours ending yesterday morning. Stoping is proceeding regularly on the 200 and 300 levels, the regular quantity of ore, some 20 to 25 tons, being taken out daily.

NEW MEXICO.

Cow Spring District.—*Mining World*, Nov. 5: There are some excellent properties being developed in Cow Springs district. The veins are well defined in granite. On the surface they are only 12 inches wide, but at a depth of 25 ft, increase to a width of 3 ft. The ore is principally a sulphuret, and is high grade.

The Victoria mining district, two miles from Gage station, on the Southern Pacific, promises very rich. A number of St. Louis capitalists are largely interested in the mines. They have purchased a smelter which will be shipped to Victoria at once. Good claims command fair prices and many of the owners are not waiting to sell, but are going down on their prospects.

Part of the machinery for the 40-stamp mill to be built at the old Santa Rita copper mines is now on the ground and the balance on the road. The adobes and bricks, 100,000 of each have been contracted for to build additional furnaces, some 4 or 5 in number, which are already in course of construction. A force of some 200 men are now at work at these mines and the number will soon be increased to 400.

OREGON.

Mineral Resources.—*West Shore*, Nov. 3: The mineral resources of Jackson county, although its mines have been continually worked for 29 years, are far from being exhausted, and, indeed, it is only within three years that efficient hydraulic machinery has been introduced. The Sterling mine, owned by Capt. A. P. Yankony, of Portland, and Mr. Frank Enuis, the latter gentleman being superintendent, is without doubt, the most valuable placer mine in Oregon. It was opened several years ago at an outlay of $100,000; although its yield is not definitely known by the public, the property is valued by its fortunate owners at $2,000,000. The mine is situated on Sterling creek, about 8 miles south from Jacksonville, formerly one of the richest mining camps in the county. It is estimated that 50 years will be insufficient to work all the ground owned by the company. Another large hydraulic mine, paying handsomely, is owned by a Chinaman on Applegate creek; and still another owned by the Squaw Lake mining company on the same creek, will soon be in working order, and promises handsome dividends. The aggregate yield of golddust in Jackson county, since the discovery of the mines in 1852, is estimated by the best authorities at about $30,000,000, and it is said that by the aid of modern appliances and powerful machinery the mines will produce quite as well in the future.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Washington Drift G. M. Co., Nov. 5. Location, California. Capital stock, $500,000, in 50,000 shares. Directors: O. O. Francis, Abraham Halsey, C. W. Hendal, Ralph Plumb, L. R. Tuttle. The last named party owns 49,980 out of 50,000 shares of stock, the others 5 shares each.

Smith Manufacturing Co., Nov. 5. Object, to manufacture and sell agricultural implements, and to acquire patents and rights for improved machinery, and to manufacture and sell the same. Directors: Solon Pattee, W. J. Bevan, W. O. Richardson, Budd Smith and Daniel Buck. Capital stock, $600,000.

Redwood O. & S. M. Co., Nov. 3. Location, California. Capital stock, $5,000,000. Directors: Henry Raymond, M. A. Miller, Frederick Hotaling, S. S. Stambaugh, Elon Dewitt

Lost Treasure M. Co., Nov. 8. Location, Arizona. Capital stock, $10,000,000. Directors: William Sherman, William H. Lent, William Willis, George W. Osborne and George Congdon.

Polonias Placer M. Co. Nov. 8. Location, Los Angeles Co. Cal. Capital stock, $10,000,000. Directors: E. W. Skelton, Earl Bartlett, Theodore Reichert, H. Kelham and I. N. Thorne.

Oakland City Water Co., Nov. 8. Capital stock, $1,000,000, in 100,000 shares. Directors: W. R. Andrus, O. J. Dennison, J. A. Robinson, J. E. Bletben and Charles S. Kennedy. It is said that the supply of water is to be obtained from Summit House and ex-Mayor Bryant's ranch.

Camp O. & S. M. Co., Nov. 9. Location, California. Capital stock, $1,000,000. Directors: John Rebman, W. A. Beal, John A. Morris, E. A. Hatherton, J. T. Ohetwood.

"Grubstaking."

The Law about Verbal Grubstaking Agreements.

Judge Hallett, of the United States Circuit Court, in session at Denver on the 17th ult., rendered the following important decision:

Sarab E. Johnstone *vs.* Robinson, *et al.* Decision on final hearing. Hallett, J.

Sarah E. Johnstone, a married woman, and Mary A. and Ellen W., her infant children, filed a bill in the District Court of Arapahoe county against the unknown heirs of Charles Jones, to compel the conveyance of certain interests in mining property in the county of Summit. Afterwards George B. Robinson and the Robineon Con. mining company, who had acquired Jones' interest in the property, were made parties to the suit. On the death of Robinson, his heirs and perhaps his personal representatives were substituted for him as defendants, and the bill is now pending against those parties. The theory of tbe case, as advanced in the bill, is that Mr. Joncs, having been engaged with Mrs. Johnstone's husband in the San Juan country in the year 1877 in prospecting for mines, agreed with Mrs. Johnstone that if he should be brought out to Denver by ber or her husband, and kept bere during the ensuing winter, and furnished with an outfit for prospecting in the spring, that he would give to her and her children one-half the property which he should acquire during the summer, or that they should be interested with him in some partnership relation to the extent of one-half of what he should acquire during the summer.

It is alleged in the amended bill that all tbese things were done—that is to say, that Jones was brought to Denver, and kept during the winter, and furnisbed with the necessary outfit in the spring, and in the oourse of the summer that he acquired the property in which the plaiutiffs claim to have an interest, and which they wish to have decreed to them in this suit.

There is some evidence toshow that Jones was brought to Denver, pursuant to the agreement, and kept here during the winter by Mr. Johnstone. It may be assumed that the fact is proved, and as to the furnishing him with an outfit in the spring, there is testimony that some money was given to him at the time when he was about to start to Leadville, the amount of which is not shown; also some blankets and some clothing. It is not claimed that anything more was furnished him—provisions or tools, or animals, if any were necessary. As to that matter, then, it may be said that the proof is not full, doee not establish a compliance by the plaintiff, Mrs. Johnstoue or her husband, with the agreemeut.

Jonee went on to Leadville, and there, after sometbing of a spree, and idling around for some time, and making eimilar arrengements as to prospecting with at least two other parties, he went out in the interest of Mr. Robinson, or parties who were associated with Robinson, he himself being one of them, in an effort to discover mines. The mines in controversy here were discovered sometime during the summer, Jones baving in the discovery, by the terms of the agreement with Robinson and others, an interest of one-fourth, or eomething like that, in the locatious so made.

It is to secure one-half that interest so acquired by Jones under an agreement with these other parties, not with the plaintiff in this suit or any of them, but with other parties, that this suit is prosecuted. Jones died in the autumn of that year, and the bill was brought against his unknown heirs, these other parties becoming defendants afterwards.

Upon that statement of facts, I deem it only necessary to say that in my view the partnership relation, or if it be not called a partnership relation, but by some other name, the associabetween parties who may he engaged in prosecuting explorations in the public lands for mines, must exist at the time of the alleged discovery and location, in order to give to the parties associated an interest in the property. If it does not then exist, so that the person acting in the field, making the discovery aud the locatiou can be said to he acting for the otbers as well as himself, no interest can be acquired by those who are not personally present. Complainant's counsel seem to have felt the force of that rule, and tbey sought to establish the existence of this relation by Jones' admieeions msde by him at different times through the year to the effect that he expected to give some interest to Mrs. Johnstone and her children, or that tbey held some interest as discoverers. But that, I think, is not eufficient. Conceding that such admissions may have been made, and I think the evidence establishes that they were made, that is not sufficient to overcome the strong circumstances of the case. Mr. Jones had agreed with other parties, whose names I do not now recall, to go upon a prospecting expedition for them or to allow them to stand in iuterest with him. He wns a man of diesipation, and, ae ehown by the evidence here, in the habit of drinking about all tbe time when he could find anything to drink that would produce drunkenness, and for that reason I ehould say that not very much importance ehould be attached to his statements. But if we ehould give the greatest weight to them, the weight that would be attached to the declarations of a eober man of deliberate waye and habits of mind, I doubt whether it could be said that one having made one arrangement or agreement with certain parties to act witb them in eecuring mines, and afterwarde making another agreement witb other parties, and going apparently in pursuance of the last agreement, with the means furnished by his latest associates, could he said to be acting under and in pursuance of the firet agreement. I do not believe that tbat inference would be a fair one. If several persons associate themselves together by agreement to go out aud discover mines, and some of them furnish the meane of prosecuting the enterprise, as provieions and tools, and the like, and others go out and contribute their labor, and each party performs his pait of the agreement according to its terms, it is clear enough from the conduct of the parties—as well as their declarations that tbey nre acting in fullbillment of their contract and agreement, whatever it may be; but when this agreement is apparently abandoned, and eome new arrangement is made bstween new parties, and means are furnished hy some of them as arranged in the first instance, and others go out in the prosecution of the joint enterprise, any one would eay upon that circumstance alone, that they are acting under and in pursuance to the last agreement, and not the firet. And that is the situation of affaire here. I do not thiuk that it is open to discnssion even, that Mr. Jones, at the time he made these discoveries, was acting under hie arrangement with Mrs. Johnstone. He had abandoned that, as he had abandoned everything else apparently, within a day or two after it was made, and taken up with this new idea with the one who came to him last and furnished the necessary articles for prosecuting his enterprise; and it ie not to be inferred from that that what he did at that time is to bs taken as done in pursuance of the origiual agreement at all.

His acquisitions during this time, as ho got only a small interest in the property, must he taken to have been made for himself, and these plaintiffs were not interested in them at all; and whatever remedy they would have against him or his representatives for his breach of contract, they would have no right whatever to the property which he might acquire when acting under this new arrangement, this new agreement with Robinson and his associetes.

That is the strong reason in my mind which will enforce a decree for the defendante in this case.

This bill will bs dismissed and the defendants will recover their costs.

Bullion Camp.

The Bullion mine received some hose and other material for the hoisting works on Wednesday last. This mine, the Mayflower, Jay Gould, Eureka, and in fact all the minee now being worked in Bullion camp, are running all the hands that can be employed to advantage and rich ore is being piled on the dumps at a rate eurpassing any former time. Owing to the rise in freights there will be very little more ore shipped thie fall, the owners of the various mines preferring to let it accumulate on the dumps and wait for the low freight which can be secured next spring. It is rumored that the proprietors of a few of the largest producing mines in Bullion will club together and put in a big smelter at the month of Bullion gulch early next season. The site is a good one, being near the miues, only a short distsnce from timber and having good transportation facilities for its bullion over an almost dead level road all the way to Blackfoot nn the Utah & Northern railway, a distance of about 135 miles. The freight at present on ore from the mines in and about Bullion to the railroad is from $27 to $30 per ton and will probably increase as cold weather approaches and grezing along the road becomes poorer. Extensive preparations have been made for working the Bullion, Mayflower, Eureka, Jay Gould, Idahoan and O. K. mince during the winter. There are also a number of prospects being opened up in the vicinity which will be worked regardless of snow and cold. Some of these newly developed properties have very fine showings and a large amount of ore piled on the dump. We ehall look for an ontput of ore next epring from this group of mines many times greater than that of the entire season now drawing to a close. Other camps on the river tributary to Hailey are preparing for extensive work this winter and with the disappearance of enow we reasonably expect an increase in all branches of business far in excess of that enjoyed during the first few weeke of the boom which last spring was the making of three prosperous towns on Wood river.—*Wood River Miner.*

When a Location Can Be Relocated.—As many locators of claims are in douht as to when the annual assessment work must be done, the Gold Hill *News* furnishes the following important information: A miner making a location this year has until January 1, 1883, to perform the necessary labor, and the claim cannot he jumped and held before that time. It is untrue that the "jumping" eeason dates from the location of the claim, or, in other worde, that if a mine ie located on the 27th of October, 1881, it can he jumped on the 27th of October, 1882, if it has not received the assessment work. The law was made to protect the poor man. A miner, without means, locating a valuable claim on the 31st of next December, could hardly perform $100 worth of labor before the morniug of Jsnuary 1, 1882. The "jumper" muet wait until January 1, 1883.

The antimony minee near Lovelock etation, Nevada, belonging to Meesrs. Emmons & Jonee, are giving promiee.

Bisbee.

The Great Copper Camp of Arizona.

We take the following from the *Tombstone Epitaph*:

It ie with great pleasure that we are enabled to record another triumph among the mining industries of our county. A little less than a year ago the Neptune Mining Co. of Arizona filed its certificate of incorporation and immediately went to work developing its copper properties situated at Bisbee in the vicinity of the famous Copper Queen mine. After a careful investigation of the water supply at Bisbee the company decided to locate its smelting works upon the San Pedro river, aud purchased 600 acres of lend, being n part of the San Rafael grant. The land of the company extends upon both sidee of the river. On the weet side the town of Hereford wes laid out, and is bountifully supplied with fine spriugs several of which gush up from the soil, and at this point add materially to the body of water in the San Pedro. Those of our readere who have visited Bishee will remember Hereford as being one of the finest situations in the whole valley of the San Pedro.

About 500 yards from the east bank of the river the bottom lend terminates abruptly at the mesa, and upon the edge of the mesa the Neptune smelting worke are erected. The main building is 44 ft. by 34 ft., and consists of the engine-room and boiler-room. The engine is 60-horse power, and was built by Prescott & Scott, of San Francisco. The boiler is huilt in brick work, the bricks being made upon the land of the company about 250 yards from the emelter. To the right of the engine-room is the furnnce-room. This building ie 30x 30 ft. The furnace is a 30-ton sectional water-jacket, and was designed by August Rahl. Tracks are laid upon each side of the furnacs upon which a car is rnn and conveys the molds to the embankment from which the copper ie loaded. Immedistely bshind the furnace-room is the ore-room, being 30 by 30 ft., with n wide platform extending in the rear for the reception of ore. A 40-ton crusher is placed in the ore-room. This crusher is one of Blake's improved, and is one of the most powerful ever used. To the left of the ore-room is the sample-room, also containing a small Blake crusher. Behind the sample-room is the immense tank, containing 20,000 gnllons. The water is pumped into this tank by a powerful Cameron pump, and thence distributed to the works as required. The water is taken from a reservoir immediatcly at the foot of the mesa—being conveyed to this point by the gravel etrata underlying the bottom land from the river to the mesa. One hundred yards from the ore room is situated the office of the company, adjoining which is the assay office of the superintendent of the smelting works.

The Ores

Are hanled from the mines at Bisbee, 18 miles distant. The first run ie to be made at the smelter, on Saturday, and the dumping of the slag-pots will hereafter nightly illuminate Hereford, and become qnite a landmark to the traveler, and Mr. Herring puts down his run for the first 30 daye at a minimum of 300,000 lbs. of copper. As this company has never made any attempts at newspaper brag, we msy eafely credit the accomplishment of this resnlt. Some of the ores from the mines of the company are enormously rich, notably so the Uncle Sam and Neptune. While this company has not developed any great deposit like the Copper Queen, they have gone eteadily forward with tbeir development, and the manager reports 1,000 tons of ore now ready to be hauled to the furnace—not merely in sight, bnt on top of the ground, and that the indications of continuance are good. The reeulte already attained have required an enormous amonnt of labor and perseverance, and we wish the Neptune enterprise every snccess.

Burro Mountains as a Mining Camp.—From the earliest history attainahle through the archives of Mexico, the Burro mountaine have been looked npon as one of the richest silver mining camps in existence, and now comes the proof of their knowledge: First, the old mines owned by Givens & Irwiu, from which milling tests have run $164 per ton in silver, surrounded by a gronp of mines with assays rnnning high in silver, principally in chloridee; then the Silver Bell, owned by Crawford and others, carrying native silver and ohlorides running high in silver; aleo coppsr mines of a high quality of ore. Sand carbonates are found to the eastern part of the mountains, along a low range of hille and in the flats, eome 8 miles in length and 200 to 300 yards in width, assaye running as high ae $28 per ton. These carbonates are principally owned by Judge Ewing, and J. N. Moor, from Kansas City, who have commenced work to test the value of the claims; and they feel very sangnine they have gennine sand carbonstes. A new district has been laid out and called the Carson district, near Cherry Creek etation, and shows well ae far ae work has been done.—*New Southwest.*

The Nevada *Daily Transcript* saye: A good deal of prospecting is still being done at the old Meadow Lake diggings, and it is now reported that a ledge containing rich free milling ore has been found.

The Denver *Railway and Mining Gazette* highly compliments the mining machinery made by the Pacific Iron Worke of thie city. California mining machinery cannot be beaten.

San Francisco Fire Department.

The *Golden Gate*, a periodical published in Chicago devoted to insurance matters, and circulated among insurance people, in a recent issue publishes the following: "Nearly every large city claims to have the 'bset fire department in the world,' and the desire to make good the claim has led to a greater degree of excellence than wonld otherwise have been attained. Mr. C. F. Mullins, the able etatistician, has recently been gathering some figures bearing on the disputed question, and has exhibited the record of Boston, New York, St. Louis, Chicago and Philadelphia, as follows:

1877 TO 1880 INCLUSIVE.

	Number of Fires.	Insurance Involved.	Loss to Insurance Companies.	Per Cent of Loss to Insnce.
San Francisco...	1,259	$10,440,311	$ 1,242,242	11.90
Chicago	2,362	20,023,034	3,059,212	15.20
Boston.....	1,585	16,205,433	2,762,951	17.05
New York	4,676	66,051,218	11,861,829	17.70
Philadelphia....	3,080	25,940,142	4,611.132	17.79
St. Louis.....	1,207	11,475,177	3,774,177	32 85

"We have added San Francisco to the tables prepared by Mr. Mullins, to show that it heads the list of cities named in point of small ratio of insurance to loss involved. Fire Marshal Durkee, and Capt. White of the Fire Patrol of San Francisco are entitled to very great credit for the efficiency in their survice."

Chief Engineer, David Scannel shonld have been mentioned in the item and we add his name as he is head of the department which is so efficient.

Globe District.

Looking back over the last four years, we do not see a single marked success in mining in this district, but the Mack Morris. Since that mine became the property of the Mack Morris Co. Major Baldwin has been indefatigable in his efforts to make it a paying concern. It will eoon be a dividend producer. The secret ie that he brought the necessery knowledge combined with business ability of a higb order. Mejor Baldwin could not make ore wbere there was none, to be sure; but he can make what there is tell for all its worth. He has in his mine and mill as good men in their respective lines as the country prodnces; but be ie the presiding genine of the whole concern.

Thsre are a dozen prospecte in thie district that have a better showing tban the Mack Morrie had, with tbe eame development, that have gone by the board through incompetency and gouging.

Vale, the days of chicanery, of poverty stricken corporations, who burst up on the thresbold of success, of incompetency and puffery! All hail, the dsy of honest, intelligent and able management!

We spoke of the Carrie last week as a nonsnccess. It is measurably correct—the company have a good plant, and the True Blue mine ie said to givo a good ehowing of ore. If so the elements of snccess are thero.—*Silver Belt.*

That etannch advocate of American sbips, the *Nautical Gazette* relatee the following: One of the Monarch Line steamers came into this port a few weeke since, with a broken propeller wheel. To save time ehe was fitted np by the Morgan Iron Works with a spare one cast for the *Newport*, of the Ward Line, which was about 18 inches smaller than her original propeller. The owners intended to remove it ae soon as she reached Eogland, but to their surpriee, she mnde the run home in two days less time than she ever had done uuder the most favorable circumstances. It was concluded to let the "Yankee" wheel remain in position, and back she came at a rate of speed thet surprised everybody, and convinced her master, engineers and owners, that American mechanics did know eomething. We are satisfied that if we had such opportunity for practice in the building of large steamere ee the Clyde people have, our mechanics could produce craft that would outspeed even the famous *Arizona* and *Elbe*.

A New Mining District.—Reports bave come in from several different sources, that good qnartz had been struck near the headwatere of Man's creek, in Washington county. This week, Mr. Morris Kartzsr, whom we formerly knew in Baker City, Oregon, esme into our office and told us that he had been prospecting the past summer in the Man's Creek mountains. He eays that 22 lesds have been located in that eection. J. M. Packwood and Chas. Grim, Joseph and Robt. McCord, Chas. Huffman and Chaunoy Gone, Geo. Huffman and himself, have all located claims. Some of the claims carry a good deal of copper, hnt it ie principally eilver quartz. Tho veine are large and well defined, and many nf them run eeveral hnndred ouncee in silver. It is about 10 milee up the mountains from Snake river. M. H. Reed hae taken up a water right at the junction of Monroe and Man'e creek for a eawmill. There is plenty of timber and water eufficient to work the minee, and Mr. Kartzer thinke it will eoon develop into a good mining camp.—*Idaho Statesman.*

The Texas emelter of the California district, Arizona, is running out lead and eilver bullion. During the last 10 daye, 80,000 lbs. have been run, valued at $12,000. It will be ehipped direct to the lead works at Pittsburgh, Pa.

The Engineer.

Use of Glass for Engineering Construction.

A revolution in the common use of materials is promised by Mr. F. Siemens, who is at the present time making arrangements for the production in this country, on a large scale, says the London *Journal of Gas Lighting*, of his special make of toughened glass. This material has for some time been manufactured in Germany, and with the most satisfactory results; but it is believed that in England even greater facilities exist for its establishment as a regular industry. The method of manufacture is as simple as the reduction of iron-stone, and the annealing process, instead of being a separate and costly addition to the ordinary routine, as with the system of M. De la Baste, is as strikingly direct and economical as it is efficacious. The finished material may be made of any degree of fineness, and colored or enameled like ordinary glass, from which it differs chiefly in being practically unbreakable. Gas lamps glazed with Siemens' glass cannot be broken by the most violent storms, and pebbles thrown with force against panes will rebound harmlessly. It is said that the lamps along a promenade in Hamburg were regularly broken every winter by storms of sleet, until the tough glass was used, whereupon this destruction was no longer experienced. Other qualities of material are used for rail and water main pipes. These articles are much stronger than iron castings and imperishable and incorrodible. It is said that common castings, which are now procurable at prices which do not return the iron founder more than the barest profit or none at all, can be produced in Siemens' glass at about twice the figure, giving ample profit to the manufacturer. As the specific gravity of glass is only about one-third that of cast iron, the purchaser will be able to obtain glass articles at about 33% cheaper than similar goods in cast iron, as he will get, say, three pipes for the weight of one cast iron piece of main. It should be remarked that the Siemens' glass does not crumble to powder or break explosively when it is crushed, but cracks in precisely the same manner as cast iron.—*Industrial News.*

Survey of the Mokelumne.—C. D. Rhodes, civil engineer connected with the U. S. Engineer Corps on this coast, has, under instructions from Col. Mendell, completed an examination of the Mokelumne river from Woodbridge, the head of navigation, as declared by law, to deep water at the confluence of the Mokelumne and San Joaquin rivers, covering both forks of that stream. The principal obstructions found by Mr. Rhodes were above Staten island, or between the latter and Woodbridge. He made a sketch of the river, locating all the obstructions to navigation, snags, overhanging trees, etc., and reported the same to Col. Mendell, his superior officer. West of Staten island there is little to be done, and between that point and New Hope, the principal obstructions occur. Mr. Rhode's report is based on a thorough examination of the stream, and is officially submitted to Col. Mendell. What action will be taken in the premises remains to be seen. The improvement of the navigation of the San Joaquin and Mokelumne rivers is a matter that deeply concerns the people of this section. It is estimated that something over 70,000 tons of freight annually would be carried from that section were the Mokelumne in a navigable condition.

The East River Bridge.—That great bridge over East river from Brooklyn to New York will prove an expensive luxury. With the meager figures with which the trustees favor the public, the *Commercial Bulletin* has computed that the interest at rates from four to seven per cent. on the $13,799,900, which the stupendous structure has thus far cost, amounts in round numbers to $2,000 per day. The estimated cost 15 years ago, when it was commenced, was $3,000,000, the hight to be 200 ft. The hight has been reduced to 135 ft. and the cost increased to nearly five times the original estimate. The *Bulletin* does not think the bridge will ever pay. "The whole thing," it says, "is a job fastened upon the cities jointly by politicians and speculators."

From Rome to Naples.—The Italian Minister of Public Works has given orders for the surveying of a direct railroad line from Rome to Naples, as was proposed nine years ago by Danise. When the road is finished travelers can make the journey between the two cities in 3½ hours, or about half the time now necessary. Strategical considerations also have a bearing on the building of the line which will practically bring the important fortresses of Cannæ and Gaeta nearer each other.

The St. Gothard Tunnel.—It is believed that at last the engineers have mastered the quicksand formation in the St. Gotbard tunnel under Andermatt, by means of granite vaulting, and that the great work will be finished next month.

Electric Lighting is in successful operation on more than 60 steamers of the Mississippi river and its tributaries. It is believed to add much to the safety of that kind of traffic and traveling.

Useful Information.

New System of Glazing.

Rendle's patent system of glazing without putty or cement, which has been in practical use in England and the Eastern States for quite a while, promises to come into favor in Chicago and the West, whenever and wherever it is introduced. The conservatory curvilinear upon the premises of Mr. Wilbur F. Storey, on Grand boulevard, has been covered under the personal supervision of Mr. A. E. Rendle, the inventor, and the work is of a character that at once commends itself for excellence of finish and practical utility. In general terms, the special advantages the Rendle system claims over others may be summed up as follows:

The glass is placed in horizontal metallic grooves and fixed on wooden or iron purlins; the wood work and iron work completely covered and are not exposed to the influence of the atmosphere; if a pane of glass is broken, it can be replaced without trouble or expense, as it moves freely in the metal grooves; no putty or cement is used; it is economical, light, durable, and elegant; the patent grooves carry off the condensed steam on the inside as well as the water on the outside; the roof is very strong, yet as the panes are lapped one over the other and connected at the sides by only narrow strips of zinc, the entire surface has much the appearance of an unbroken sheet of glass; and last, and greatest of all, there is no breakage from expansion or contraction from heat or cold. Putties roofs can never be free from dampness by vibrations; yet roofs put on by this system are so elastic as to be almost entirely free from danger from that cause. The system has been quite generally adopted by English railroads for depots and stations, and is coming into use for the same purposes in America, as well as for conservatories, studios, exhibition halls, etc.

How to Furnish a Bed-Room.—A bed-room should impress the observer with the idea of a dainty cleanliness reigning supreme in every part of it, while the prevalence of cool, soothing tones of color suggest repose and rest. The paint might be delicate chocolate, the walls soft pea green; no color equals green for giving rest to the eyes, and in its paler tints it offers a pleasant sense of coolness during the most sultry days of summer, while they are free from the suspicion seen in many of the gray shades commonly used. Light colors make a room appear larger than the dark shades. Woodwork painted chocolate and cream walls, look well with bright blue furniture coverings and curtains, or maroon paint and citron wall with deep blue. A wall of a pale tone of blue and sage green woodwork will harmonize with furniture coverings bearing a design of autumn-tinted leaves. Stained boards are without doubt best for bed-rooms. A square of carpet covers the center, leaving three ft. clear all around the room. Dust invariably collects under furniture and chairs; dresses and drafts of air sweep it up into the corners; but the boards, being without covering, allow of its being easily taken up with a duster. Then, too, the carpet being simply laid down, there is no difficulty in the way of its being often shaken; no tacks have to be taken out or heavy wardrobes moved, so that there is no possible excuse for its being left down until the dust accumulates thickly.

To Harden Finishing Varnish.—A newly varnished carriage is liable to spot. To prevent this, some wash the carriage in clean, cold water applied with a sponge instead of using a hose; this will help harden the surface, and prevent it to some extent, from being injured by the mud or water getting splashed on the job. Never let mud dry on the surface and then wash off expecting to see no spots on the varnish. You will certainly be disappointed, and the only way to remedy the evil will be to have it revarnished. Soft water is better than hard water for the washing of carriages, as the lime which is in the hard water is very liable to injure the varnish.

Chinese White.—It is not wise to buy Chinese white in tubes. As we have often explained to correspondents, it may be kept moist in bottles, if a few drops of clean water are added each time any of the white is taken out. When the white rubs off your work it is a sign that there is a deficiency of mucilage, which is easily remedied by the use of a little gum Arabic.

Sugar in Milk and Butter.—Good sweet milk contains one-fourth more sugar than butter. This sugar turns to acid, and if this acid is too much developed before churning the coveted aroma is lost.

To Remove Ink from Furniture.—If ink has been spilled over rosewood or mahogany furniture, half a teaspoonful of oil of vitriol in a tablespoonful of water, applied with a feather, will quickly remove it.

Vegetable Germs in Arsenic.—Says the Boston *Journal of Chemistry*, the vegetation that sometimes forms in solutions of arsenic can be avoided, according to Perschne, by replacing one-fourth of the water with glycerine.

The Hair.—The microscope shows the hair to be like a coarse, round rasp, but with the teeth extremely irregular and ragged.

Railroad Signals.

The strange and dangerous dissimilarity of railway signals in this country has often been referred to, and the subject is brought forcibly to mind again by an interesting diagram in the *Travelers' Official Guide*, showing the whistle signals now in use upon about 200 lines. This indicates that, with the exception of the signal for backing, consisting of three short whistles, there is no signal in use having the same meaning on all roads, while no less than 40 different meanings are conveyed by several signals. According to this table, about 90% of the roads use one whistle for applying the brakes and about the same proportion use two short whistles for releasing brakes, while on others these sounds have exactly the opposite meaning. The signals for road crossings, sending out flagmen, recalling flagmen, calling for switchmen, calling attention to flag on engine and to railroad crossing, denoting that train has parted, calling for fuel, etc., differ widely; in fact, the code is based solely on the arbitrary fancy of the officer of each road. It is unnecessary to repeat that not only inconvenience, but often actual danger results from this dissimilarity of signaling, especially from the fact that railway men in this country are nomadic in their tendencies and wander from one road to another, so that the force of habit may lead to serious errors. All railway officers will agree as to the desirability of securing greater uniformity, but the trouble has been how to arrive at it. We are glad to observe that the new association of American railroad superintendents has appointed a committee "on train rules and signals," to report at the next meeting in April, and it may be that this association will furnish the means of bringing about the desired reform.—*Railway Press.*

Precious Metals Used in a Year.—The value of gold consumed by manufacturers during the last fiscal year was $10,000,000—more than $3,000,000 of which was in United States coin. The consumption of silver was equivalent to $300,000.

Ashes as a Fertilizer.—Ashes are, for many soils, a standard fertilizer. Places where a tree or brush heap has been burned often show the effects of the manuring for years. It is an old saying that "The land never forgets ashes."

Good Health.

The Diphtheria Plant.

In an address delivered a few weeks since before the Academy of Natural Science at Philadelphia, Prof. Horatio C. Wood announced as the result of recent investigations, that diphtheria was propagated "by a microscopic plant or fungus, existing in all human beings, especially in the mouth and throat, but lacking the power of reproduction until given increased vitality by those disordered conditions of the mucous membrane which attend sore throat when caused by a cold."

The investigations were made at the instance of the National Board of Health, and were extended over considerable time and in diverse localities. Prof. Wood proceeded to state that in all blood there are two kinds of corpuscles—the red or color giving, and white. By careful study and experiments, both in human beings and the the lower animals, it was found that this infinitesimal plant fastens upon the white corpuscles and multiplies its cells, altering their character, until with the interior destroyed they burst, and the plants, set loose in an irregular mass, separate and go off individually, to continue the destructive work on other corpuscles. Thus increased, they poison the blood, choke the vessels and are found in myriad numbers in the spleen and bone marrow, where the blood is manufactured. Prof. Wood's investigations show that the false membrane supposed to invariably indicate the presence of diphtheria, may be caused by ammonia, Spanish fly, or any other irritating influence in the throat, so that its presence is not infallible as indicating the existence of this disease. But in any case, the false membrane is built up by this parasitical plant, which grows and multiplies upon its inflamed surroundings, whatever may be its cause. It is when the plants grow strong enough to extend to the blood, either poisoning it themselves or carrying the poison with them, that diphtheria sets in. The little plant is exactly the same as found upon a coated tongue.

When Prof. Wood put plants such as found on a healthy tongue, in sterilized water, they failed to grow. On the contrary, plants from the throat or blood of persons affected with diphtheria multiplied rapidly. The practical result of the investigation pointed out, was the possibility that diphtheria, if existing theories prove good, may be prevented by artificial vaccination. In the case of splenic fever, caught from animals, which has been proved to originate in a somewhat similar plant, Pasteur has found that the plant, when exposed a sufficient time to the air, by the action of oxygen loses its poisonous character, and when then introduced into the system makes the animal sick, but is no longer fatal. The deduction is, that this diphtheric plant, scientifically known as "micrococci," may in time be cultivated so that when inoculated with it the system will no longer be subject to the disease in its fatal form.

Hurried Dinners.

It is a mistake to eat quickly. Mastication performed in haste must be imperfect even with the best of teeth, and due admixture of the salivary secretion with the food cannot take place. When a crude mass of inadequately crushed muscular fiber, or undivided solid material of any description, is thrown into the stomach, it acts as a mechanical irritant, and sets up a condition in the mucous membrane lining, that organ which greatly impedes, if it does not prevent, the process of digestion. When the practice of eating quickly and filling the stomach with unprepared food is habitual, the digestive organ is rendered incapable of performing its proper functions. Either a much larger quantity of food than would be necessary under natural conditions is required, or the system suffers from lack of nourishment. Those animals which were intended to feed hurriedly were either gifted with the power of rumination or provided with gizzards. Man is not so furnished, and it is fair to assume that he was intended to eat slowly. We must apologize for reminding our readers of facts so familiar; but we do this in the hope that any who may chance to have influence with the managers of large hotels where dinners *a la table d'hote* are in vogue will take measures to bring about a much needed reform in the manner in which these entertainments are conducted.

At the best and most frequented establishments in places of fashionable resort, where multitudes of health-seekers are wont to congregate, the hurried dinners are not only causes of annoyance, but actually go far to prevent the benefit which should be derived from a change. No sooner is one course served than another is introduced, without giving the guest time to digest or even to swallow the first. The eagerness to secure good dividends takes a particularly mischievous form when it piles food on the plate of a customer, and compels him to consume it breathlessly. The matter may seem a small one, but it is not so. Just as a man may go on for years with defective teeth, imperfectly masticating his food, and wondering why he suffers from indigestion, so a man may habitually live under an infliction of hurried dinners, and endure the consequent loss of health, without knowing why he is not well, or how easily the cause of his illness might be remedied.—*Lancet.*

Dread of Death.—Age, that lessens our enjoyment of life, increases our desire for living. Those dangers which, in the vigor of youth, we had learned to despise, assume new terrors as we grow old. Our caution increasing as our years increase, fear at last becomes the prevailing passion of the mind, and the small remainder of life is taken up in useless efforts to keep off our end, or provide for a continued existence. Whence, then, is this increased love of life which grows upon us as with our years? Whence comes it that we should make greater efforts to preserve our existence at a time when it becomes scarce worth the keeping? It is that Nature, attractive to the preservation of mankind, increases our wish to live, while she lessens our enjoyment; and, as she robs the senses of every pleasure, equips imagination in the spoil. Life would be insupportable to the old man who, loaded with infirmities, feared death no more than when in the vigor of manhood; the numberless calamities of decaying nature, and the consciousness of surviving every pleasure, would at once induce him with his own hand to terminate the scene of misery; but happily the contempt of death forsakes him at a time when it could only be prejudicial, and life acquires an imaginary value in proportion as its real value is no more.—*Goldsmith.*

A Natural Death.—Natural death is to die sweetly, without a sob, a struggle or a sigh. It is the result of a long life of uninterrupted health; of a long life of "temperance in all things," and such a death should be one of the ends and aims of every human being, so that we may not only live long, but in that long life, be able to do much for men and much for God. The love of life is a universal instinct; life is a duty; its peril or neglect a crime. We are placed on earth for a purpose; that purpose can be none other than to give us an opportunity of doing good to ourselves and others; and to be anxious to be "off duty" sooner than God wills, is no indication of true piety. The good man has one ruling, ever-present, desire, and that is to live as long on the earth as his Maker pleases, and while living, to do the utmost he can to benefit and bless mankind, and to accomplish a long, active and useful life. The study how to preserve and promote a high degree of bodily health is indispensable. And it seems to have been ordained by a Providence both kind and wise, as a reward of a temperate life, that such a life should be largely extended; that its decline should be as calm as a summer's evening; as gentle as the babe sleeps itself away on its mother's bosom.

Ancient Antipathy to Tobacco—April 18, 1621.—Sir William Stroud moved that he would have tobacco banished wholly out of the kingdom, and that it may not be brought in from any part nor used amongst us; and Sir Grey Palmes said that if tobacco be not banished it will overthrow 100,000 men in England; for now it is so common that he hath seen ploughmen take it as they are at plough.

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Passing Events.

Probably the most important local event to record this week is the action taken with regard to enforcing the injunction on the hydraulic mines. The way this was done, was to order the Sheriff to cut off the water from the mines. The different companies where the Sheriff called and shut off the water, have brought suit and asked an injunction to prevent the action. The details we give in another column.

The committee of the Board of Trade of San Francisco, which visited the region affected by the debris, have made a full and complete report, which we give in another column. The report advises the building of dams to control the debris.

A notable event this week worthy of record is the gift of Charles Crocker, the railroad magnate, to the California Academy of Sciences. He gives $20,000 to the Academy to promote scientific research, the money to be spent in any branch to be selected by the Academy.

Several whaling vessels have come from the north and brought news of the relief ship *Rodgers*, but none of the *Jeanette*. The *Rodgers* has determined that Wrangell Land is only a small island.

As to mining news we give all that is of interest in other columns. From the northern regions we hear of work being stopped and roads blocked by the snow. The prospectors have all come in from the hills and are most of them in winter quarters.

No coal was ever found in San Diego county, though indications are that it will be some day, when thoroughly searched for.

Alaskan Mines.

We had a conversation the other day with Col. A. F. Williams, of Oakland, who has recently returned from a prospecting voyage in northern Alaska. From him we learn some interesting facts concerning the mining resources of the region. Col. Williams left here with a party, on a schooner, in May last. They went up through the Aleutian islands and through the Behring sea into Norton sound; but most of the time was spent in Golowin bay, on the north coast of Norton sound. Here are high rocky mountains, steep and abrupt, though there are large prairies next to the coast.

Col. Williams went with a whale boat 100 miles up the Fish river and sent a party overland. A land party also traversed the region, and quite an extent of country was located.

The principal location made was a galena lead or deposit. We have seen assay certificates by Prof. Price, giving the value at 83% and 85% lead and $121 and $161 silver. This is almost pure galena, that containing 86% lead.

Col. Williams says the Esquimaux utilize this by putting a piece in the bullet mold and running lead around it, to make bullets.

The country all about the region visited by Col. Williams and party is a very difficult one to prospect in, but this is not on account of the heavy timber, as most people suppose. This heavy timber is more prevalent in the southern part of the Territory. But there is a heavy coat of moss covering the whole face of the country, making it very hard to get about. In fact, it is a most villainous country to get about in. The moss is from one to two ft. thick, and the ground is more or less boggy, so that if one steps off the moss bed, he is apt to get into the bog. Ten or twelve miles is a good day's travel, so it is very hard to prospect.

There are belts of timber here and there, but the mountains are generally barren and free from brush and trees. Yet there is timber here and there, and plenty for fuel or mining purposes.

The country rock is mainly a micaceous slate; but no gold was found. The mountains seem to be of a white spar, which some suppose to be lime. There are great dikes of granite extending for miles and miles. No sulphurets of iron were found anywhere. There is plenty of mica in great scales and sheets.

The schooner was taken into Golowin bay and there anchored. The prospecting expedition went out from this point. They were in 64.30° N. and 163° W. Overland, they were not more than 50 miles from Kotzebue sound, in the Arctic.

Col. Williams judges this to be a good mineral region. The Esquimaux talked a good deal of the lead mines they knew of elsewhere. He has no doubt there is a good deal of mineral thereabouts.

The expedition left here on the 5th of May last, and met the ice on June 1st. They coasted around Norton sound some 200 miles. There are a couple of thousand Esquimaux camping around the shores of the sound. The party found them very generally willing to do anything asked of them. These natives packed the ore down to the vessel from the mine, some 15 tons being taken out for shipment.

When they return in the spring, horses will be taken up and sleds will be used for hauling ore. There is plenty of feed and hay along the coast.

They have an average of good weather in the summer, about as they have it in New York. August is wet but not cold. The first frost came on September 15th. In June the sun was out of sight about 2½ hours; it was broad daylight and no stars to be seen for two months. There are five good working months for surface work, and when once underground deep enough, the men can work all winter. There is timber within half a mile of the mine, so there is no difficulty in building houses to make the men comfortable. Col. Williams says the ore can be put down here in San Francisco at a cost not to exceed $50 per ton. It is unnecessary to reduce it at the mine, as there is over 1,600 lbs. of lead to the ton of ore.

Col. Williams had met some men who had come from 1,500 miles up the Yukon river. Up there they had been making from $10 to $15 per day to the hand in placer mines. They can only work about four months in the year. A little stern-wheel trading steamer now runs up the Yukon, to about 1,800 miles from the mouth. She only makes two trips a year. Her timber was got out here, and she was put together at St. Michaels.

There are only four white women in the Territory north of Kodiak. One lady is at St. Michaels, and she told Col. Williams that it was no colder there than at her native place, Portland, Maine. There is also a Chicago lady four miles from St. Michaels. There is one at Ounalaska, the port of entry, 2,100 miles from here, and one on the Island of St. Paul.

Col. Williams says there is an abundance of plumbago all through that country. His party is the first that ever visited that region. At the mine they sunk 20 ft., but did not get through the frost—the frozen ground. The heavy coat of moss seems to protect the ice, as ice is protected in sawdust and blankets. The tops of the mountains are free from the moss. The mosquitoes are innumerable and very annoying, fiercely contesting their rights to the country. They seem to breed in the ice.

When the party started away, they stopped with their vessel to get water, and while at anchor a severe gale drove the vessel ashore and wrecked her, she being a total loss. The Esquimaux took the party to St. Michaels in skin canoes, where some of them joined the revenue cutter *Corwin*, and were brought to this port.

New Processes.

Paragraphs about the new Hamilton process, now being tested in New York, are going the rounds of the press in every direction, and we scarcely pick up a paper but some reference to it is seen. We have before mentioned that the principle upon which these processes is based is no new thing, but is one that has been tried in a dozen different ways, none of which have been successful. Amalgamation by means of melted lead was known and practiced before the value of quicksilver in this respect was recognized. But in those days it was not necessary to figure things down to such fine points in working ore as it is now.

Not only has the principle of working ore in lead baths been known for a century or so, but in late years, quite recently in fact, the process has been revived and tried with improved appliances, but it has not been successful from an economical point of view. When, therefore, we are told that the method of applying the principle invented by Mr. Hamilton is to work ore for us for $1 per ton, we are doubtful; and when we are told in addition that a prominent Comstock operator has offered a million dollars for the right of one county alone in Nevada, the offer being promptly and absolutely rejected, we simply don't believe it. And when, moreover, they tell us that "500 orders have been received for this machine subject to the success of the present work when completed," we begin to think that perhaps the Hamilton process people may have some stock to sell or something of the kind. We do not know that they have, but should imagine so. We know to our cost out here, what absurd things people used to believe about new processes, and how easy it is to get people into them one way or another; and the processes generally get into the people pretty easy, too.

Now, when the Hamilton process accomplishes some good work on a large scale, say, in treating a thousand tons or so of ore, and receives the endorsement of competent metallurgists after careful examination, it will be time enough to believe we are to have ore worked for $1 a ton. But, until then, such assertions as we have referred to, serve to create a feeling that the whole thing is a humbug. Not that ore cannot be worked in that way, for we know it can; but that it can work ore for any such figures as stated. So far as we have noticed, no mining engineer or metallurgist of prominence has examined the process and given it as his opinion that ores can be worked by it for $1 per ton.

Thanksgiving Day.

Proclamation.

It has long been a pious custom of our people with the closing of the year to look back upon the blessings brought to them in the changing course of the seasons, and to return solemn thanks to the All-Giving Source from whom they flow; and although at this period, when the falling leaf admonishes us that the time of our solemn duty is at hand, our nation still lies in the shadow of a great bereavement, and the mourning which has filled our hearts finds sorrowful expression toward the God before whom we but lately bowed in grief and supplication; yet the countless benefits which have been showered upon us during the past 12 months call for our fervent gratitude, and make it fitting that we should rejoice with thankfulness that the Lord, in His infinite mercy, has most signally favored our country and its people. Peace without and prosperity within have been vouchsafed to us; no pestilence has visited our shores. The abundant privileges of freedom which our fathers left us, in their wisdom, are still our increasing heritage, and if, in parts of our vast domain, some affliction has visited our brethren in their forest homes, yet even this calamity has been tempered and in a manner sanctified by the generous compassion for the sufferers which has been called forth throughout our land. For all these things it is meet that the voice of the nation should go up to God in devout homage. Wherefore, I, Chester A. Arthur, President of the United States, do recommend that all people observe Thursday, the 24th day of November, as a day of national thanksgiving and prayer, by ceasing, so far as may be, from their secular labors, and meeting in their several places of worship, there to join in ascribing honor and praise to Almighty God, whose goodness has been so manifested in our history and in our lives, and offering earnest prayers that His bounties may continue to us and to our children.

In witness whereof, etc.

CHESTER A. ARTHUR.

By the President:
JAS. G. BLAINE, Secretary of State.

DURING the working of the gravel mines of Minnesota district, Sierra county, Cal., it was nothing unusual to find small bowlders of quartz containing from $1,000 to $5,000.

The Debris Controversy.

The miners or mining companies that lately recommenced work on their claims in defiance of the injunction placed upon them by Judge Keyser, have been proceeded upon for contempt of court. Judge Mayhew sitting in Keyser's Court at Marysville, issued orders to the Sheriff of Nevada county, directing him to shut off the water in all hydraulic mines already enjoined, and to post notices of injunctions on the Eureka Lake Co's. mines.

The Sheriff of Nevada county has complained serving the papers issued by Judge Mayhew in the case of Marysville against the enjoined hydraulic mines of the Yuba and tributaries. At the Milton mine, French Corral, he found no water running. At the Manzanita, owned by the same corporation, he shut the water off, and the Eureka mine's water was stopped. Mr. Searles returned from there, the others going to Moore's Flat and stopping the water of the Boston and China mines. The North Bloomfield was served on the return trip, and the Sheriff and his companions were treated with courtesy. No work was going on, the water, where it was found running, being perfectly clear. In each instance the Sheriff was warned by the representatives of the owners not to interfere with the property. He did not put in keepers. The miners will lose no time in endeavoring to obtain the right to resume operations. They are much exercised at their condition of enforced idleness.

Confidence is expressed that the mines will be in full blast again in a few days, with the sanction of the law. The Sheriff's bondsmen became a little alarmed, for the reason, it is generally believed, that the shutting off of the water will be declared an illegal act. Upon assurance from representatives of the mine owners that he would not be held responsible for the damage done they concluded to not withdraw.

In an interview, Hamilton Smith, Jr., Superintendent of the North Bloomfield mine, said: "The legal advisors of the miners in this city think that the order is illegal," was the answer. "You recollect that the Supreme Court, on an exparte hearing, decided that Judge Keyser was disqualified from trying the case of the city of Marysville against the Nevada county gravel mines. Judge Keyser then asked Judge Mayhew to bear the case, but instead of hearing the case as presented to Judge Keyser, he took the case up where Judge Keyser had stopped, and accepted all that had gone before to be legal. He then proceeded to order the enforcement of the Keyser injunction, not after hearing evidence in the case, but upon the plaintiff's affidavits that the miners had failed to obey the Keyser injunction. So, in effect, it is the Keyser injunction the Nevada county Sheriff is ordered to enforce, and not an injunction issued by Judge Mayhew."

Judge Dibble says: "That is a manner of serving an order or injunction heretofore unknown, or, at all events, undiscovered by the courts of this State."

As will be seen by what is given elsewhere, the miners have brought suit against the Sheriff for turning off the water.

The Miners Ask an Injunction.

On Wednesday the North Bloomfield, Eureka Lake and Yuba Canal, Meteor, Yuba Tunnel and China hydraulic mining companies began suit in the Superior Court of Nevada county to recover damages from Sheriff Tompkins for his having shut off the water in their mines by order of the Yuba County Superior Court, and to obtain an injunction against his further interference in the premises. The plaintiffs furnished $1,000 bonds in each case. Judge Caldwell issued the injunction, and it was served by the County Coroner. Report says that the mines will at once resume operations. The papers filed by the Eureka Lake Co. are fair samples of the others. After describing its status and property, this plaintiff avers that defendant, with force, shut off the water on the 8th inst., wrongfully damaging it in the sum of $500; that said ditches have a capacity of not less than 3,000 inches, miner's measurement, worth 15 cents per inch for 24 hours. The value of the mines is not less than $200,000; revenue yielded not less than $1,000 a day, and aggregate value of mines and ditches not less than $400,000. As a result of the water being continuously shut off, it is alleged that plaintiff will be deprived of the use of its water, the water entirely lost, the property depreciated in value and the revenues lost and destroyed, causing irreparable injury of a nature not susceptible of accurate estimate. It is further averred that the court calendar will not permit of the case being tried in several months, and that defendant is not pecuniarily able to respond in damages, wherefore plaintiff asks for a temporary injunction to restrain defendant, or his agents, from shutting off or interfering with the water, or preventing it from running down to the mining claims, or in any way trespassing or interfering with the working of said claims until a hearing upon its merit can be had, and that at a final hearing said writ be made perpetual.

THE *Times-Review* of Tuscarora district has ceased publication as a daily for the present, Tuscarora having gone down so much in the past few months, and there being no chance of its coming up until next spring.

The Debris Committee.

Tha committee to whom the important duty of visiting and inspecting the districts affected by the great debris question and of making a report thereon, with such suggestions as to a possible remedy or a compromise among the parties in interest, completed their labors and submitted their report, a copy of which is as follows:

The committee appointed by the citizens of San Francisco to investigate the subject of the injury done to agricultural lands by the debris from hydraulic mining, beg leave to report: That their investigation was made at the request of the Anti-Debris Association of the Sacramento valley. Their attention was called by that association specially to the condition of things existing on the Yuba, Bear and Feather rivers and the adjacent country, and their examination, therefore, has been confined entirely to that section of the State. They began their work at Marysville. There they inspected the Yuba and Feather rivers and the extensive levees intended for the protection of the city from the inundation of those rivers. Its condition is critical in the extreme. The bed of Yuba river along the front of the city has been filled up with mining debris to such depth that it is now above the general level of its streets. Formerly there was sufficient depth of water along its front to float steamers of considerable draft. The whole river to the opposite bank has been filled with white sand, and the only protection the city now has from annual inundation is by levees about 15 ft. in hight, constructed and maintained at an average annual rate of taxation for the last 10 years of five per cent. If the debris be allowed to flow into the river as in the past, it is certain that these levees will cease to afford further protection, and the ruin of the city will be inevitable. At no point of their examination did the committee witness a more striking illustration of the danger of an unchecked flow of the debris into the river channels. This debris consists of fine muddy particles held in suspension, which is known as "slickens," and coarse sand and gravel which rolls along the bottom of the rivers.

West Bank of Feather River.

The adjacent country along the west bank of the Feather river, in Sutter county, was next examined as far down as the town of Nicolaus. Along this line of 17 miles, levees of immense dimensions have been constructed, some of which have a width of 100 ft. at the base and 20 ft. at the top, and 15 ft. in hight, for the purpose of protecting that part of the country from inundation of the Feather river. The country in Sutter county lying to the west of the levee referred to, is a rich alluvial plain, much of which is under cultivation and covered with fine residences, barns and other improvements. Over this extended plain, on every hand, were the evidences of recent inundation of considerable depth. The committee was informed that this overflow was caused by the breaks in the Feather river levees during the winter floods of 1880–81.

East Bank of the Feather.

They next examined the east side of the Feather river in Yuba county, as far down as Bear river, and also the adjacent country. The evidences of inundation were on every side, and to a depth even greater than on the west side of the Feather river. At a point on the main road from Marysville to the Bear river bridge, the water marks on a barn standing on what is there termed high land, showed a depth of about five ft. of water during the winter of 1880–81. Along the lowlands on this bank of the Feather there was a deposit of white sand many feet in depth, totally destroying them. This was specially the case with a large part of the Miller ranch and the Mesick ranch, which, but a few years since, were under full cultivation in alfalfa, orchards and grain. These fine lands are now but sandy wastes. In much the same condition were the Lozier and the Plumas ranches. The houses on these latter ranches, although standing on high ground and at some distance from the river, showed evidence of an inundation last winter of from 5 to 10 ft. The whole condition of the country on this bank of the Feather river below the junction of the Yuba, was that of desolation.

South Side of Bear River.

The committee then crossed Bear river about a mile above its junction with Feather river, and followed up the southern side to within one mile of the town of Wheatland, at which point it is crossed by the California & Oregon railroad. Here again was seen even more deplorable evidences, not only of inundation, but of total destruction of lowlands by heavy deposits of white sand and debris. No language can convey an adequate idea of the scene presented at the Keyes and Brewer ranches. They were represented to have been among the finest lands of the State, under full cultivation, a few years since, and now they are sandy deserts. The residences have been raised from time to time some 10 ft. above their original base, to avoid the debris avalanche, but finally they have been entirely abandoned, as too unsafe for human habitation. At the railroad bridge across Bear river, near Wheatland, the story is repeated. The flood caused by the filling of the river bed has compelled the raising of the track not less than three times, amounting in the aggregate to 18 ft.

Vicinity of Oroville.

The committee next visited the Feather river at Oroville, and found a portion of its site subject to overflow chiefly from the discharge of debris from the hydraulic mines in the immediate vicinity. Here cause and effect were brought into close relation, and this point was examined rather as illustrating the general problem than as entering into that under their present consideration.

North Side of the Yuba.

The next line examined was the north side of the Yuba river, from Marysville to the point where the foothills begin, and where the Drainage Commissioners proposed to erect a retaining dam, but afterward the plan of the brush dam, some miles below, was substituted. From Marysville to this point the Yuba river has been leveed almost the whole distance at great cost, and numerous ranches along this bank have been totally buried in sand, among them the famous orchards of Briggs and Teegarden. Instead of a narrow and deep channel with bluff banks, as in former days, the river bed now is a wide, shallow sand plain, varying in width, from Marysville to this point, from one to two miles, entirely covered in the flood season by a swift current laden with further supplies of debris to be deposited at lower points of its own stream and in the Feather river, and on such lands as are low enough to receive them.

The Debris Deposit.

We learn from State Engineer Hall that the Feather river, at its junction with the Yuba, opposite the city of Marysville, has been filled from bank to bank, from 20 to 30 ft.; from 40 to 50 ft. at the site of the dam, eight miles above; from 100 to 120 ft. at Smartsville dumps, 13 miles above; and from 30 to 40 ft. at the forks of the river 8½ miles farther up; between these extreme points, he states that 100,000,000 cubic yards of heavy debris now rest above Marysville. It appears from the same authority that the aggregate amount of agricultural lands destroyed by debris in this section up to the year 1880, was 43,546 acres, to which may be added the damage caused during the winter of 1880–81.

The Brush Dam.

In their route up the Yuba, the committee examined the brush dam, which although built upon correct engineering plans was constructed in too great haste on account of the near approach of the rainy season, and was not completed in accordance with the plans, the northern 400 ft. being constructed of earth which was first, to give way when the storms began. The dam was about 10,000 ft. in length, of which about 1,400 ft. was washed out by the floods, the remaining portion withstood the storms and retained a large amount of debris. The committee are of the opinion that the repair of this dam is necessary for the safety of the country below it, and the cost is estimated by competent engineers at from $25,000 to $30,000.

Responsibility of the Hydraulic Mines.

The committee next entered on the examination of the cause of all the deplorable results they had witnessed on the plains below, the special point being the responsibility of the hydraulic mines therefor, and for that purpose examined the Yuba river, between Smartsville and North Bloomfield, and the principal mines which discharge their debris into it. These are characteristic of all the rest as to mode of work and discharge of debris.

The present system of hydraulic mining dates from the invention, in 1870, of the "Chief," a cannon-shaped machine, which rests on the ground and receives the terminal end of the pipe through which flows, within any given time, 50% more water than that furnished for the entire supply of the city of San Francisco. By aid of friction rollers, it can readily be turned in any direction and can be managed by a boy; it projects an 8 or 9-inch stream of water a distance of 300 to 400 ft., and with such enormous power as to readily move rocks weighing several tons. The machines are called Monitors and Little Giants, and several are used at times in a single mine, and in addition to running all day, are operated at night by aid of the electric light.

Extent of the Mining Industry.

The auriferous deposits, from 100 to 300 ft. in depth, are washed down to the bedrock, and the whole mass of slum, sand and smaller rock is discharged through sluices in greater or less quantity, directly or indirectly, into the channel of the Yuba river. The reservoirs from which this water is drawn are situated at the foot of the Sierra, and the ditches conducting it to the mines are in some instances 40 to 70 miles in length. Channels for the discharge of the debris have been excavated for miles in length through the bedrock. These works have cost very large sums of money, amounting to millions of dollars. The officers of the North Bloomfield, Milton, Eureka, Lake, American, Excelsior and South Yuba companies informed the committee that about $12,000,000 has been expended by them alone. The total capital invested in hydraulic mines is estimated to be $80,000,000, and it is represented that the amount of gold produced annually from the mines in this State is about one-eighth of the present aggregate product of the world.

Thrift in the Mining Regions.

The committee passed through many mining villages and towns, all showing evidences of thrift and prosperity. Comfortable schoolhouses were seen in every village, and the orchards and gardens surrounding the houses of the miners betokened a degree of comfort unusual for any laboring class. It was apparent that a considerable population, directly and indirectly, derives its support from the working of these mines; and their stoppage, even temporarily, would entail much hardship.

Where the Debris Comes From.

A careful examination of the hydraulic mines on this ridge satisfied the committee that the filling in of the Yuba river and the consequent inundation of the adjacent lands, is wholly due to the debris discharged by those mines into its upper channels; yet they saw enough to satisfy them that the hydraulic mines now being operated, are not entirely responsible for the damage done to the agricultural lands. Large quantities of debris were seen stored in the ravines at various places where no mining work has been done for many years past, and are swept down more or less by the heavy mountain rains of each year, helping to swell the sand tide upon the plains below.

Practicability of Dams.

The committee carefully examined a point on the Yuba river below the junction of all its forks and Dear creek, where, it was represented to them, a series of rock dams might be constructed, which would impound the debris of the hydraulic mines situated on those forks for many years to come. The problem is an engineering one, and they have the authority of Col. Mendell, of the United States Engineer Corps, and of Mr. Hall, the State Engineer, in saying that such dams are practicable, and will retain a very large proportion of the debris of those mines, and improve the condition of the river below.

In the report of Col. Mendell to the Engineer Department, under date of Feb. 20, 1880, he estimated the cost of a sufficient number of dams to impound 35,000,000 cubic yards of debris to be $222,025.

In the report of Engineer Hall, made in 1880, it is estimated that "there are 22 326,500 cubic yards of material washed annually into the canyons of the Yuba and its tributaries by the hydraulic mines; about 10% of this, or 2,332,650 cubic yards are believed to rest in the canyons above, by reason of the material being exceedingly large and heavy rocks; about 30% or 6,697,950 cubic yards are believed to be of such fine material that it will be carried out in suspension, and not be stopped by action of the dam, thus leaving 60% of the whole, or 13,395,900 cubic yards annually, of a character (sand and gravel) which will be deposited in the reservoir."

The Tule Lands as a Receptacle.

The committee are aware that it has been suggested that the tule lands south of Bear river and west of Feather river can be used as receptacles for the debris of the Bear and Yuba rivers. This would most probably help the Sacramento river, but falls short of solving the question in hand, for the safety of Marysville and the adjacent country requires that the mining debris be retained by proper dams as near the location of the hydraulic mines as practicable, so that the danger be met nearer its source.

The thousands of people engaged in agricultural pursuits and business occupations, whose property is in jeopardy, are demanding, in no uncertain tone, security against further damage. The construction and maintenance of their levees, unsafe barriers at best, would ere this have exhausted their means, but for the extreme fertility of their lands. They can stand but little more, and they must have relief or abandon their homes.

Mining and Agriculture.

Mining and agriculture are the two main arteries of our body politic, and neither can cease to pulsate without impairing its vitality. The whole State is to some extent a party to this contest. It cannot see without apprehension thousands of its citizens arrayed in two parties, each believing that the claims asserted by the other are wholly destructive of their respective rights and interests. Every effort must be made to end this dispute, and the committee appeals to good citizens of either side, to divest themselves of all extreme views and lend their influence to a fair settlement of this vexed and dangerous question. What is necessary, then, is for duly accredited representatives of the mining and agricultural interests to come together in a spirit of conciliation, and with a desire to adopt some plan by which a safe and speedy conclusion may be reached to protect the property and pursuits of both parties for all time to come. The committee recommends that security against further damage, and that speedily, must be given by the miner and accepted by the farmer, as the condition of his withdrawing further opposition to work on the mines.

How that security is to be guaranteed, whether by a stoppage of their work, and for what period such stoppage is to continue, are questions which can be adjusted only by a free conference such as alluded to. The committee sincerely trust that by such means a result satisfactory to both parties may be reached.

Magnitude of the Questions at Issue.

The committee would respectfully and earnestly represent that they have been deeply impressed with the magnitude and importance of the questions at issue, and the diversity of interests and the imperative necessity of an immediate concert of intelligent and scientific action of the parties in interest. The well-being and prosperity not only of the parties more directly interested, but of the State itself, require their speedy solution on some basis which will allow the prosecution, without conflict, of the mining and agricultural interests.

General Conclusions.

The committee therefore having that in view, would respectfully report as their conclusions:

First—That all property and property rights ought to be respected and protected.

Second—That the true interests of the State require the promotion of both the agricultural and mining interests.

Third—That the discharge of debris from the hydraulic and other mines into the river channels has been very destructive in its effect upon the agricultural lands and to the rivers and streams, and, if continued as at present conducted and operated, will be disastrous to the agricultural lands, and like a lava stream will blast and render sterile and barren that entire section of the country, blotting out its towns and cities, and rendering it a perfect "Sahara."

Fourth—That the hydraulic mining interests in which so much capital is invested, and which supports a very large, thrifty and intelligent class of our citizens, are of great importance and magnitude, and its encouragement is not alone desirable, but a duty, for its wants would tend to benefit and develop the very land which it will now destroy for want of concerted, scientific and judicious action being taken in the impounding of its debris.

Fifth—That dams be immediately constructed on the Yuba river, below the junction of Dear creek and at Degare Point; also, that the break in the brush dam on the Yuba river be at once repaired.

Sixth—That the entire cost of the construction, maintenance and repair of proper dams for the retention and storage of debris, should be borne by the mining interest.

Seventh—That the Federal Government should be urged to appropriate sufficient means to dredge and otherwise improve the navigation of the Sacramento and Feather rivers in the interest of commerce.

Eighth—That all litigation be suspended between the parties interested, as a further prosecution of vexatious and expensive proceedings cannot afford a remedy; but rather tend to exhaust the means and antagonize those whose best interests should cause them to co-operate intelligently and dispassionately, to obtain a remedy to protect the interests involved.

Ninth—That security against further damage is imperative, but whether that shall involve the stoppage of the mines during the construction of the dams is not our province, but that of the convention to decide.

Tenth—That in order to bring about a co-operation of the heretofore conflicting interests; to secure a fair, honorable and equitable adjustment of this matter; to adopt and carry out a speedy plan and remedy; to enlist the sympathy and support of the people of the State and its representatives, a convention be called in San Francisco, to convene on Thursday, the 17th day of November, 1881.

A Joint Conference Proposed.

That the Anti-Debris Association of Sacramento valley and the Mines Association each appoint 15 delegates to form said convention, duly authorized to act on this and all other subjects connected with their interests on the debris question, and if in their judgment they deem it advisable, select ten disinterested citizens of San Francisco, Oakland, or vicinity, as members thereof.

This convention will afford the farming and mining interests an opportunity to meet together and agree upon the details of a plan upon the basis proposed by the committee. If these interests desire a speedy and amicable adjustment of this question, they can by mutual concessions settle their differences in a prompt and efficient manner.

These views, the committee are aware, can have no further force than as the result of an impartial examination, and they are impressed with a belief that a contest in Court will be tedious, expensive, and fail to settle the question in time to give relief. In years later, if that course is relied upon, the parties interested will, on taking a retrospective view of the situation, and considering the amount expended with the damage which could have been prevented, conclude that the suggestion of the committee offered at this time would have been less expensive and more satisfactory in its results.

In conclusion, the committee desire to state that many facts connected with this subject and submitted, have not been referred to, it being the principal aim and desire of the committee to conduct the examination and to report thereon, with the view of harmonizing, as far as practicable, the feeling naturally engendered on both sides, and endeavor to bring about a concert of action for mutual protection in the future. The committee were impressed with the opinion that an intelligent consideration of this subject by representatives of the parties interested, who possess an intimate knowledge of the evils and the imperative necessity for a remedy, would tend to a practical, peaceful and beneficial solution, alike creditable to them and to the people whom they will represent.

WALTER N. HAWLEY, Chairman,
JAMES E. GORDON, Secretary,
WILLIAM BLANDING,
JULES CERF,
P. B. CORNWALL,
MOSES HELLER,
JAMES B. STETSON,
C. L. TAYLOR.

Having been with the committee during their investigation, I concur in their report and conclusions. W. S. ROSECRANS.

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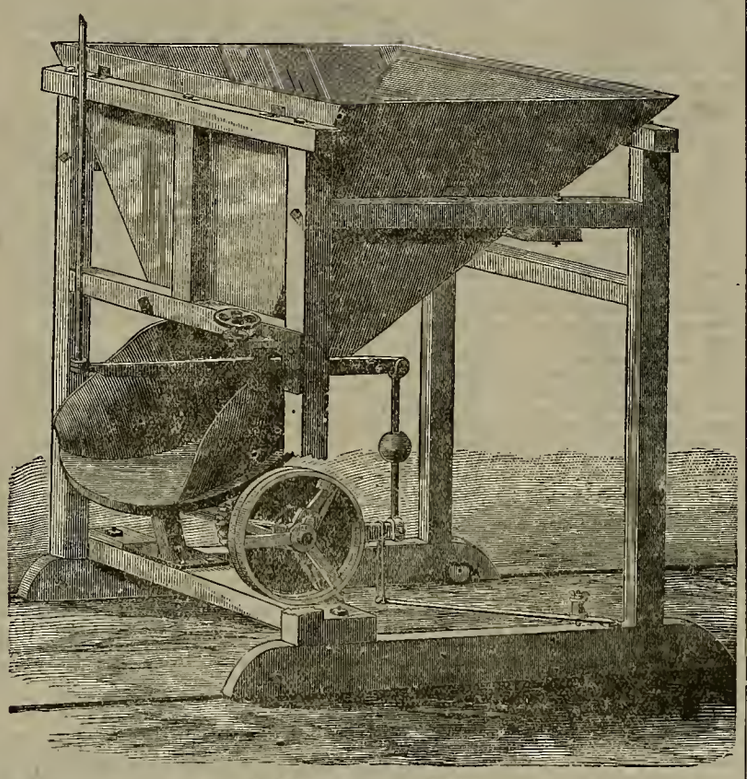

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Mahoney	40	"	Amador	"	"
Zeile	40	"	"	"	"
Placerville	40	"	El Dorado	"	"
Gross	80	"	"	"	"
Julian	20	"	Placer	"	"
St. Patrick	15	"	"	"	"
Providence	20	"	Nevada	"	"
Omaha	10	"	"	"	"
Green Mountain	60	"	Plumas	"	"
Plumas-Eureka	60	"	"		
Bulwer-Standard	30	"	Bodie Dis., Mono,		
Standard	20	"	"	"	"
Noonday	30	"	"	"	"
Bodie	10	"	"	"	"
Christy	5	"	Uintah Co., Utah.		
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Contention	20	"	TombstoneDis, Arizona		
Grand Central	20	"	"	"	
Harshaw	20	"	Patagonia,	"	
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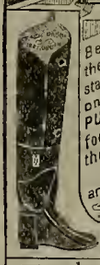

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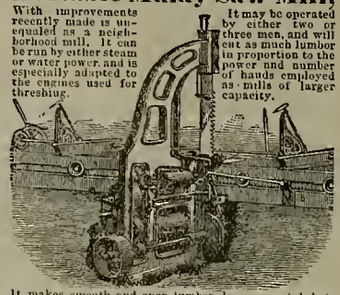

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
☞ Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.
JOHN TAYLOR & CO.

ALEX. DEL MAR,
Mining Engineer,
Late Director of the United States Bureau of Statistics Mining Commissioner for the United States Monetary Commission, etc., No. 216 Sansome St., San Francisco. Cable address—"Del Mar, San Francisco." Branch Office, 61 Broadway, New York. Cable address—"Del Mar, New York." London Agency: H. Stodes & Co, 24 A, Southwark St., S. E. Cable address—"Del Mar, London." Paris Agency: J. H. McDonald & Co., 13 Rue St. Lazare. Cable address—"Del Mar, Paris."

G. KUSTEL. H. KUSTEL.
METALLURGICAL WORKS,
318 Pine St., (Basement),
Corner of Leidesdorff Street, - SAN FRANCISCO

Ores Sampled and Assayed, and Tests Made by any Process.
Assaying and Analysis of Ores, Minerals and Waters.
Mines examined and reported on.
Practical Instruction given in Treating Ores by approved processes.
G. KUSTEL & CO.,
Mining Engineers and Metallurgists

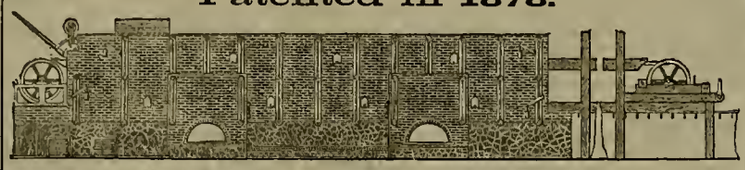
OTTOKAR HOFMANN,
(Of the Firm of Hofmann Bros.)
Metallurgist and Mining Engineer.
Erection of Leaching and Chlorination Works a speciality
Working Tests and Reports made.
415 MISSION STREET, SAN FRANCISCO.

H. DEGROOT, SR. F. E. BIGE. H. DEGROOT, JR.
DeGROOT, BIGRE & CO.,
Mining Engineers & Assayers,
Examination of and Reports on Mines a Specialty.
No. 331 Montgomery Street, Room 28.
SAN FRANCISCO.

NOTICE.
The office of the STETEFELDT FURNACE CO., having been removed to New York, parties wishing to obtain information in San Francisco about the Stetefeldt Furnace will apply to Messrs. Prescott, Soott & Co., Union Iron Works, San Francisco. C. A. STETEFELDT.

SHEET IRON PIPE.
FRANCIS SMITH & CO.,
Manufacturers of
THE PATENT CHANNEL IRON WHEELBARROWS.
THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand
SHEET IRON PIPE.
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Arteeian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.
Office and Manufactory, 130 Beale Street, San Francisco.
SHEET IRON PIPE.

THE O'HARRA
CHLORIDIZING FURNACE.
Patented in 1878.



SIDE ELEVATION OF THE O'HARRA FURNACE.

This Furnace is Constructed with two SEPARATE HEARTHS, one for DESULPHURIZING and one for CHLORIDIZING the Ore.
BOTH PROCESSES ARE PERFORMED AT ONE OPERATION.

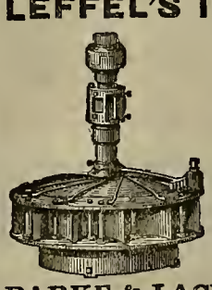
An endless chain carrying conveyors or scrapers passes continuously through over both hearths, going one way through one chamber and the other through the other chamber. By this means the ore is fed and discharged at the same end of the furnace.
A cheap Furnace to build and to run.
The process is essentially the same as the well-known Freiberg process; but the mechanical devices applied to the furnace and the peculiarity of its construction enable the inventor to thoroughly desulphurize and chloridize the ore to a higher percentage than other furnaces, and with less cost for fuel and labor.
At Washoe and Ophir Tailings Mill it costs $1.10 per ton to work 40 tons in 24 hours.
At the Exchequer Mill, Alpine County, 20 tons are worked in 24 hours, at a cost of $2.61¼.
Lewis Chalmers, of the Isabella O. & S. M. Co., Silver Mountain, Alpine Co., says: The O'Harra Furnace did all that is represented in the MINING AND SCIENTIFIC PRESS, roasting and chloridizing at the figures there given, antimonial and arsenical sulphurate of silver up to from 84% to 95% of the assay.

SEND FOR DESCRIPTIVE CIRCULAR TO
WHITNEY, YEASEY & CO.,
Carson City, Nevada.
Agents for San Francisco, KUSTEL & CO., 318 Pine Street.

MOREY & SPERRY,
MANUFACTURERS OF
Gold and Silver Grinding and Amalgamating Machinery

HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.
IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill. It requires twelve-horse power.
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies. Iron Work complete for Wood Frames, also
SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.
☞ Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
MOREY & SPERRY—Warerooms, 92 and 94 Liberty St., N. Y.

LEFFEL'S IMPROVED WATER WHEEL.



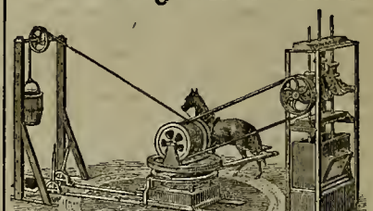
PRICES REDUCED!
PATENTS REISSUED 1868.
The "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.
Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
JAMES LEFFEL & CO., Springfield, Ohio,
and 110 Liberty St., N. Y. City.
PARKE & LACY, Sole Agents, 21 and 23 Fremont St., S. F.

STEEL CASTINGS
FROM 1-4 TO 10,000 lbs. WEIGHT.
True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
CRANK SHAFTS, SHOES, DIES and GEARING specialties.
Circulars and Price Lists free. Address
CHESTER STEEL CASTING CO.,
Works, CHESTER, Pa. 407 Library St., PHILADELPHIA

SELBY SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.
Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

Mines and Mining Properties Solicited for Sale.
I have unexampled facilities for rapidly placing Mines and Mining Properties, and claims of
Ascertained Value
Upon the Market, through my Branch Offices in
NEW YORK, BOSTON, PHILADELPHIA, CHICAGO, ST. LOUIS, LONDON, ENGLAND.
OWNERS OF
Meritorious Mines and Prospectors
WHO HAVE NOT THE MEANS TO PROPERLY DEVELOP THE SAME MAY FIND A PURCHASER THROUGH MY OFFICE.
If You Have a GOOD MINE, or a GOOD PROSPECT for sale, apply to me in person or by letter.
JAMES. A. MARS,
45 to 49 Merchants' Exchange, California St
SAN FRANCISCO, CAL.
REFERENCES:
London and San Francisco Bank, S. F., Cal.
Anglo-Californian Bank, S. F., Cal.
John J. Valentine, Superintendent Wells, Fargo & Co.'s Express, S. F., Cal.
J. B. Haggin, Capitalist, S. F., Cal.
Louis A. Garnett, Capitalist, S. F., Cal.
Daniel Meyer, Capitalist, S. F.
Prof. Thos. Price, M. E., S. F., Cal.

New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
Agent and Manufacturer of Mining Machinery
38 and 40 Main St., S. F.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING NOVEMBER 1, 1881.

248,835.—SEAL PADLOCK—A. M. Adams, S. F.
248,906.—HORSE-POWER—C H. Laker, S. F.
248,909.—FENCE BARE—W. W. Butler, Boise City, I. T.
248,911.—METALLIC LATH—P. Caduc, S. F.
249,062.—SHIRT—L. Lemos, S. F.
248,938.—HYDRAULIC DERRICK—O. M. Loveridge, Weaverville, Cal.
248,890.—TYPE WRITER—A. G. Sbannon, Santa Rosa, Cal.
248,068.—STAMP MILL.—J. M. McFarland, Virginia City, Nev.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

METALLIC LATH.—Philip Caduc, S. F. Dated Nov. 1, 1881. No.248,911. This invention relates to improvements in that class of laths known as metallic laths, and which are intended to take the place of wooden lathing. The improvements consist in a peculiar formation and construction of the lath, by which the inventor is enabled to produce a more complete and firmer bond for the mortar, while the lath itself is made very firm and stiff, with no tendency to bend or lose its form from the weight of the mortar. This sheet metal lath has the edges turned inward to an acute angle, while the central portion is formed into a projecting double incline, said double inclined faces having perforations or slots made opposite to each other, so that the mortar shall pass through and lock.

HYDRAULIC DERRICK.—O. M. Loveridge, Weaverville, Trinity county, Cal. Dated Nov. 1, 1880. No. 248,938. This invention relates to a novel combination of a hydraulic water wheel, with certain intermediate glazing, so that the direct force of a stream of water may be brought to act upon the wheel, to drive the hoisting drum at a slow or fast speed. The apparatus is constructed by metallic levers, and from the position of the wheel is entirely protected from wet, while the derrick may be turned in any direction. By the peculiar construction the inventor provides a combination of a derrick and a force wheel, which is easily handled, and the wheel is entirely out of the way beneath the platform, so as not to throw water to splash the operator or machinery.

The Veterans' Home.

A commendable movement is now in progress to raise funds to establish a Veterans' Home, where the helpless survivors of the war may be housed and cared for during the remaining days of their pilgrimage. It is proposed to locate the Home upon a farm where it may be made self-sustaining after the land and buildings are paid for. The project will commend itself to patriotic men in all parts of the State, and we doubt not all who can contribute to the cause will be glad to do so. The following circular will explain the need for the Home and what is required to secure it:

The Executive Committee of the Veterans' Home Association beg to present the following:

1st. We have the names and postoffice addresses of about 7,000 veteran soldiers and sailors resident in California, who served under our country's flag in past wars; and we know there are many more on the Pacific coast

2d. One hundred of these are in public almshouses of California, and a much larger number, by reason of old age and infirmities, are being surely drawn to them.

3d. Patriotism, humanity, and even public interest demand that these suffering relics of our country's defenders should be provided with a home where they may live in decency and respect, and, dying, escape burial in paupers' graves.

4th. Many States of the Union have built such homes for their disabled soldiers and sailors, and our remoteness from the national center makes it necessary that there should be such a home on this coast. Our Veteran Home Association now appeals to the generous and patriotic people of California to furnish money to buy an ample tract of productive land, enough to establish it on a self-sustaining basis.

5th. Sixty thousand dollars will do to start it and give a home to the maimed and helpless, while those who cannot obtain employment or do full work, will there have shelter, food, books, newspapers and companionship, by the aid of their own labor, and such help as may be reasonably expected from the Federal and State Governments.

W. S. ROSECRANS,
Chairman of Executive Committee.
Headquarters, Nucleus Building, S. F.

NINETY cars of freight pass daily over the Southern Pacific eastward. To do this work between Los Angeles and Yuma, 24 large and powerful locomotives are employed. On the ascent towards Colton from Los Angeles two locomotives are employed to each train. From Colton to and beyond ths San Gorgonio summit an extra locomotive is required. These heavy trains are largely loaded with merchandise and Los Angeles produce.

THE Spanish government has decided to release all political prisoners.

Brief Mining Notes.

Two of the principal mines of Tuscarora have closed down, and others will follow. Not a stamp will be dropped in the camp before next spring.

IT appears that there is a continuous mineral belt running through Nevada, Cooper and Taylor districts, Nevada, a distance of fully 15 miles.

ATTENTION is being more freely given to gold quartz mining in California, now that the Comstock does not attract all the attention of mining men.

A CORRESPONDENT of the Eureka *Sentinel* says it requires two summers to get the machinery in for one 20-stamp mill into the Sawtooth region, Idaho.

THERE are numbers of quartz ledges in this State, which would pay handsome profits if capitalists would take hold of them and help the owners put them in shape for profitable work.

The Sawtooth range is believed to be the best part of the Wood River country. On the Sawtooth they have free milling ore and a good deal of it. But that part of the district is extremely rough in the winter.

SUPERINTENDENT GOULD is still bothered and perplexed by the sickness of the men at Mendha mine, Nevada. The mine is shallow and there are two shafts which afford good ventilation, and yet the miners give out. The most of them say they are leaded.

Two men, one day recently, took out $2,000 worth of ore from the Monitor mine, Taylor district, Nevada. This is a stand-off for that $1,000 worth of ore taken out of the Eureka tunnel one day, by one miner, that the *Sentinel* wanted to see matched elsewhere.

WELLS, FARGO & Co's. bullion shipments from Silver Reef, Utah, for the month of October aggregated $83,690.41. The outlook of the sandstone district was never brighter, and the yield for the ensuing season promises to be the largest since its discovery.

ABOUT 200,000 ounces fine silver was turned into the San Francisco Mint on the 4th, for account of the Government, at $1.13 per ounce, which was the price offered that day for lots over the counter. The above amount was awarded at Washington, the Nevada bank getting 110,000 ounces.

THE Boston mill company have bought the Stonewall mine, Tombstone, for $100,000. This purchase gives assurance that the Boston mill, that heretofore has had to depend entirely upon custom work, will hereafter be kept running at its full capacity and thus give an additional output of $100,000 or more per month.

PROSPECTORS have been showing specimens of rich gold rock which they claim to have found near Hailey, in the Wood River country. It probably came from California. The *Miner* says: This is a silver bearing region and though a sprinkling of gold is found in some localities, we have yet to learn of anything like a gold mine hereabouts.

THE Amador *Sentinel* asks the Sacramento *Bee* if it considers one of the miners' rights is "permission to come down from the mountains and work 17 hours a day in your 1,000 acre grain field, by the side of a Chinaman and for Chinese wages? That is one of the principal 'rights' enjoyed by the farm laborer of the Sacramento valley."

DON'T be fooled by the exhibition of a fine piece of rock nor take stock in any miner or prospector who offers to show you his claim, and promises to give you an extension for a certain amount of cash. He may be honest in his intentions; but if he is, he will take you to his claim without charge, save, perhaps, enough to defray actual expenses, and sell his property on its merits.

THE Tuscarora *Times-Review* says: From several years' experience in isolated mining districts as publisher and proprietor of newspapers, we have learned that in most prosperous times, during the winter season, the business is unprofitable, and further, that the irregularity of the mails, and the general inaction of our home people, creates such a dearth of news, that the labor of filling the columns of a daily is not only laborious, but, when performed, is very unsatisfactory.

PAN WORK.—The Ward *Reflex* says the Monitor mill is in good running order, and barring unforeseen accidents, will not shut down again until the water freezes up. It now puts through between seven and eight tons daily. It being a water mill and running under small expense, makes it a paying institution. The estimated cost of working the ores is between $5 and $6 per ton. Experiments have been going on for some time, and it having been ascertained that the ore can be worked up to as high a per cent. by running four hours in the pans as by six and eight hours, it has been decided to put in a 50 screen instead of the 60, and work 400 instead of 200 tons of ore a month. This will be done as soon as another pan can be put in, which will not be later than two weeks at the outside.

THE Boston *Post* says that the man who has been speculating in Confederate bonds, explains that he did so because he wanted to tackle something that was a little safer than the average mining stock.

News in Brief.

ANGLO-FRENCH intervention in Egyptian affairs is threatened.

GEN. SHERMAN advocates an increase in the army of about 20%.

A FAMINE is feared in northern Russia, owing to a failure of crops.

FIVE thousand lives were lost by the recent floods in Spanish Honduras.

BY a fearful typhoon in western Tonquin, China, 6,000 Christians are ruined.

A STATUE of Lord Byron has been unveiled at Missolonghi, Greece, where he died.

NEARLY all the mills on the Carson river are likely to be in operation this winter.

A DANISH naval officer is about to begin a search for the Arctic steamer, *Jeannette*.

THE Turkish government is preparing to chastise the rebellious tribes of southern Arabia.

PHILIP E. SULLIVAN, one of the Iron Mountain train robbers, has died in prison of homesickness.

ACORNS in Redding are selling for more per bushel than wheat in Modoc county. The former are worth 75 cents per bushel, while the latter only brings 50 cents.

ADVICES from Mecca, to the end of October, report that the number of cases of cholera averaged 15 daily. The number of pilgrims in that city was 100,000.

Removal of Dewey & Co.'s Patent Agency and Newspaper Offices.

October 29th the patent agency and newspaper offices of Dewey & Co., were removed to the northeast corner of Front and Market Sts., occupying a large space on the upper floor, where we have spacious and pleasant rooms for the accomodation of our increasing business. Our apartments will have two entrances as shown in the following engraving: Our stairway, No. 252 Market St., and our elevator, No. 12 Front St.

☞ Take the Elevator at No. 12 Front St.

Visitors will find it better to step around the corner from Market St., to the elevator rather than ascend the stairs. Old and new friends are cordially invited to give us an early call in our new quarters.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOOKSELLERS, STATIONERS, ETC.—Messrs. Payot, Upham & Co., No. 204 Sansome Street, are one of the oldest, most enterprising and reliable firms in the book and stationery trade in San Francisco. Scientific, industrial and foreign publications are a specialty with them. They are also noted for their first quality of blank book and fine stationery line of goods.

THE advertisement of F. Mansell & Co. in another column shows that they have moved to 434 Pine street, opposite their old stand. For ornamental, sign, and glass work, gold block letters, etc., this firm bears an excellent reputation in San Francisco, where it has been long established. We ourselves have patronized Mr. Mansell for many years.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry O. Hanks, State Mineralogist.

ANNUAL STATISTICIAN of 1881.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 816 California st. Price, $4.

1851. 1881.
DEPUTY U. S. MINERAL SURVEYOR.
Surveys for Location or Patent. Maps and Plans Drawn. Mining Properties of all kinds examined and careful reports made of the same. Consultations on Mining Investments. Address, THOS. W. REESE, CIVIL ENGINEER, Oroville, Butte Co., Cal. References given and required.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

REGULAR DIVIDEND NOTICE.

OFFICE OF

Northern Belle Mill and Mining Company,

SAN FRANCISCO, CAL., NOVEMBER, 10, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 56), of fifty cents (50 cents) per share, was declared, payable on Tuesday, November 15, 1881. Transfer books closed on Friday, November 11, 1881, at 3 o'clock P. M.

WM. WILLIS, Sec'y.

Office—Room No. 29 Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF

Northern Belle Mill and Mining Company,

SAN FRANCISCO, CAL., NOVEMBER, 10, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, an extra dividend [(No. 57), of twenty-five cents (25 cents) per share, was declared, payable on Tuesday, November 15, 1881. Transfer books closed on Friday, November 11, 1881, at 3 o'clock, P. M,

WM. WILLIS, Sec'y.

Office—Room No. 29 Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company,

SAN FRANCISCO, NOVEMBER 8, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 23) of Twenty-five Cents (25c) per share was declared, payable on TUESDAY, November 15th, 1881, at the office of the Company, Room 19, No. 328 Montgomery street, San Francisco, California. Transfer books will be closed on November 9th, 1881, at 3 P. M.

JOSEPH NASH, Sec'y.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

SAN FRANCISCO, CAL., NOVEMBER 2, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 34, of seventy-five cents (75 cents) per share was declared, payable on Saturday, November 12, 1881, at the office in this city, or at the The Farmers' Loan and Trust Company in New York. WM. WILLIS, Sec'y,

Office—Room No. 29, Nevada Block, No. 300 Montgomery St., San Francisco, Cal.

Newcastle Gold Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Yankee Hill Mining District, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Twenty-third (23) day of September, 1881, an assessment, (No. 2) of two (2) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 33, No. 318 Pine St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the First (1) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Twenty-first (21) day of November, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

E. G. MATHEWS, Sec'y.

Office—Room 33, No. 318 Pine St. San Francisco, Cal.

POSTPONEMENT.—The day of delinquency of the above assessment is hereby postponed to the fifteenth day (15) of November, 1881, and the day of sale to Monday the fifth day (5) of December, 1881. By order of the Board of Directors, November 2, 1881.

E. G. MATHEWS, Sec'y.

Franklin Gravel Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Dutch Flat, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the Fourteenth (14) day of October, 1881, an assessment, (No 7) of Thirty (30) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 310 Pine street, Room No. 44, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fourteenth (14) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Fifth (5) day of December, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

GEO. R. SPINNEY, Sec'y.

Office—No. 310 Pine St., Room No. 44, San Francisco, California.

F. MANSELL & CO.,
Sign and Ornamental Painters,
NO. 434 PINE ST., SAN FRANCISCO,
(Opposite their old stand.)
Fancy Glass Work, Gold Block Letters, Etc.

THE FRANKLIN GIRDER!

BY FAR THE MOST ECONOMICAL OF ANY CONSTRUCTION MADE.

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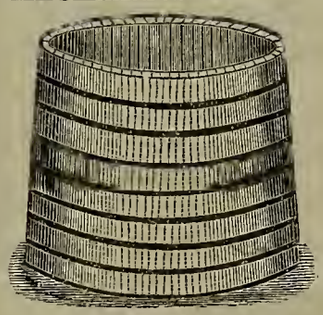

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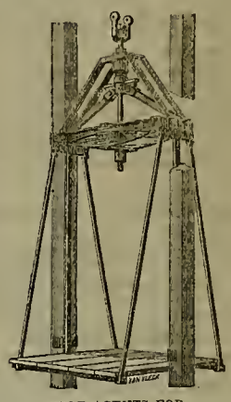

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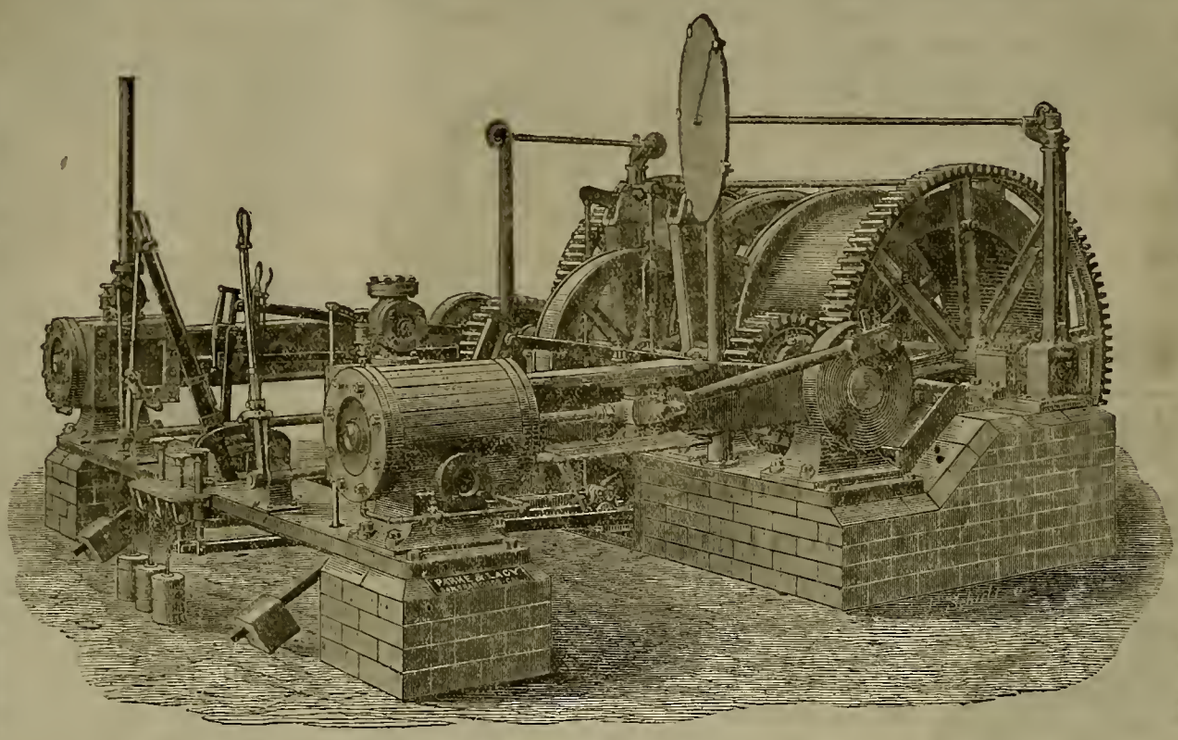

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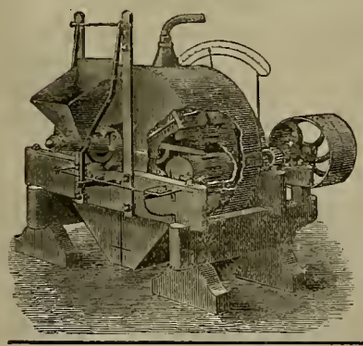

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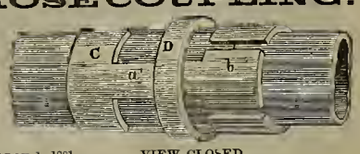

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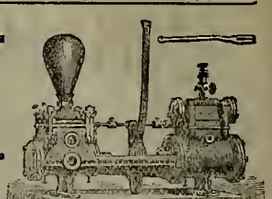

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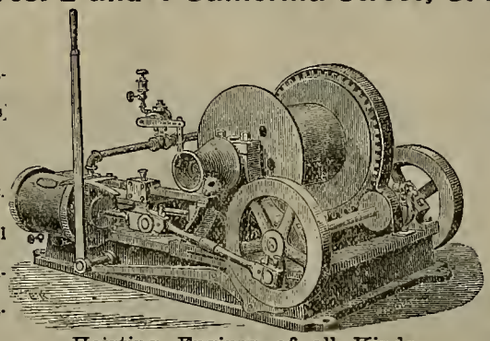

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Orders may be addressed to us at any of the following places at each of which we carry a stock.

SAN FRANCISCO, CAL.
Nos. 2 and 4 California Street.

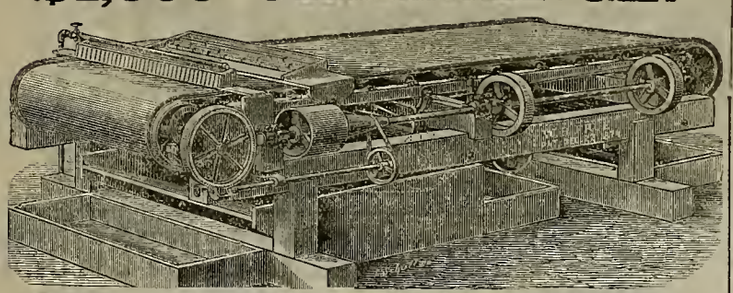
PORTLAND, OREGON,
No. 43 Front Street.

CHICAGO, ILLINOIS.
Nos. 152 and 154 Lake Street.
And 40 Franklin Street.

ST. LOUIS, MISSOURI,
No. 209 North Third Street.

ST. LOUIS, MISSOURI,
Nos. 811 to 819 North Second Street.

$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR.

Nearly 300 are now in use, giving entire satisfaction. Awarded First Premium and Silver Medal at the Industrial Fair for 1880 of the Mechanics' Institute of San Francisco, Cal.

Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.

We challenge any other Concentrator in use for a fair and impartial competitive trial, side by side, for stakes of $1,000 each, and we mean business.

☞ A machine with all improvements can be seen in working order and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont street.

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GIANT POWDER

MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS.

Nos. ONE, TWO and THREE.

Stronger, Better and Safer than any other High Explosive

Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞ Triple Force Caps and all Grades of Fuse.

BANDMANN, NIELSEN & CO.,
SAN FRANCISCO, CAL.

COMPOUND OXYGEN — NOT A DRUG

A NEW TREATMENT for Consumption, Asthma, Bronchitis, Catarrh, Dyspepsia, Headache, Debility, Neuralgia, Rheumatism, *and all Chronic and Nervous Disorders.*

ACTS DIRECTLY upon the great nervous and organic centres, and *cures by a natural process of revitalization.*

HAS EFFECTED REMARKABLE CURES, which are attracting wide attention.

HAS BEEN USED BY Rt. Rev. John J. Keane, Bishop of Richmond, Va., Hon. Wm. D. Kelley, T. S. Arthur, and others, who have been largely benefited, and to whom we refer *by permission.*

IS STRONGLY ENDORSED: "We have the most unequivocal testimony to its curative power from many persons of high character and intelligence."—*Lutheran Observer.* "The cures which have been obtained by this new treatment seem more like miracles than cases of natural healing."—*Arthur's Home Magazine.* "There is no doubt as to the genuineness and positive results of this treatment."—*Boston Journal of Commerce.*

THE OXYGEN HOME TREATMENT contains two months' supply, with inhaling apparatus and full directions for use.

SENT FREE: a Treatise on Compound Oxygen, giving the history of this new discovery and a large record of most remarkable cures. Write for it. Address

ADMINISTERED BY INHALATION. Drs. STARKEY & PALEN, 1109 and 1111 Girard St., Philadelphia, Pa.

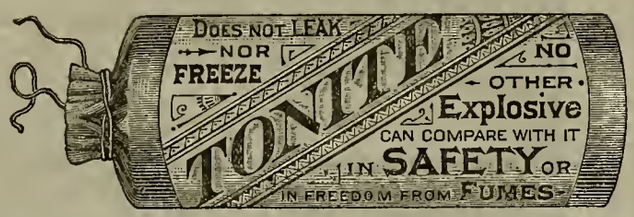
Depository on Pacific Coast.

WE HAVE ESTABLISHED A DEPOSITORY OF OUR COMPOUND OXYGEN HOME TREATMENT at San Francisco, Cal. This will enable patients on the Pacific Coast to obtain it without the heavy express charges which accrue on packages sent from Eastern States.

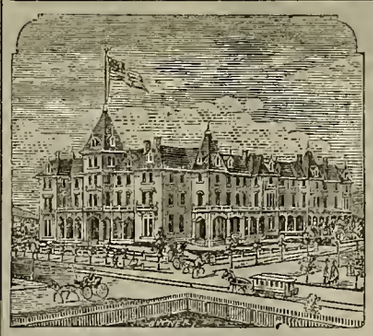
All orders directed to H. E. MATHEWS, 606 Montgomery street, San Francisco, Cal., will be filled on the same terms on which we fill orders sent directly to our office in Philadelphia.

Patients ordering from our depository in San Francisco, should, at the same time, write to us, and give a statement of their case, in order that we may send such advice and direction in the use of the Treatment as their special disease may seem to require.

DRS. STARKEY & PALEN, Nos. 1109 and 1111 Girard Street, Philadelphia, Pa.



TONITE POWDER COMPANY, - - 403 California St., S. F.



TUBBS HOTEL,

East Oakland,

Having been Thoroughly Refitted and Refurnished, Painted and Frescoed, is now Open for the Reception of Guests. Rooms can now be secured at the Hotel.

S. I. KELLOGG, PROPRIETOR.

REMOVAL NOTICE.

The Sweepstake Plow Company's Works have been removed to

Benicia from San Leandro.

ADDRESS IN FUTURE:

BENICIA AGRICULTURAL WORKS,
Benicia, Solano County Cal.

PACIFIC POWER CO.

Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

PEBBLE SPECTACLES.

Muller's Optical Depot,
135 Montgomery St., near Bush.

SPECIALTY FOR 30 YEARS.

WHOLESALE AND RETAIL.

The most complicated cases of defective vision thoroughly diagnosed, free of charge. Compound Astigmatic Lenses Mounted to order in *Two Hours* notice.

☞ Orders by mail promptly attended to.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, NOVEMBER 19, 1881.

VOLUME XLIII Number 21

Wood-Working Machinery.

Messrs. Parke & Lacy, of 21 and 23 Fremont street, have recently added to the branches of business they represent, by keeping on stock a large amount of wood-working machinery, saw mills, etc. For saw mills, etc., there is quite a demand in many directions, even in Mexico. This is due to the rapid growth of the railroad systems of the country and the increase of our mining area. Many mining companies find it is more profitable to purchase the saw mill machinery and get out their own lumber than it is to purchase lumber, when the latter has to be transported any distance.

Messrs. Parke & Lacy are now agents for this coast for Witherby, Rugg & Richardson's wood-working machinery, and keep in stock a full line of these goods.

We illustrate on this page a machine made by this firm especially to meet the requirements of this coast. It is called the California planing, tonguing and grooving machine.

This machine has been perfected with great care, and is built from new patterns of the most approved styles, with Burleigh's patent expansion feed gear links; also improved weighted feed rolls, self-adjustable to the variations in thickness of lumber. The rolls are weighted so that the lumber passes through before it reaches the cutter head, giving at all times an equal pressure in all the irregularities of the lumber, which cannot be obtained otherwise.

It has four six-inch feed rolls; the cutter head is six inches in diameter, carries three cutters, is made of solid cast steel, running in the best of babbit lined patent self-oiling boxes. All the gears are protected by substantial covers, thereby preventing breakages or accidents. It will plane, tongue and groove 14 inches wide. Will plane 24 inches wide and 5 inches thick when the matcher heads are off. The matcher head is moved by a crank both on the end and side of the machine, with an index to gauge the width and thickness of the board. Tight and loose pulleys, 14 inches diameter, 6-inch face, and should make 750 revolutions per minute. Length of belts, 37 ft. of 4-inch, for upper cylinder; 18 8 12 ft. of 4 inch, for under cylinder; 35 9 12 ft. of 3-inch, for matchers; 14 6 12 ft. of 3 inch, for feed. Power required to drive planer, 12-horse.

California Silk Culture Association.—Hon. Irving M. Scott will deliver a lecture on India at the Mercantile Library hall on Saturday evening, Nov. 19, for the benefit of the California Silk Culture Association. The ability of the lecturer is widely recognized, and the object for which he will speak is in every way worthy of generous encouragement. As most of our readers well know already, the California Silk Culture Association is composed of a group of public spirited ladies who are laboring to promote the silk industry in California, and they have already attained most satisfactory results. We trust they will be aided onward by a full house at Mr. Scott's lecture. This society held its regular monthly meeting at the Academy of Sciences, on Thursday evening last. Several interesting papers were read, treating upon the progress and importance of silk culture and silk manufacture in this country. In order to encourage the introduction of silk culture, the rearing of worms and the production of eggs, the society last year distributed quite a number of eggs to different parties throughout the State, and it proposes doing the same the coming season. Eggs will be furnished gratuitously to such as are living in localities favorable for such culture, and are unable to pay for the same. Purchases of eggs will also be made of such persons as have healthy ones for sale of their own raising. Applications may be made to Mrs. Marwedell, 1711 Van Ness avenue. Mrs. Thomas Varney, Mrs. P. H. Barclay, Mrs. B. F. Holbrook and Mrs. Laura De Force Gordon were elected members of the association.

Reports received at the Mint Bureau, in reply to circulars recently forwarded by Director Burchard show that during the fiscal year ended June 30, 1881, the value of gold consumed by manufactures aggregated about $10,000 000. More than $3,000,000 of this amount was in United States coin. The reported consumption of silver during the same period was equivalent to $3,000,000.

The mineral belt at Butte, Mon., is over three miles long from north to south, and some two miles wide from east to west. The course of the veins is east and west, and the dip is generally to the south. The ledges are from 6 inches to 15 ft. in width. The ore is base, and must be roasted or smelted.

Sheaves for Hoisting Works.

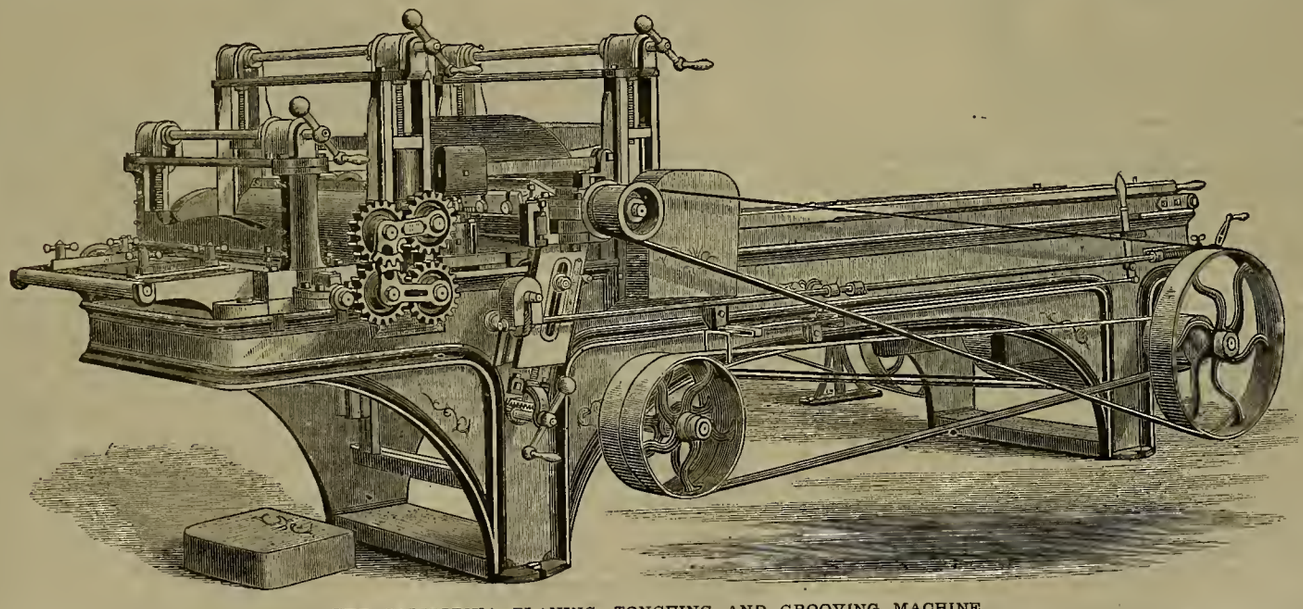
In discussing the question of the mechanical engineering of mines, Mr. C. M. Percy, a member of the Institute of Mechanical Engineers, and author of "Winding and Overwinding," etc., calls attention, in a recent lecture, to the care which should be exercised in constructing head gears to proportion the pulley bearings correctly. The pulley axle should be so strong as to make accident impossible, but we ought to have strength, and also such an axle as will give the least amount of frictional resistance.

In view of Mr. Percy's wide experience, and his practical knowledge on this subject, his conclusions will be of interest to our miners and foundrymen. We must bear in mind that all the load rests upon the bearings of the axle, and that the friction of bearings increases with the load and also with the distance traveled. We cannot help the load, but we can reduce the distance which the bearings travel, or rather are traveled upon, in two ways—namely: First, by keeping the pulley as large as possible, and, second, by keeping the journals as small as possible. This can be made clear by a simple illustration. Suppose a head gear pulley, seven ft. in diameter, and a journal, eight inches in diameter, for a pit 300 yards deep. The pulley will revolve 40 times each winding, and the distance traveled by the journal upon its bearing will be 85 ft. each winding.

Suppose, for the same pit, a pulley 14 ft. diameter and a journal 4 inches diameter. In this case, the number of revolutions will be 20½, and the distance traveled by the journal upon its bearings 21¼ ft., being only one-fourth of the amount in the previous result. A headgear pulley axle made of the class of wrought iron to which axles are entitled, in which a bar 1 inch square and 12 inches between the supports, will have a breaking stress not less than 3,500 lbs., does not need great dimensions to make it strong. An axle, with journals 4 inches diameter and measuring 2 ft. inside the journals, will have an ultimate breaking strain of 35 tons, and would thus, with a factor of safety—10—allow a safe working load of 3½ tons. The moral of all this is, construct headgear pulleys large and their axles small.

J. H. Rooney, late superintendent of the Sierra Nevada mine, has been presented by the employees of the Union shaft with a fine diamond ring.

Electric Light Dangers.—From late accounts it appears that electric lights and electric motors are not precisely the things a man wants to introduce into the bosom of his family. Kerosene is lingering, and corrosive sublimate mild compared to the innocent, slender wires which one instinctively fingers "to see how they go," and never knows what hurts him. Imagine an Irish Biddy or inquisitive porter in charge of the battery of an electric light, and wanting to turn the light up higher for company. Tenth street would be a perpetual procession of funerals en route for Calvary cemetery. Or, picture that blessed infant who is always eating matches, spilling carbolic acid, or nibbling beetle poison, attracted by the enticing array of the open battery closet, which your wife would infallibly forget to lock some day, or leave with the key in the lock. How long before Edison would be a name of horror in American families, and a frantic cry be raised for a return to pine knots and lard-oil lamps and the sweet safety of primitive methods.



THE CALIFORNIA PLANING, TONGUING AND GROOVING MACHINE.

An Inventor's Troubles.—Wm. P. Stevenson has commenced proceedings against Theo. R. Andrews and T. W. Sterling, to declare void a contract entered into on the 30th of last March, whereby Stevenson agreed to transfer to Andrews a half interest in letters patent which he was about to obtain for his improvement in hand rock drills. The cause of action is identical with the one brought a week ago to recover $86,000 damages. Stevenson also prays that a deed of conveyance be executed to him of all interest which the defendants have obtained in the letters patent; and that they deliver to him all machinery made in accordance with the invention.

A compromise has been effected between the National Millers' Association and the George T. Smith Middlings Purifier Co. by which the law suits brought by the latter against most of the prominent millers of the country, for the alleged infringement of what is known as the Cochrane patents. The suits which the Purifier Co. brought against the millers in this country aggregate in amount $36,000,000.

The product of the Leadville mills, smelters and placers for the third quarter of 1881 was $3,170,245.

The Mineral Hill Mine.

This mine is situated about 15 miles east of the town of Bishop Creek, and at the head of what is known as Black canyon. The mouth of the canyon lies about midway between Bishop and Big Pine, in the Inyo range. A road runs nearly its entire length, a distance of 12 miles. The head of the canyon opens out into a beautiful little flat, surrounded by hills, covered with pinon. At the upper end of this flat several springs of pure water bubble from the ground, which joining their forces, furnish an unfailing supply that would be amply sufficient to run a quartz mill or smelting furnace. About two miles above the springs is situated the mine, on a spur of the Inyos, running northeast by southwest. The ledge crops out along a sharp ridge, or backbone, in a formation of quartzite and lime. Considerable work has been done in the way of numerous small holes from 5 to 15 ft. in depth, scattered over the western face of the hill, and nearly all of them showing ore. From near the bottom of the hill a tunnel has been run 560 ft. in length to cut the ledge. For reasons unknown the work on this tunnel was stopped when within 200 ft. of the ledge. This tunnel would have tapped the vein about 500 ft. below the croppings. About 300 ft. above this work another tunnel has been run about 75 ft., which has cut the ledge, and about 20 tons of first-class smelting ore have been taken out. The gangue or waste of the ledge is principally calcite. Assays of several samples of the different grades of the ore show from $60 to $100 per ton in silver, and 45% of lead. The ore is composed of carbonates, oxides and sulphide of lead, and is well adapted to smelting. The mine is very conveniently situated for working. Fir timber covers the hills, and a wagon road can be easily made from the springs directly to the mine. The facilities for smelting ores at this point are unequaled. An almost inexhaustible supply of wood is close at hand, and charcoal could be delivered at a furnace for 15 cts. a bushel. The mine is owned by Uncle Peter Laird, and it has been appropriately named Mineral Hill—as the whole hill is apparently a mass of ore. At an early day this fine property will be developed and produce bullion, for we are confident that it is one of the best prospects for an unlimited quantity of smelting ores to be found in Inyo county.—*Inyo Independent.*

Not All Dead Work.

Says the Virginia *Enterprise:* The dead work now in progress at several points must presently come to an end. Indeed, much work that is now going forward cannot properly be called dead work. The crosscuts on the 2500 level of the Sierra Nevada mine are really going forward into and exploring new ground, and even the two drifts on the 2700 level of the Sierra Nevada and Union Consolidated—that going east from the Union shaft and that being run west from the joint winze to meet it—can hardly be spoken of as being dead work, as they are liable to cut the ore found above on the 2500 level; though, of course, said ore body may strike down on one side or the other of those drifts.

In the Ophir and Mexican they are actively engaged in exploring the vein on the 2900 level, and are liable at any time to find ore. This is the deepest work that is being done at the north end of the Comstock, and it is in what is for several reasons very interesting ground. Much was said about it a year or two ago, but now that the work of exploration then looked forward to is in actual progress only a few persons are giving it much attention.

In one way and another a good deal of new ground is being broken in the old bonanza mines—the California and Consolidated Virginia. All there is not, strictly speaking, dead work. No man can see an inch ahead of the picks, and ore is liable to be broken into wherever the picks are kept going. Where the Hardy vein was first cut in the Ophir—a vein which yielded nearly $2,000,000—all was solid and most unpromising porphyry to within two inches of the ore. It was, indeed, a body of rich, black sulphuret ore lying in the midst of a solid mass of porphyry. The clay seams separating the ore from the porphyry were hardly two inches in width on either side.

At the Yellow Jacket, crosscuts are now in progress on the 3000 level, and although these are still in ground that is hard and dry, they are liable at any time to cut into something more promising, even though it may not at first be ore that is encountered.

The Savage folks are drifting into ground that has never been explored, and are, therefore, likely to make discoveries of value, and at the Potosi the work of exploration on the 2400 level has only been suspended temporarily, and will be resumed as soon as better ventilation has been secured. Active operations will also be resumed by the Imperial and Alpha people in a day or two. Thus, although there is a considerable amount of dead work in progress, it cannot all be so designated, and while active exploring work is being done something is liable to turn up.

KLAMATH RIVER claims have escaped damage by the recent storm, except Austin & Co's, near the mouth of Scott river, which was filled by a break in the west dam of the China company below. They realized in the closing week 505 ounces, and took out $1,100 in the last three hours.

Nevada's Bullion Product.

The following table shows the gross yield of the mines in the State of Nevada, by counties, in gold and silver, for the six months ending Dec. 31, 1880:

	Tons.	Gross Yield.
Elko	5,224	$ 291,180.83
Esmeralda	19,178	818,957.50
Eureka	41,040	1,600,783.17
Humboldt	10,753	110,333.15
Lander	2,884	349,187.53
Lincoln	5,888	98,123.33
Lyon	29,612	175,286.97
Nye	12,151	273,881.37
Ormsby	43,404	234,913.11
Storey	92,863	1,478,774.34
White Pine	26,578	257,397.08
Totals	289,578	$5,689,323.25

The fraction of tons amounting to 3½, were omitted from the above column, but appear in total.

Net Bullion Product—	
Quarter ending Sept. 30, 1880	$ 865,470.24
Quarter ending Dec. 31, 1880	760,005.85
Total	$1,625,476.09

The following table shows the gross yield in gold and silver for the six months ending June 30, 1881:

	Tons.	Gross Yield.
Elko	2,488	$ 122,193 21
Esmeralda	19,436	749 521.83
Eureka	38,824	1,612,774.51
Humboldt	5,017	45,611 16
Lander	3,976	491,235.97
Lincoln	6 625	80,559.61
Lyon	39,760	146,778.61
Nye	6,551	188,908.45
Ormsby	7,075	35,321.21
Storey	48,857	861,831.10
Washoe	9,640	18,588 87
White Pine	5,056	189,283.28
Totals	186,339	$4,542 507 07

The fractional tons omitted in the above column amount to a little less than 5, and are added in the total.

Net Bullion Product—	
Quarter ending March 31, 1881	$ 670,748.99
Quarter ending June 30, 1881	628,873.11
Total	$1 299,622.10

Recapitulation.

Gross yield of gold and silver bullion for the 12 months ending June 30, 1881.

	Tons.	Gross Yield.
Elko	7,713	$ 413 374 04
Esmeralda	38,614	1,568,479.33
Eureka	79,895	3,213,557.68
Humboldt	15 770	155,949 31
Lander	6,860	840,423.50
Lincoln	12,514	178 682 99
Lyon	69 372	322 065.40
Nye	18,702	462,789.82
Ormsby	50,479	270,234.18
Storey	141,750	2,340.505 44
Washoe	2,640	18 588 87
White Pine	31,634	447 180.36
Totals	475,918	$10,231,830.92

Fractional tons were omitted from the above column, but added to the total.

Total net product (taxable) after deducting cost of extraction and reduction for the year ending June 30, 1881, $2 925,098.19.

HYDRAULIC GOLD.—The hydraulic mines tributary to this city—that is, which ship their gold this way—says the Nevada *Transcript* of November 10th, have produced less than $500,000 worth of bullion during the past five months, as a result of the litigation into which they have been forced by corrupt lawyers and ignorant grangers. In August, when all of the mines of note were idle, only about $50,000 was taken out in this part of the county. The period following that month was the most distressing one ever experienced in Nevada county. Not only were the laboring miners reduced to desperate straits, but thousands of mechanics, business men and other citizens shared in the terrible and never-to-be-forgotten condition of affairs. Those who were not of us then can never realize the unhappiness of that time. Hundreds of good men with families roamed here and there aimlessly, begging without avail for just enough work to keep body and soul together in their poverty-stricken homes. Had it not been for less unfortunate neighbors who had well-stocked larders and were willing to divide their last crust, the outcome would have been most disastrous.

A DISPATCH from El Paso, Texas, says that an enormous body of very rich gold, silver and copper carbonates, 40 ft. thick, has been struck in the Memphis mine, Orange mountains, east of Las Cruces. All the Germans engaged in the Batopilas Consolidated, Mexico, have stampeded; 15 were drowned while on the way to Chihuahua city. All the miners in the Cusihuiriachic and Santa Enlalia mines, near Chihuahua city, have struck because of ill-treatment and the alleged failure of the New York contractors who engaged their services. Heavy strikes of gold and silver ore are reported from Dolores district, west of Chihuahua. Stage passengers from Chihuahua report that Indians are causing great trouble to miners north and west of the city.

AT Battle Mountain, miners' wages are $3.50 per day, 10 hours, though some pay $4 in wet shafts. Carpenters' wages are from $5 to $6 per day, and stone masons $7 per day. Lumber is selling for $40 per thousand, and wood retails at from $7 to $8 per cord. Board is from $6 to $8 per week.

ISAAC THOMAS, formerly engaged in mining at Ophir, Placer county, and afterward superintendent of the Placerville Gold Quartz Co.'s mine, died at Placerville last week.

Assessments in November.

Thirty-two mines in California, Nevada and Arizona have assessments pending to become delinquent this month. These assessments show an aggregate of upwards of $1,000,000. With the exception of April and August, the above is the largest amount delinquent in any month this year. It is considerably more than will be got out of the mines in the same districts in the form of dividends this month. The assessment roll for November, which we take from the *Bulletin*, is as follows:

	Per Share.	Amount.	Del. Nov.
Belcher	$ 1 00	$104,000	1
Benton Con	25	27,000	18
Bodie Tunnel	50	50,000	24
California Gold	10	10,000	9
Caledonia	25	25,000	2
Eintracht Gravel	5	5,000	2
Excelsior W. & M	50	50,000	9
Golden Fleece	40 00	40,000	30
Goodshaw	15	15,000	17
Godfrey	2½	2,500	1
Grand Prize	25	25,000	16
Hale & Norcross	50	50,000	9
Iron Cap	2	2,000	17
Lord of Lorn	10	10,000	17
Mayflower Gravel	10	5,000	16
Mexican	1 00	100,800	8
Mono	1 00	50,000	9
Morning Star	25	20,000	22
Mt. Potosi Con	25	25,000	21
Noonday	25	25,000	29
Old Channel Gravel	1½	1,500	12
Ophir	1 00	100,800	3
Overman	50	57,600	17
Quartz Mountain	75	7,500	14
Rocky Point	5	5,000	14
Sierra Nevada	1 00	100,000	10
Star	10	10,000	28
Tuscarora Mill	25	15,000	22
Union Con	1 00	100,000	14
Utah	2 00	40,000	16
Wedge Consolidated	2½	2,500	14
Yellow Jacket	1 00	120,000	9

The money will be apportioned as follows, as to locality:

Nevada—		
Storey county	$ 841,200	
Elko	40,000	
Esmeralda	25,000	
White Pine	10,000—	$916,200
California—		
Mono county	150,900	
Placer	50,000	
Yuba	50,000	
Tuolumne	7,500	
Sierra	5,000	
Nevada	2,500	
Butte	1,500—	266,500
Arizona—		
Cochise county	2,500	
Yuma	2,000—	4,500
Total	$1,187,200	$1,187,200

Some of the mines in the above list have had a varied career, while the history of others shows one continuous demand on stockholders without a single compensating feature. Belcher has been twice on the dividend list, and has paid altogether $15,397,200, but it has not paid a dividend since April, 1876. Most of the $2,432,000 in assessments for this mine has been levied in the last five years. There are those who still believe that Belcher will again come to the front as a prosperous mine. The Benton Consolidated mine has called upon stockholders six times since its reorganization a few years ago. The demands have been small, the total being only $270,000, but there have been no dividends. Flattering prospects have been accorded to Bodie tunnel by interested parties, but dividends are still delayed. In the meantime, five assessments of $80,070 have been levied. The California mine mentioned above is in Mono county, and it is still an assessment proposition. The Caledonia mine of Storey county has severely tested the patience and faith of its owners, having called for $2,085,000, but not a dollar has it given back. The Eintracht gravel mine is in Sierra county, and hopes are expressed that it will eventually more than pay back all it has required for its development. The Excelsior water and mining company's property is in Yuba county. The mine was paying nicely until the agitation of the debris question, and the present assessment is understood to meet an expense for impounding its tailings, so that work may be renewed without prejudice to any one.

The Godfrey is a gravel claim in Nevada county that is expected to be remunerative some time. The most we know about the Golden Fleece mine of Placer county is that its assessments are always for large amounts per share, and the above is the 23d assessment. The Goodshaw is in Mono county, and it has called for $160,000. The Grand Prize has had its ups and downs. It has paid $450,000 in dividends, the last one being paid in September, 1880, and it has levied $340,000 in assessments. It is now in an embarrassed condition. Hale & Norcross has been long before the public, and it has had its days of prosperity and adversity. It has probably levied more assessments than any other mine on the Comstock lode. The present is unmbered 71, showing a total of $3,754,000, against $1,598,000 in dividends, the last of which was paid in April, 1871. Thus for over 10 years this mine has been a burden to the owners. The Iron Cap is in Yuma county, Arizona, and four small demands have been made. Only two assessments have been levied by the Lord of Lorn of Storey county. The Mayflower is a gravel claim in Placer county. The Mexican is the northern half of the Ophir mine, and the assessments levied by it aggregate $1,783,000. The Mono is the southern half of the Bodie. Its assessment account foots up $450,000. Both Mexican and Mono were launched on the reputation of their better halves. The above is the first assessment on the Morning Star, which is a Storey county claim. The Mt. Potosi Con. has had great trouble in collecting late assessments, on account of litigation respecting the management. It is presumed that the present tax will be paid, as the difficulties appear to have been settled. The Noonday has called for $93,000, in addition to the value of the bullion produced from ore raised. The Old Channel is a gravel claim in Butte county. The Ophir claim is one of the first discovered on the Comstock lode. The mine has had several periods of prosperity, but is now in horasco. The assessments aggregate $3,143,400, to which should be added those collected by the Mexican, making a total of $4,976,400, against $1,595,800 in dividends, the last of which was paid in January, 1880. The Overman mine has been before the public for nearly a score of years. In the meantime, it has called for $3,518,300, but there is very little to show for the outlay. The Quartz Mountain is in Tuolumne county, and there have been 13 assessments. The Rocky Point is a Placer county claim. Sierra Nevada has levied 70 assessments, the total aggregating $4,650,000, and most of this sum has been collected within the last five years. Prior to 1871, it paid $102,500 in dividends. The Star mine has been producing from $20,000 to $30,000 in silver per month for some time and yet it has asked for $180,000. The Tuscarora has called for $110,000. Union Con. and Utah have paid no dividends, but the former has collected $1,260,000, and the latter $1,230,000 in assessments. The Wedge Con. is in Cochise county, Tombstone district, Arizona. Its first assessment of five cents per share, levied in September last, was rescinded in October, when the present one was substituted. It is a little over 10 years since Yellow Jacket paid its last dividend, and the total is $2,184,000. Assessments, however, have been kept up with great regularity ever since. The original capital was all paid up in this way. Then the capital was increased to $12,000,000, and the total paid on account is $5,238,000. The Comstock lode has not yielded a dividend since August, 1880, and it is difficult to give an idea when the next one will be paid. The delinquent assessment roll for the first 11 months of the year compares as follows:

	Mines.	Amount.
January	30	$ 780,500
February	29	880,400
March	29	417,400
April	39	1,068,450
May	28	678,800
June	29	754,810
July	30	570,900
August	33	1,218,300
September	32	809,000
October	31	633,250
November	32	1,187,200
Totals	342	$9,005,010
In 1880	439	12,038,800
In 1879	463	13,921,100

THE BIG BEND TUNNEL.—Innumerable questions are asked by gentlemen as to whether the proposed tunnel on the Big Bend will have the capacity to carry the water. In conversation with engineer McGann, who has done a greater part of the surveying, and who has made the calculations and drawn the plans, we learn the following facts in relation to the project: The size of the flume that was put in the river of the old Cape claim, years ago, was 40 ft. wide and 4 ft. deep, making a sectional area of 160 cubic ft., with a grade of six inches to 100 ft. This was of sufficient size to carry the water of the main Feather at its low stage. The Big Bend tunnel will be 18 ft. wide, 12 ft. high, with a vereed sine of 3 ft. The area of the wet section will be 216 cubic ft., and it will have a grade of 53 ft. to the mile. That zone in the upper portion of the tunnel is calculated for air passage. This tunnel will carry nearly double as much water as there is in the main Feather river at its ordinary hight, and has the following facts in its favor: That it is only required to take what water there is in the North fork, while the Cape flume had to contend with the waters of the West branch, South fork, Middle fork and North fork. Consequently, it is safe to assume that a tunnel of the above capacity will take all the waters of the north for at least seven months in each year. Mr. McGann has just returned from a trip up the Big Bend, and states that Mike Wells, who has the contract to build the road to the mouth of the tunnel, has 15 men at work already, and part of the road is completed. The boarding-houses have been erected, and everything is being pushed ahead with great rapidity.—*Oroville Mercury.*

HOW THEY DO IT DOWN IN MAINE.—The following, from the Maine *Mining Journal*, shows how they run the mining stock business in that land of booms: "We suppose there must be a parcel of bandsome and talented brokers getting together on the floor of the mining board and tossing a certain stock about from one to another until 'sales' have amounted to many thousand shares, while not a half a dozen shares have changed hands, and then publishing in the evening and morning papers a quarter of a yard of reported 'transactions;' but to the unappreciative outsider, it would seem that full-grown men should be in better business."

A RICH MINE.—The Natchez mine, near Dun Glen, in Humboldt county, which was abandoned some years ago, was relocated lately, and shows up very rich. At 25 ft. below the surface a ledge was uncovered three and a half ft. wide, six inches of which is in ore that assays from $500 to $1,000 to the ton, and the rest of which goes $75. It is a contact vein, having a limestone hanging wall and porphyritic foot wall.

MECHANICAL PROGRESS.

Joining Substances by Pressure.

About two years ago several experiments were made by Walthere Spring in regard to joining substances by pressure, the pressure used being, in many instances, as high as 20,000 atmospheres. Nitrate of potash and nitrate of soda were compressed from the state of powder into small hard blocks, which were more solid than if made by fusion, and the original separate particles composing them could not be traced.

The possibility being thus proved of uniting solids by pressure, it remained to extend the experiments over a large number of substances, to make trials in a vacuum, and to ascertain the effect of temperature on the readiness with which the union could be produced. In the preliminary experiments of Mr. Spring, the compression was effected by a ram working in a steel cylinder by means of a screw and hand lever. The solid blocks produced were, however, very difficult to get out whole, and the pressure exerted upon them could only be roughly estimated. In the late experiments, therefore, the pressure was produced by loading a lever with dead weights, and the cylinder or die in which the substances were compressed was composed of two separable parts, held together tightly at the top by a nut, the lower part fitting into a recessed base plate; they could thus be taken apart for getting the compressed block out without injuring it. The die was covered by a gun metal bell or air-tight receiver, from which the air could be exhausted for experimenting in a vacuum. The ram, loaded by the lever, passed into the cylinder through a stuffing box in the top of the bell. It was found, however, that the pressure could not be increased beyond 10,000 atmospheres, the steel ram itself crushing at this limit, being replaced by another after each operation. The presence or absence of air had scarcely any perceptible effect in the experiments, and on this account, together with the fact of the crushing of the ram, the old apparatus with the screw was ultimately adopted again.

In regard to trying the substances in a heated state, it should be observed that those giving good results without it, were not tested in that way. Eight metals were tried by Mr. Spring, and all except zinc were compressed at a temperature of 57° F. From lead filings, compressed in a vacuum under about 2,000 atmospheres, a block was obtained as solid as if cast by melting, and the microscope failed to detect the slightest trace of the original constituent particles. At 5,000 atmospheres the lead would no longer stand under the ram, but oozed out through all the joints like a liquid, allowing the ram to be driven down to the very bottom of the die. On opening the die, the fine flakes of lead leaf had exactly the appearance of sheet lead produced by rolling, conformably with the result of M. Tresca's experiments on the flow of solids. The specific gravity of the compressed lead was found to be 11.5 instead of 11.3. Bismuth, though so brittle and easily pulverized, yet joins again readily under pressure; a block compressed from fine powder under 6,000 atmospheres breaks with a crystalline fracture, just as though it had been cast; and the same holds true for almost all the other substances tried. Tin filings join perfectly under 3,000 atmospheres; at 5,000, the tin begins to flow out through the joints of the die, but soon stops; at 5,500 begins again, and again stops; and so on up to 7,500 atmospheres, under which pressure the flow becomes continuous.

Zinc filings join perfectly under 5,000 atmospheres, and under 7,000, the compressed block barely begins to flow. Joining less readily than the other metals already cited, zinc forms a good illustration of what takes place also in the compression of all the other substances tried, proving that union depends solely on the closeness with which the particles are brought into contact. Under no more than 260 atmospheres pressure, zinc filings do not join. Under 700 they so far join as to come out of the die in a block, which, however, breaks very easily and then falls to dust; a microscope shows distinct spaces between the filings in the block. Compressed under 2,000 atmospheres, the block will hold together under the file, but breaks under the hammer; its fracture still shows spaces between some of the filings, though much fewer, while others of the particles are now clearly seen to have become perfectly joined. With 4,000 atmospheres, very few interstices can be detected; and with 5,000, the block is perfectly solid throughout, and stands gripping in a vice and filing and hammering like a block cast by melting. A trial was also made of compressing pulverized zinc at the temperature at which it is most malleable, namely, about 266° F. It then joins still better, and the block breaks with a crystalline fracture.

Aluminium joins too weakly under 4,000 atmospheres to stand filing; under 5,000 it stands filing, but not hammering, while with 6,000, it joins perfectly and becomes malleable. The same holds good with regard to copper. In the case of antimony, the trial was not made with filings, but with the finest powder possible, in order to ascertain what pressure would reproduce the metallic luster which is lost in the state of powder. With 5,000 atmospheres, the luster reappeared on the surface of compressed block, but its center remained pulverulent and dull gray; under higher pressures the luster penetrated deeper and deeper in from the surface. Spongy platinum begins to join under 5,000 atmospheres, with metallic luster on the surface; but the block is friable and the fracture dull, and higher pressures do not produce so perfect a union as in the preceding instances. The readiness with which these metals join is seen to be inversely as their hardness, and as the hardness generally diminishes with rise of temperature, it may be concluded that the softer a metal becomes by heating, the more readily will it weld, just as iron gets very soft before melting, and welds easily.

Other experiments were made with metalloids, oxides, sulphides, salts and carbon compounds, which, however, will not be considered here, those given above being of greater practical interest.

INCREASING THE RESISTANCE OF IRON TO TENSION AND TORSION.—M. Seguin, of Paris, has patented a process for increasing the resistance of iron to tension, torsion and transverse strains, by immersing them wholly or partly in hot diluted sulphuric or hydrochloric acid, or in a mixture of one part of turpentine in five or six parts of water. In the acid method the metal is raised to a cherry-red heat, and then dipped in a solution of equal parts, by volume, of sulphuric acid of 60 degrees strength and of water. In the turpentine method the mixture must be kept constantly stirred, lest the spirit should float upon the surface and take fire, on the introduction of the glowing metal. In either process the metal is held in the solution till it has sunk to the temperature of the latter, and is then quickly thrown into cold water. The various implements, such as hooks, levers, beams, etc., subjected to this process, need only be partially immersed in the solution, the portions selected for treatment in each case being, of course, those which will necessarily be subjected to the greater strains when in actual use.

AN EXPANDING MANDREL.—An expanding mandrel recently introduced consists of two parts, viz.: a ribbed split sleeve and the mandrel proper. The sleeve, which is made of steel, is pierced with a tapering hole, and one end of the mandrel is turned to exactly fit this hole. The sleeve is then turned to the required diameter, preferably on the mandrel to which it belongs, after which the material is removed in such a way as to leave three narrow longitudinal bearings with equal depressed spaces between them. These depressions extend very nearly to the bore of the sleeve, leaving only sufficient metal to hold the bearings in position. The sleeve is cut apart through one of these depressions, leaving it free to contract or expand. In using the mandrel, the sleeve is placed in the hole, where, by lightly driving the mandrel into it, expansion will occur, and the three bearing surfaces will be forced into sufficient contact. The contrivance is simple in construction, can be readily and inexpensively made as required for use in a machine shop, and can also be advantageously manufactured and sold as a standard tool.

PULLMAN CARS IN EUROPE.—There are now 47 Pullman cars in use on English and Continental railways, and 10 more in course of construction to be sent abroad. The first Pullman sleeper introduced in England commenced running on the Midland railway in 1874. The English railway officials and the people generally, predicted that the cars were too long to get around the sharp curves of that road, but after a trial had satisfied them that there was no ground for apprehension on this score, the English companies commenced to build larger carriages than they had ever built before.

HOW TO MAKE BRASS SPRINGS.—Brass cannot be tempered in the manner in which steel is tempered. Hence, the only method to make a brass spring is to compress the metal either by rolls or by hammering. If the springs are to be flat, hammer them out to shape in thickness from soft wire, or sheet brass, some thicker than the finished spring is to be. If the brass shows a tendency to crack in hammering, it must be annealed, which can be done by heating to a light red and plunging into water. In hammering use a light hammer, and don't spare the blows.

BUFFALO SKINS FOR GEAR WHEELS.—There seems to be no end to substitutes for iron in the manufacture of gear wheels. The last suggestion is raw buffalo hide. Cement and press together as many layers as are required for the breadth of the wheel. The blanks thus prepared are cut to form the teeth in the usual manner with suitable tools. The advantages claimed are, smooth and noiseless action at very high speeds and greater durability without lubrication.

A NEW MOTOR — ANOTHER KEELY.—The *Schlesische Presse* describes a new motor, which is said to be driven by a new force more powerful than steam, which has the additional advantage that it can be generated in about five minutes, without the aid of fire or water, to attain a pressure of ten atmospheres without emitting any noxious vapors. The particular machine rates two horse-power, while occupying a space of but 11½ cubic ft., and weighs, with the motive power, but 330 lbs. We should be glad to see it.

SCIENTIFIC PROGRESS.

Cosmic Physiology.

At the late meeting of the American Association for the Advancement of Science, Prof. T. Sterry Hunt read a paper entitled "Historic Notes on Cosmic Physiology." The term physiology was used in its general sense as applied to the physiology of the universe. One of the great questions in this direction is an inquiry into the nature of interstellar space, and what is the substance which pervades that vast space. This question was first discussed by the great Arabian scholar Alhosen, and it is a fact worth knowing that he was the first to conclude that the terrestrial atmosphere was of quite limited extent; but he conceived the necessity of some ethereal substance beyond.

There can be no doubt but that beyond our atmosphere, and throughout interstellar space, gaseous particles float, and form some connection between the heavenly bodies. Sir William Grote discussed the probability of a "luminiferous ether," which he identified as Sir Isaac Newton's "chemical particles." The same view was adopted by Sir William Thompson, and more recently by Mr. Williams, who, in his book on "The Fuel of the Sun," advanced the idea that it was these particles of gaseous matter which hoarded the solar heat lost by radiation.

Prof. Hunt then discussed the relations of this spiritous fluid to our planet and other planets. He said that processes have been going on in the chemical changes of the earth from the earliest ages which have absorbed and evolved enormous quantities of gases. For instance, in the manufacture of the limestone rocks of the earth alone, over two hundred times the amount of the carbonite dioxide now in our atmosphere have been consumed. This must have been borrowed from space. He went on to discuss the probability of a chemically-compound ether existing in that interstellar space and pervading the universe just as the atmosphere surrounds the earth, although in minute particles and exceedingly attenuated.

The paper was listened to with the greatest attention, and was discussed with more animation than any other thus far read. It was debated till long after the hour of adjournment, and then postponed till the next day. Prof. Hunt's original ideas are so opposed to existing theories that it is often some time before they are adopted.

IRIDIUM INSTEAD OF CARBON FOR ELECTRIC LAMPS.—A promising improvement has been made in electric lighting by substituting electrodes of iridium for the carbon pencils hitherto almost exclusively used as poles in exhibiting the voltaic arc. Iridium is fusible only in the arc from a very powerful battery, and by keeping the intensity of the current below a given point, the metal can be maintained at a temperature of about 4,000° F., which is far below its melting point, though high enough to add the light of an intense incandescence to the brilliancy of the arc itself. At this temperature the iridium points remain completely unchanged, and the variations and flickerings due to the rapid wearing away of carbon pencils, are entirely absent in the new light; while the consistency with which the source of illumination keeps its place peculiarly adapts it for use in the focus of the Fresnel lenses, or the paraboloic reflectors which in lighthouses or in similar situations take their place. The process by which the iridium, naturally a gritty and intractable powder, is formed into pencils for use in lamps is an ingenious adaptation of a patent issued long ago for making the same metal into points for gold pens, and depends upon the property which iridium possesses of forming a compound with phosphorus, which can then be melted at a temperature of about 3,000° F.—about the fusing point of iron—and molded into masses which can be subsequently dephosphorized, and regain the original infusibility of the pure metal.

THE EARTH'S POLARITY.—Nile's *Weekly Register* for 1836 says that Prof. Lariat, well known at that time as a skilled and scientific balloonist, at one of his ascensions in New York, reached an altitude of about five miles, and proceeded over 100 miles. He passed through clouds of sleet which covered his balloon with icy particles, but what was more interesting, he discovered that when at his greatest altitude, the needle of a compass he had with him did not have the least tendency to exhibit polar attraction, but wavered about at all points of the compass. This circumstance of the earth's polarity at that distance from the surface is worthy of investigation, and merits the attention of scientific minds. We are not aware whether these observations have been corroborated or otherwise by later balloonists.

ALL chemical actions, says M. E. J. Mammene, in *Les Mondes*, may be regarded as actions either of contact or of mixture, and are regulated in the former case by specific gravity and molecular weight—in a word, by the molecular volume of the bodies present, and in the second case by their molecular weight. In the general hypothesis of chemical action which he advances, he rejects entirely the usually accepted notions of molecule and atoms, and substitutes what are conveyed by the terms equivalent and atomic volume.

The Lumber Question.

The question of our future lumber supply was discussed from a scientific point of view at the late meeting of the American Association for the Advancement of Science. The discussion was introduced by the reading of an elaborate paper by William Hosea Ballou, of Evanston, Ill., on "The White Pine: Its Origin and Natural History; Statistics of Its Industry in Michigan; The Coming Substitute for Lumber." This paper possessed much general and commercial as well as scientific value, and if space permitted, would be given in full. We give its concluding portion on the Michigan lumber trade, which will be read with peculiar interest as relating to a region which has recently been devastated by such terrible forest fires.

There are 20,000 vessels engaged in the transportation of this lumber, employing 120,000 men, and valued at $100,000,000.

In the log woods in winter are 50,000 men at work, and 20,000 in the sawmills in summer.

There are 30,000 animals thus engaged, one-third of which are oxen and the remainder horses.

There is a total of 190,000 men, 30,000 animals, and a total capital invested in mills of $111,750,000. The lumber taken annually since 1835, has sold for $1,500,000,000.

The ancient lower limit of the white pine belt extended from Grand Haven to Port Huron, dipping on the west side of the State to Kalamazoo. The whole pine area now comprises 288 townships, in 18 counties, in the lower peninsula, embracing 10,268 square miles, or 6,571,520 acres; in the upper peninsula, 179 townships, or 4,134,160 acres.

It almost seems like a task of despair to hope to raise the forests for another such enormous production. Science will doubtless devise other materials as a substitute. Indeed, I have been shown a material manufactured in Chicago in the shape of a board one inch thick, made from wheat straw, which can be colored to represent any lumber now known, so accurately as to deceive the eye. The inventor manufactures 2,000 square ft. from a ton of straw. It is more durable and much cheaper than lumber. As a parallel to the use of paper wheels, Mr. Pullman is now finishing off palace cars in this material. The limit of its manufacture will depend only on the production of wheat straw.

FAURE'S ACCUMULATORS.—Among the many other practical uses to which Faure's electrical accumulator may be put, it has been suggested that it might be employed to utilize the waste of water power during the hours at which such heavy power may not be employed in ordinary work, as at night, etc. In many localities the circumstances are such that it might be profitably employed in storing up such energy. There is also a very valuable use of the accumulator in its application as an adjunct to the dynamo, regulating the light-giving current and storing up an irregular surplus in such a manner that stoppage of the engine would not stop the light but only reduce it slightly, and that there would always be a good residue of two or three hours of full lighting power, or a supply of 8 or 10 hours of light for a diminished number of lamps. Sir William Thompson has constructed an instrument to make and break the circuit between Faure's battery and the dynamo, and thus fulfil automatically the conditions for the economical use of generating machines and the regulation of the supply of electricity for the lamps. The instrument also guards the coils of the dynamo from damage and prevents loss in the accumulator.

IS THE TELEPHONE A RECENT DISCOVERY?—The present discussion in our courts and elsewhere, in regard to the validity of the patent claim, assuming that Prof. Bell was the original discoverer of the fact that conversation may be carried on at a distance through the medium of an ordinary telegraph wire, may possibly be somewhat elucidated by the following extract from a published work on electrical subjects, printed in 1858, in which the writer speaks thus of the "telegraphone:" "The idea of using the earth circuit; the possibility of employing a single wire; any method of recording the magnetic current—in other words, of not only *making it speak*, but of reporting and preserving *its utterances*—all these were unknown elements, which it was left for the present generation to discover." The writer of the above certainly knew what he was talking about, and had discovered that electricity could be made to "speak" and "utter" vocal sounds. And this was in the year 1858!

CHROME STEEL ARMOR PLATES.—Experiments have been made at Gavres with armor plates made with chrome steel. The plates were of the compound variety; that is to say, they had a chrome steel front and solid backing of iron. The steel in such plates is intended to resist penetration, and the iron to prevent fracture. But the results at Gavres were not at all successful. The first projectile which hit the plate shattered it. It is thought that the union of the iron with the steel was not sufficiently intimate, and that the iron itself was not solid enough.

PRECIOUS METALS IN THE ARTS.—During the last fiscal year over $12,000,000 worth of gold and silver were used in the arts and manufactures in the United States. If gold were to be demonetized by the whole world it would still command nearly its present value for use in the arts.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Oct. 27.		Week Ending Nov. 3.		Week Ending Nov. 10.		Week Ending Nov. 17.	
Alpha	4.40	3.90	4	3.95	3.95	3.80	3.55	3.80
Alta	4.40	3.95	4.35	4	5	4	4.80	4
Andes	1.65	1.55	1.60	1.45	1.60	....	1.60	1
Alhion	2.30	2.05	2	2	2.40	1.55	2.40	1.85
Argenta	5c	....	10c	....	....	....	....	....
Addenda	10c	....	10c	5c	10c	....	10c	....
Belcher	2.10	1	2.85	2.80	3	2.85	3.35	3.05
Belmont	40c	....	60c	55c	60c	....	....	....
Best & Belcher	12	11	12	11	12	11	11	9
Bullion	1.90	65c	1.95	1.70	1.80	1.60	1.65	1
Bechtel	75c	50c	55c	50c	60c	50c	50c	....
Belle Isle	....	....	....	....	....	....	20c	....
Bodie	7	7	7	6	6	5	7	5
Benton	70c	65c	75c	65c	90c	70c	95c	75c
Bulwer	....	....	2.20	2	2	....	....	....
Boston	....	....	....	....	25c	....	25c	....
Black Hawk	....	....	....	....	....	....	10c	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	20c	....
Caledonia	25c	15c	45c	15c	40c	35c	35c	25c
California	90c	70c	80c	75c	75c	70c	75c	65c
Challenge	....	....	70c	....	85c	80c	70c	....
Chollar	2.40	2.05	2	2	2.15	2	2	1.70
Confidence	3	3	3.65	3.35	3.95	....	3.10	3
Con Imperial	25c	20c	20c	....	20c	....	20c	15c
Con Virginia	2.45	2	2.40	2	2.35	2.20	2.30	2.15
Crown Point	2.05	1.90	2	1.85	2	1.95	2.10	1
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	1	....	....	....	1	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	40c	....	....	....	....	....	20c	....
Derbec	....	....	....	....	....	....	....	....
Day	2	2.20	2.30	2	1.95	1.80	1.90	1.35
B. Mt. Diablo	20c	15c	40c	30c	35c	....	35c	30c
Eureka Con	16	15	18	16	17	16	17	16
Exchequer	1	1.35	1	1.35	1.40	1.35	1.40	1
Endowment	....	....	....	....	....	....	....	....
Grand Prize	5c	....	....	....	....	....	....	....
Golden Gate	....	....	....	....	....	....	2	2
Goodshaw	35c	30c	35c	30c	35c	....	50c	35c
Gould & Curry	7	6	7	6	6	6	6	5
Hale & Norcross	3.20	3	3.10	2.95	3.60	2.95	3.65	3
Head Center	....	....	30c	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	10c	....	....	....	....	....	15c	....
Julia	45c	40c	45c	40c	40c	30c	30c	....
Justice	95c	90c	1	95c	1.05	90c	1	85c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2	....	2	....	2	....	2	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	20c	15c	15c	....	20c	....	15c	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	1	....	1	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	2	....	2	....	2	....
Manhattan	....	....	1	....	1	1	2	....
Martin White	3.30	2.35	....	....	3	....	3	....
McClinton	....	....	....	....	....	....	....	....
Mono	2.20	1	1	1	2.35	1	2	2
Mexican	9	8	8	9	8	8	9	8
Mt. Diablo	5	5	7	6	6	6	5	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	20c	....	....	....	....	....	....	....
Noonday	55c	25c	50c	40c	40c	35c	35c	30c
New York	15c	1	10c	....	15c	10c	20c	....
Northern Belle	12	1	12	1	14	12	13	12
North Noonday	5c	....	25c	20c	10c	....	10c	....
Navajo	45c	....	40c	....	....	....	....	....
Occidental	1	1.30	1	1	1	1.10	1	1
Ophir	6	5	7	5	7	7	7	6
Original Keystone	....	....	....	....	....	....	....	....
Overman	2.65	1.95	2.60	2.30	2.65	2.40	2.90	2.45
Oro	40c	30c	35c	30c	35c	30c	35c	25c
Paris	....	....	....	....	....	....	....	....
Potosi	2.90	2	2.70	2.45	2	1.95	1.95	1.70
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	10c	....	10c	....
Savage	3.90	3.70	4	3.45	3.65	3.35	3	2.85
Seg Belcher	9	8	8	....	8	8	8	7
Sierra Nevada	15	13	14	14	15	13	14	11
Silver Hill	30c	25c	30c	25c	25c	20c	25c	15c
Silver King	19	18	20	19	19	....	19	....
Succor	....	....	....	....	....	....	....	....
Summit	10c	....	....	....	15c	10c	....	....
Scorpion	1.65	1.45	1.60	1	1.60	1	1	1 20
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	30c	20c	30c	25c
Tioga Con	20c	....	25c	20c	25c	20c	25c	....
Tiptop	5	....	5	5	5	....	5	....
Tuscarora	10c	....	....	....	....	....	....	....
Union Con	14	13	14	13	13	12	13	10
Utah	7	6	7	6	7	6	8	6
Ward	3	2	3	....	3	....	....	....
Wales	40c	....	50c	....	....	....	75c	....
Yellow Jacket	4.35	3	4.35	3.60	5	5	5	4.20

Sales at S. F. Stock Exchange.

Thursday A.M., Nov. 17.

50 Alpha 3
85 Alta 4
245 Andes ..... 1@1.30
170 B & Belcher 9
600 Bullion 1
275 Belcher ..... 3.10@3.05
320 Benton ..... 90@85c
70 California 85c
685 Con Virginia 2.15
109 Chollar ..... 1.70@1
730 Crown Point 1.80
770 Con Imperial 15c
50 Confidence ..... 3.10@3
350 Caledonia ..... 30@25c
120 Exchequer ..... 1.30@1
410 Gould & Curry 5
570 Hale & Nor ..... 3.05@3
280 Justice 85c
275 Mexican ..... 8@8
360 Ophir 6
650 Overman ..... 2.90@2.85
100 Occidental 1
250 Potosi ..... 1@1.70
1315 Savage ..... 2.90@2.95
1235 Sierra Nevada ..... 11@11
430 Scorpion 1.20
30 Utah ..... 7@7
640 Union ..... 10@10
820 Yellow Jacket ..... 4.20@4

AFTERNOON SESSION.

400 Alhion 2.10
550 Black Hawk ..... 5@10c
200 Bulwer 2
120 Bodie 5
125 Eureka Tunnel ..... 21@2.30
30 Eureka Con 17
200 Leeds 90c
10 M White 3
250 Mono 2
75 Mt Diablo 5
100 Manhattan 2
100 Navajo 40c
250 Noonday 40c
30 N Noonday 10c
250 Northern Belle 12
400 Oro 15c
100 Star 15c
50 Syndicate 40c
100 Tuscarora 15c

Bullion Shipments.

We quote shipments siuce our last, and shall he pleased to receive further reports:

Horn Silver, Nov. 10th, $22,500; Barbee & Walker, 10th, $1,374; Tintic, 10th, $2,520; Bullionville, 11th, $700; Hanauer, 11th, $4,660; Stormont, 11th, $3,140; Jay Gould, 11th, $3,610; Northern Belle, $5,866; Northern Belle, 9th, $5,-886 61; Star, 7th, $3,630.47; Day, 7th, $4,400; Bodie Tunnel, 10th, $2,577.16; Christy, 12th, $2,018; Standard Con., 15th, $37,945; Bodie Con., 15th, $6,232; Mack Morris, 12th, $5,223; Bullion of Paradise, 14th, $600; Winuemucca, 14th, $1,000; Syndicate, 5th, $5,934; Hanauer, 8th, $2,075; Mayflower, 9th, $3,825; Horn Silver, 9th, $15,000; Mammoth, 9th, $2,101; Barhee & Walker, 9th, $2,400; Horn Silver, 11th, $17,500; Horn Silver, 13th, $25,000; Wai Wera, 14th, $1,808,23; Christy, 15th, $2,141; Norwich, 14th, $3,470; Standard, 14th, $36,631.41.

TONITE.—In the largest and most important engineering enterprise now going forward in Great Britain, Tonite powder ie heing excluevely used, viz.: The Severn Tunnel, the Mersey Tunnel, the Hull and Barnsley Railway and the James Watt Dock, at Greenock.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scicntific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alexander M Co	Neavda	1	3 00 Oct 31	Dec 3	Dec 21	A B Cooper	328 Montgomery st
Betty O'Neal M Co	Nevada	2	25 Nov 14	Dec 19	Jan 5	R W Heath	318 Pine st
Belmont M Co	Nevada	30	15 Nov 11	Dec 19	Jan 18	J W Few	310 Pine st
Black Hawk G M Co	California	13	10 Nov 9	Dec 17	Jan 4	H A Charles	419 California st
Bonanza M Co	Nevada	1	15 Oct 31	Dec 3	Dec 20	J B Trendwell	404 California st
Bodie Tunnel & M Co	California	5	50 Oct 20	Nov 24	Dec 21	C C Harvey	304 California st
Belcher M Co	Nevada	28	1 00 Sept 29	Nov 1	Nov 24	J Crockett	327 Pine st
California M Co	Nevada	2	10 Oct 4	Nov 9	Nov 30	E F Stone	306 Pine st
Caledonia M Co	Nevada	27	25 Sept 29	Nov 2	Nov 22	R Wegener	
Grand Prize M Co	Nevada	7	25 Sept 30	Nov 1	Nov 21	E M Hall	327 Pine st
Hale & Norcross M Co	Nevada	71	50 Oct 6	Nov 9	Dec 1	J F Lightner	Montgomery st
Holmes M Co	Nevada	3	10 Nov 8	Dec 12	Jan 3	E A Holmes	318 Pine st
Lord of Lorn M Co	Nevada	2	10 Oct 8	Nov 17	Dec 19	R N Van Brunt	318 Pine st
Mexican M Co	Nevada	17	1 00 Oct 4	Nov 8	Nov 28	C L McCoy	309 Montgomery st
Mono M Co	California	14	1 00 Oct 4	Nov 9	Nov 29	W H Legat	309 Montgomery st
Morning Star M Co	Nevada	1	25 Oct 19	Nov 22	Dec 21	J B Moholm	331 Montgomery st
Mt Potosi M Co	Nevada	8	25 Oct 20	Nov 21	Dec 12	W J Taylor	330 Pine st
North Noonday M Co	California	4	25 Oct 26	Dec 1	Dec 23	W J Taylor	330 Pine st
Noonday M Co	California	4	25 Oct 26	Nov 23	Dec 20	W J Taylor	330 Pine st
Ophir M Co.	Nevada	40	1 00 Sept 30	Nov 3	Nov 23	C L McCoy	309 Montgomery st
Overman S M Co	Nevada	51	50 Oct 17	Nov 17	Dec 8	G D Edwards	414 California st
Potosi M Co	Nevada	7	50 Nov 11	Dec 14	Jan 4	W E Dean	309 Montgomery st
Quartz Mountain M Co	California	13	75 Oct 7	Nov 14	Dec 5	E Hestris	729 Montgomery st
Savage M Co	Nevada	48	50 Nov 3	Dec 6	Dec 27	E B Holmes	329 Montgomery st
Sierra Nev S M Co	Nevada	70	1 00 Oct 6	Nov 10	Nov 29	E L Parker	309 Montgomery st
Tuscarora M & M Co	Nevada	9	15 Oct 17	Nov 22	Dec 14	M E Sperling	309 California st
Utah S M Co	Nevada	36	2 00 Oct 13	Nov 16	Dec 6	G C Pratt	329 Montgomery st
Union Con S M Co	Nevada	18	1 00 Oct 10	Nov 14	Dec 5	J M Buffington	309 Montgomery st
Yellow Jacket S M Co	Nevada	42	1 00 Oct 4	Nov 9	Dec 6	N Otey	

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Buckeye M Co	California	4	50 Nov 10	Dec 19	Jan 19	W R Lowden	213 Sansome st
Belcher Con Co	California	12	25 Sept 22	Nov 21	Dec 9	G Y Hubbard	310 Pine st
Benton Coo Co	Nevada	6	25 Oct 14	Nov 18	Dec 8	W H Watson	302 Montgomery st
East Mt. Diablo	California	2	10 Sept 27	Oct 31	Nov 21	G W Fisher	324 Pine st
Franklin Gravel M Co	California	7	30 Oct 14	Nov 14	Dec 5	G R Spinney	310 Pine st
Goodshaw M Co	California	9	15 Oct 12	Nov 17	Dec 8	Chas C Harvey	309 Montgomery st
Golden Fleece Gr M Co	California	23	40 00 Oct 23	Nov 30	Dec 19	F Schinnier	785 Folsom st
Home G M Co	California	3	3 Oct 20	Dec 3	Dec 21	R Ellon	330 Pine st
Iowa M Co	Nevada	15	05 Nov 9	Dec 17	Jan 5	C C Leavett	414½ California st
May Flower Gr M Co	California	13	10 Oct 12	Nov 16	Dec 7	J Morizio	328 Montgomery st
Newcastle M. Co	California	2	02 Sept 23	Nov 15	Dec 5	E G Mathewa	318 Pine st
Rocky Point M Co	California	9	05 Oct 12	Nov 14	Dec 5	D M Kent	330 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Champion M Co	Ca'ifornia	B Burris	309 Montgomery st	Annual	Nov 23
Eintracht Gr M Co	California	H Kunz	209 Sansome st	Anuual	Dec 6
Kentuck M Co	Nevada	D O Stewart	234 Montgomery st	Annual	Nov 23
Maryland Con M Co	California	E P Farnsworth	216 Sansome st	Aonual	Nov 25

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	California	W Letts Oliver		20	Nov 19
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Sept 27
Father De Smet M Co	Dakota	H Dean	New York	50	Oct 15
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Nov 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Nov 15
Silver King M Co	Arizoua	J Nash	315 California st	25	Nov 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Nov 12
Tip Top M Co	Arizona	H Deas	309 Montgomery st	20	Aug 25
Western M Co	California	O S Curtiss	309 Mo ntgomery st	75	Nov 10

The Mining Share Market.

The mining share market continues very weak indeed. A long drag of dullness and low pricee in the Comstock market, such ae hae been undergone for several weeks, almost invariably culminates in a sharp decline, which is alarming to the average holder. People become uneasy and frightened at the staleness of speculation, and imagine things which really do not exist. Finally, a numher of them throw their stocks on the market, and bring about the very disaster in which they stood in dread.

A survey of the drift leading from the Chollar-Norcross-Savage shaft has heen made which shows that it hae further to go to connect with the main incline than was at first supposed. It was thought that the distance was 160 ft., but the survey ehows the distance was 193 ft. They have run 78 ft. of this distance, leaving 115 yet to go. The rock is of a deep hlack color and so hard that it will ecratch glass as readily as a piece of jasper or agate, yet they are making excellent progrese in it. This rock ie undonbtedly the same hard helt that was cut east of the vein nearer the surface in running the old Gould & Curry lower tunnel. It presents the same appearance and characteristics in every respect.

The hlowers now deliver a eupply of air at the face of the drift sufficient to allow of the men working quite comfortably. The taking out of the hulkhead between the Chollar-Norcross-Savage ehaft and the Hale and Norcross has also materially contrihuted toward the cooling off of the 2400 level.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Pay-Day G. & M. Co., Nov. 12th. Locatiou: Arizoua and New Mexico. Capital atock, $10,000,000. Directors—R. H. Lloyd, John Shirley, John A. Drinkhouse, Joseph Brandenatein and Tbomas J. Cluuie.

Monumental Tunnel & M. Co., Nov. 12th. Location: Eureka county, Nevada. Capital stock, $10,000,000. Directors—L. L. Robiuson, W. S. Wood, W. M. Stewart, E. N. Robinsou and Henry Pichoir.

San Francisco Carmaker's Protective Society, Nov. 14th. There is no capital st ock, and the Directors are William Beck, Albert Johnson, Milton Brodie, James Neil, Jr., and Luther Hendry.

Mexico Cold Placer M. Co., Nov. 16th. Location: State of Sinaloa, Mexico. Capital stock, $100,000. Directors—A. D. Allen, Edward Norton, C. L. Pidwell, James H. Cates and David Buck, all of San Francisco.

Little Chief M. Co., Nov. 16th. Location: Magnolia district, Butte county, Cal. Capital stock, $80,000, in 800 shares. Directors—T. Schumacher, A. L. Collina, S. C. Deau, George S. Clark, E. B. Deau of San Francisco.

IT is now pretty well known what portion of the area of the mining ground of the western slope of the Sierra Nevada mountains will he displaced and sent down stream in carrying on hydraulic miuing. The dirt to he used that way can he measured or even approximately weighed in pounds of avoirdupois.

Artesian Well Tubes.

The principal difficulty in the ordiuary mode of sinking and tuhing arteeian wells is to forcs the pipe in tuhing in uniform size down to any conoiderable depth, owing to the lateral pressure of the surrounding earth, and the usual result is, at a depth of from 100 to 200 ft., the lateral pressure ie so great that the pipe cannot he moved down with all the force availahle. Tho only alteruative is to put down a smaller pipe inside of the first, and repeat the same as often as the pipe gete stuck fast, and hy that mode, if the well should reach a dopth of 507 or 600 ft., it would he of little practical value, as the diameter of the pipe at the hottom would he so small.

B. R. Norton, of Alameda, has obtained a patent through the MINING AND SCIENTIFIC PRESS Patent Agency for an improvement which ie deeigned to overcome this obstacle. By his improved method he makes the well tuhing conical and inclined ahout two or three inches to the 100 ft., with the large end at the hottom, hy which means he not only avoids the difficulty of getting the pipe etuck fast and held hy the lateral pressure of the surrouuding earth, hut utilizes the latsral pressure in forcing the pipe down—very little force more than the weight of the pipe and the lateral pressure—where the earth ie excavated inside and underneath the pipe.

A well say of 1,000 ft. would he started with pipe 30 iuches in diameter, and inclined two inches to the 100 ft., it would terminate at the top with pipe 10 inches diameter, which practically would he eqnal iu value to a well 30 inches in diameter the entire depth, and would cost less; and further, it would he impossihle to sink a well 100 ft. of 30 inches diameter of uniform siss pipe. A well constructed with conical pipe as proposed, would he like receiving the water into the large end of the funnel instead of the small end, as hy the old mode.

The boring or excavating of the well for the conical pipe can he done hy hand or steam power, and with any of the well-known tools. The inventor prefers sand pumps constructed of half-inch boiler plate, armed on the hottom with heavy barhed irons for picking or loosening tho earth or rock, the whole weighing 500 or 600 lbs., and worked by a rope attached to a hoisting engine, alternately hoisting and letting it drop eight or ten ft., which would loosen the earth and fill the sand pump with the loosened material. The eand pump would he constantly changed in position, so that it would not etrike in the same place, and spring tools would he used to cut away the earth from under the edge of the pipe.

Each inner section extends about half way into the outside section helow, and is secured to it. The upper end projects out, so that the next section above slopes over it. The inner pipes all abnt, so that the tuhe ie douhle throughout its whole length, and has the strength of hoth tuhes.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

WORK.—Monitor *Argus*, Nov. 14: Work is progressing on the Polaris and North Colorado mines in the Monitor mining district. Our mines are looking up, and no doubt there will be some facts as to the buried wealth of this region laid bare creanother year shall roll by, that will open the eyes of the mining world to the great opportunities they have perhaps lost. The owners of the Alpine placer claim, which is situated just below Hangman bridge, are hauling lumber aod preparing to commence operations at that place in a short time.

AMADOR.

MORGAN'S TUNNEL.—Amador *Ledger*, Nov. 12: A considerable body of ore has been encountered in the tunneling operations at Murphy's ridge. In one spot the ledge was 3 ft thick, and is said to range from this thickness down to 8 inches. The ore is full of sulphurets, but no free gold is visible to the naked eye. There is no question, however, that it is fair paying rock.

MISCELLANEOUS.—Mining at the Amador Gravel claim has not yet been recommenced, although everything seems to be in readiness for work.

DOWNS.—Amador *Sentinel*, Nov. 9: Work has been resumed at the Downs mine. Their full force of men is not at work yet on account of the scarcity of water to drive the mill. Sinking in the Golden Gate shaft is near completion; the ledge still holds its richness and size. Very little news from the Pioneer district. The Acme mining company, under the superintendency of Mr. D. B. Kelly is working on its new quartz mill.

CALAVERAS.

COMMENCED WORK.—*Chronicle*, Nov. 12: The water supply has so far increased sufficiently to enable some of the hydraulic claims in this vicinity to commence work. Preparations for the winter's run are being made in all, and in some everything is in readiness to go ahead. Operations have commenced in the Mammoth hydraulic claim on Tunnel Ridge, and it will not be long now before all the claims on the Ridge will be in active operation.

ARASTRA.—*Mountain Echo*, Nov. 9: Robert Leeper has completely renovated his arastra mill and is now ready for crushing. Considerable improvement is going on in Angels, and things begin to look encouraging. Bennett & Co. are still at work on the Raspberry mine. The ore is looking well. Several clean-ups have recently been made from the mine, none of which has paid less than $15 per ton, and at a depth of 20 ft the vein is over 5 ft in width.

EL DORADO.

NEW GRAVEL MILL.—*Mountain Democrat*, Nov. 12: Nelson Dunn has completed his contract on the 10-stamp gravel mill for the Highville mine, Newtown, and it will be started up for trial to-day, and probably for permanent operations next Monday or Tuesday.

A FINE MINE IDLE.—A short distance southwest of the celebrated Springfield mine, near the Cosumnes river and the Amador county line, is the Montezuma mine, owned O. P. Harland M. G. Griffith. On the surface, in the "early days," a number of Spaniards gouged into the seams here the quartz thus extracted on their heads down to an arrastra near the creek, and realized big wages in crushing and washing it. In this way they and their successors, out of a cut 12 to 15 ft wide and not more than 100 ft long, took out several thousand dollars. The traditions relating to their success led other parties many years later to explore the underlying ledge, and the location of the Montezuma, which is a strong ledge, varying from 3½ to 8 ft in width, with well-defined walls and a fine gouge. A shaft was sunk, a tunnel run, and there was a "spurt" of high-pressure mining. The quartz, however, so far as they worked it, yielded from $15 to $80 per ton. Mr. Hart, an old resident of the vicinity, entered into copartnership with Mr. Griffith, and they put up a 10-stamp mill, run by water power, but when they had run it a short time, and had realized about enough to put hoisting works and other needed machinery, the dam at the head of their ditch was washed away, and in putting in a new one that might be relied on to resist future floods they exhausted the means realized from their previous workings, and now the mill stands idle, with a splendid water-power running to waste, until they can get their affairs into such shape as to put up the machinery that is necessary to the proper working of the mine.

RICH SPECIMENS.—Placer *Argus*, Nov. 12: A party of four men who have been prospecting on the El Dorado side of the river, came into town last Saturday with some $2,000 worth of specimens, which they found near the top of the hill. They had, during the preceding two or three weeks, obtained several hundred dollars in the same vicinity. They say they have struck a quartz ledge 6 inches wide.

INYO.

PANAMINT.—Inyo *Independent*, Nov. 12: Superintendent Purdy, of the Inyo consolidated mining company, is now engaged in extracting ore from the Little Chief, Wyoming, Eureka and Independence mines. The company have a number of other good paying mines, but have not the men at present to work them all. As soon as the company's stores arrive from San Francisco, 150 men, including chloriders, and others will be employed. There is now at the mill about 500 tons of fine ore, which will be worked as soon as some little repairs are completed on the mill. Pack trains are busy getting in wood, and ore is being delivered at the mill by tramway. As soon as repairs are completed, a long and profitable run will no doubt be made, which will enable the company to materially increase their dividends.

LOOKOUT.—Preparations are being made to start up the Modoc furnaces during the coming week, under the general management of Frank Fitzgerald. J. J. Williams, formerly superintendent of the New Coso, will take charge of the furnaces during the run. About 200 tons of ore from the Minnietta and Modock mines are now on the ground. Al. Robinson's mule train is packing 15 tons of rich ore from Panamint, in addition 100 tons of fine dust will be put through. The run will produce about 100 tons of bullion, which will be shipped during the present month.

NEW WORK.—A letter from Cerro Gordo says that several men have been put to work on the old Union mine, Capt. Keller has put some men at work on Ygnacio Hill, at Cerro Gordo.

LOOKING UP.—The prospects at the southern end of the county are decidedly brightening. Panamint, Lookout and Darwin will all be producing bullion in a few days.

KERN.

THE NEW SILVER MINING DISTRICT.—Kern County *Californian*, Nov. 12: We have been shown a quantity of specimens of the ore from the new silver district recently found, that we have before alluded to, on the north side of Erskino creek, about 2½ miles from Hot Springs. It appears to be free milling ore, and the samples indicate that the pay streaks are enormously rich. Seven leads have been found and the principal one has been traced a mile, showing equally well in every part. A gentleman familiar with silver mines, who examined them, states that the prospect is splendid, and if it had been found anywhere within 50 miles of the Comstock an old fashioned mining excitement would have been the result.

MARIPOSA.

SILVER DISTRICT.—Mariposa *Gazette*, Nov. 12: We were called upon on Tuesday last by Mr. Morse May, of Modesto, who is engaged in opening a vein lode of silver ore, running parallel about half a mile west of the mine

and works of the Modesto Silver mining company. At his point Mr. May located a vein and claim of 1500 ft, upon which he has sunk a shaft 50 ft deep, and shows a vein 2 ft thick, between well defined walls 4 ft apart. The vein at the bottom of the shaft indicates an increasing width as it goes down. But one test as yet has been made of the ore, which assayed $27 per ton. A contract has been made to sink the shaft another 50 ft, which is expected to be done by Christmas. This is certainly a promising outlook for the Silver District, which is quite contiguous to our town.

THE MODESTO SILVER MINE.—Mr. Moses May, of Modesto, who is operating in the same mining district, informs us that Mr. C. F. Leavensworth, the lessee of the mine and works is progressing rapidly with his work, in constructing machinery upon the mine. Nearly all the machinery of the 10-stamp mill is upon the ground, and the hoisting works will be completed and ready for use in 6 or 8 days. Mr. Leavensworth has a full force of assistants for present purposes.

MONO.

BODIE.—*Free Press*, Nov. 15: There are 3 points of interest on the mineral belt of this district, and as time passes the interest in them increases. We have reference to the Standard, Lent and Red Cloud shafts. The three companies that control these properties are the ones who will determine whether or not the rich veins found near the surface extend to great depth—1200, 1500 or 2000 ft beneath the surface. Quartz mining is always an uncertain business, as indications are often deceptive and men are led astray by formations altogether kindly. No one for a moment doubts but that Bodie district has more than passing merit, and if there is anything whatever in "indications," the camp has yet to see its best days. The Standard shaft is down 1100 ft, and it will oo sunk to still greater depth. The management is satisfied that the development unde below this point will overshadow the upper levels. The Lent shaft has reached the depth of 800 ft, and they will soon commence crosscutting from that level. The Red Cloud shaft is being driven down, and it is now at a point 649 ft below the surface, with a slight increase of water. The future workings of these three large shafts will bo watched with interest. Now that the railroad is completed timbers and wood for the mines will commence to come at a lively rate. The Standard will be the first to be supplied, and the balance will be served in their turn. This is an important work. There need be no delays in the mines on account of a lack of material, for the railroad trains will go and come throughout the winter. There is no change to note in the other mines, as the review will prove. The outlook for the winter here is good—better than in most of the mining districts, and capitalists are confident that in a few months matters will be much brighter than at present.

NEVADA.

CENTENNIAL MINE.—*Transcript*, Nov. 13: The shaft of the Centennial mine is being sunk from the 4th to the 5th level. The levels will be 120 ft apart, and 30 ft of the distance has been sunk, and a ledge of fine ore is presented in the shaft. With the opening of the 5th level a large amount of rich ore will be accessible in the backs above, and will go to something like the old figures of from $80 to $100 per load.

QUARTZ LEDGE.—North San Juan *Times*, Nov. 12: About a year ago a quartz ledge was discovered on Buckeye Hill, within the boundaries of the placer claim then owned by George D. McLean, which, if all accounts be true, and we do not doubt them, will prove a bonanza to the owners. A tunnel was run from Sweetland creek, which has tapped the ledge about 20 ft below the surface, at which point the ledge was nearly 2½ ft wide. Mr. Powers took to Virginia City a quantity of rock which assayed from $8 to $16 per ton. The white rock, which apparently contained neither gold or silver, assayed $8 to the ton, while the blue rock assayed $16 and over to the ton. The original locators have consolidated their claims and are preparing to run another tunnel to the ledge, which will tap it over 100 ft below the surface. They have great confidence in the ledge.

GRAVEL MINE LEASED.—James E. Broderick has leased his valuable gravel claim at Little Grass Valley, to some French Corral Chinamen for a term of 6 years. It will be worked by the hydraulic process and a bedrock tunnel will be run immediately. The Grangers cannot interfere with this mine, as it has a dumping place independent of the Yuba.

MINERS ENJOINING MINERS.—Mrs. Hawk owns a gravel claim in the bed of a stream into which the tailings from the Hirschman hydraulic mines flow, and her son James says she will when the proper time comes, sue for an injunction to restrain the Hirschman company from covering up her mine with slickens. This is the best joke yet.

PLACER.

IOWA HILL.—Placer *Herald*, Nov. 12: J. B. Hobson, of Iowa Hill, favored us with a call while in Auburn this last week. While some of the hydraulic miners in that district are holding back owing to the slickens agitation, a majority of them have got, or are getting, their mines in order for active operations this winter. The drift mining outlook on the Iowa Hill divide is very encouraging. Many comparatively new locations have been made for over 20 miles up the ridge on what is believed to be the line of the extensive blue gravel channel, in which the Damascus or Mountain Gate Co. is operating. Gay has been struck in Greek claim and in the North Bassel, both believed to embrace portions of this same blue channel. The Giant Gap claim, a short distance above Iowa Hill, on which work has been prosecuted for years, and much money expended, has at last broke through the rim into the gravel, and has every prospect now of soon being ranked among the rich paying mines of that region. Quite a number of other claims, both gravel and quartz, are driving ahead their prospecting work, so that altogether the condition of the Iowa Hill divide is more than fair and its outlook particularly hopeful. Take away the stagnating effect of the debris agitation and that section of our county would be far more prosperous, and the scene of much more activity than has characterized it for many years.

THE RISING SUN MINE.—Colfax, last week end, was in quite a flurry over certain changes in the management of the Rising Sun mine. It is true that Supt. Werry resigned his charge of the mine, but other rumors to the effect that the men could get no pay we believe were not well founded, as it was the intention to pay up last Sunday. Why there should be any trouble is not easily understood, as our information, which comes quite direct, is to the effect that the mine made an exceptionally good run last month, and has fine prospects ahead.

PLUMAS.

ELIZABETHTOWN.—Plumas *National*, Nov. 12: No new developments in the Manson & Corbin claims this week, but the prospects continue flattering. The east drift from the lower shaft proves that the pay channel in the flat is over 100 ft in width, and the west drift shows good indications, and rich pay will probably be found in a day or two. The upper works are paying well, as usual, and the whole outlook is favorable. The work at the lower shaft has proved the channel much larger than the owners expected, and there is now no doubt but that it is extensive and valuable.

BROKEN DOWN AGAIN.—The boring machine in the shaft being put down by Mr. Mills, opposite town, came to a stand-still on Thursday, the auger being down about 07 ft. A few days ago the drill struck a rock, and some difficulty was experienced it getting past it. It is thought that the steel hand on the bottom of the pipe or tubing was broken, and since that time the lower end of the pipe has closed up until the tools will not work through it. This will make some delay, and probably make it necessary to sink another hole. The borer has so far been in fine looking, solid gravel, and should the big working shaft be pushed down, it is thought that no trouble will be experienced after the first 20 ft.

MONTE CURISTO.—Messrs. Smith and Parsons were in town on Tuesday and Wednesday, and from them we learn that operations are going on swimmingly up at the Peak. The snow fell during the late storm to the depth of about a foot, but has nearly all gone from the southern slope of the hills. Work is going along steadily, the main tunnel being now in some 2,500 ft, and progressing at the rate of 5 ft per day. The gravel in the face of the tunnel is improving in depth and quality in the last hundred ft, and but few large bowlders are now met with. The managers are much pleased with the indications, and think the outlook very flattering. Improvements are constantly being made. The work of sinking and raising an air shaft is being pushed as rapidly as possible, and it will soon be completed. A new boiler has been placed in the machine shop, of much larger size and capacity than the old one. The supplies for the winter have been received, and give some idea of the magnitude of the work. Probably 600 cords of wood are stacked up. In the storehouse is 20 tons of flour, 8 tons of vegetables, thirty hundred of butter, thirty hundred of beans, and everything else in proportion. The pay roll now shows about 40 names, but of course this is likely to be increased considerably at any time. Our informants seem to be in splendid spirits over the prospects of the Monte Cristo, and confidently look for grand success this winter.

SIERRA.

EXTENSION.—*Mountain Messenger*, Nov. 12: The Extension Co., has got a mule at work in its claims. The yield this week up to Wednesday noon was 34 ounces.

ANOTHER uptnise is being made in the Ruby tunnel at Caribou ravine.

ABOUT 300 cords of wood have been laid in at the Brush Creek mine, and work will be continued during the winter.

RAPID WORK.—About 50 men are at work on the quartz mill at Loganville. They will have it done before snow flies, probably.

TRINITY.

TRINITY CENTER.—*Journal*, Nov. 12: Several new houses have of late been put up in and about the Center and others are in contemplation. Johnny Coyle lately bought out his partner and is fitting up his claim in good shape. Powell & Carter, just above Coyle, have struck it rich, and in the adjoining claim below prospecting is being pushed with promises of soon striking it.

NEVADA.

WASHOE DISTRICT.

CALIFORNIA.—*Enterprise*, Nov. 12: Are still opening out and repairing the drifts and winzes connecting with the old Con Virginia shaft. On the 2500 level the joint California and Con. Virginia winze has been sunk and timbered 5 ft, and are now putting in chairs.

UTAH.—Have completed work on the station and rock chutes and are cutting out a station for a blower. The east drift is extended 12 ft.

SIERRA NEVADA.—On the 2500 level cast crosscut No. 3 has been extended 50 ft, and No 5 was extended 27 ft. The east drill hole was advanced 155 ft. The main north drift was extended 30 ft.

UNION.—Are retimbering on the 1600 level in the drift connecting with the Sutro tunnel; are easing timbers on the 2000, and cutting out a bob-pit at the 2000 station.

UNION CON.—Are cutting out a station at the 2700 level of the joint Mexican east winze. The joint Sierra Nevada west drift has been extended 24 ft; the joint east drift has been advanced about 20 ft.

MEXICAN.—Are cutting out a station at the 2700 level of the joint Union Con. winze.

OPHIR.—Have completed the new line of compressed air pipe in the main lateral drift. The joint Californian cast drift has been extended 26 ft.

CON. VIRGINIA.—Are still opening out and repairing drifts and winzes connecting with the old Con. Virginia shaft.

YELLOW JACKET.—On the 3000 level the south lateral drift was run 27 ft, making the present length 147 ft from the switch. During the week we have timbered the whole length of the drift. The east cross drift is out 149 ft from the same switch, having been advanced 47 ft. The quantity of water pumped continues the same—58 miners' inches.

SUTRO TUNNEL CO.—The main tunnel repair men have placed in position 60 sets of new timbers in different parts of the tunnel, removed 70 sets of old timbers, besides repairing the track, clearing up loose dirt, removing rubbish, etc. Flow of water, 5,376,681 gallons.

BRISTOL DISTRICT.

MAYFLOWER MINE.—Piocbe *Record*, Nov. 11: Prodigious accounts are given as to the development of the large and exceedingly rich ore body in this valuable mine. As work progresses on the bonanza the bigger it grows, and the deeper it is sunk on the richer the ore proves to be. The mill of the company—a 10-stamper—let its stamps drop again last Sunday, and it is expected to clean up for the month of November somewhere between $60,000 and $90,000 worth of bullion. During the week, while in Bristol, Dr. Nichols picked from the teams hauling ore to the mill what he considered average samples and had them assayed, giving the following results: $537 24, $025 48, $223.00, $515 24, $225.21, $1,124 75, $653 47, $560.-68, $345.40. A fair showing.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, Nov 9: Since the last report a very encouraging strike has been made in the fourth shaft level. The development is in the west drift, and further in that direction than anything yet found in the shaft levels above. At present the ore shows a width of from 2½ to 3 ft, assaying from $60 to $310 per ton, most of the assay going over $100. This development is very promising, looking grandly, but sufficient work has not yet been done to determine its extent. The other shaft levels present the same appearance as at time of last report. The adit and levels above have shown no very material change during the week, though there is some improvement in the 9th. A few days since a change occurred in the formation on the 7th level, directly over the body of ore found on the 9th level, which looks promising to open into ore. There are being extracted and sent to the mills about 80½ tons of ore per day. Bullion shipments on Sunday will amount to $107,467.

MOUNT DIABLO.—The north crosscut from the bottom of the east drift, from the bottom of winze, No. 1, has advanced 7 ft into a ledge of low grade quartz ore, assaying from $20 to $26 per ton. The north crosscut from winze No. 3 is 85 ft in length; the face has shown small spots of ore for a few days past. In the intermediate level, below the third level, and between that and the bottom of winze No. 2, a ledge of good ore has been struck which assays $77. The north crosscut from the third level, and just above this body of ore, is also yielding considerable ore of a similar grade. The east drift has advanced 15 ft, and is in favorable ground. The winze from the east drift on the second level is down 40 ft; the stope from the west drift is up 32 ft. The winze in the gulch has attained a depth of 104 ft.

ESMERALDA DISTRICT.

A MILL AT LAST.—*Herald*, Nov. 9: There is no guesswork about it, for it is a settled fact—the Cortez mining company have a splendid piece of property and are going to build a mill. J. B. Hiskey has surveyed the mill site and set the stakes. The company have purchased the springs on Mt. Brady from S. G. Cobb and W. J. Vernon, and Mr. Hiskey the first of the week made a survey of the line of ditch from the springs to the mine and mill. The distance the water will have to be brought is 3¾ miles. It is estimated that at least 4 inches of water can be obtained at the dryest season of the year. The mill is to be built within a few ft of the mouth of the lower tunnel, and the cars from the mine will dump the ore right into the self-feeders. The mill will be a 20 stamp one, and Superintendent Wells informs us that it will be crushing ore by the first of June next. He went below Thursday to purchase supplies for the mine for the winter, also to contract for lumber for the mill and look at the latest improved machinery. Work is being pushed at the mine. The tunnel has been driven 30 ft this week, and the incline will be finished to a point on a level with the lower tunnel some time next week. The indications in the incline are favorable for a large body of ore on that level. The developments already made in the mine guarantee, at the lowest possible estimate, 60,000 tons of ore, and there is now on the dump 750 tons, taken out merely in running incline and drifts, that will mill from $150 to $200. This is a good starter for a 20 stamp mill and the boom that will strike our camp at an early day. The coal house is finished and J. F. Parker is hauling in 1,000 bushels of coal for winter use.

EUREKA DISTRICT.

PROSPECT MOUNTAIN TUNNEL.—*Sentinel*, Nov. 11: The *Sentinel* was informed yesterday that the whole face of the Prospect mountain tunnel is in a formation which, if not ore, is the very next thing to it. Bunches and seams of good ore have been encountered for the last 20 ft, and at last accounts the contractors were expecting with every blast to break through into a regular bonanza. The writer has thought that the tunnel would have to be run some 300 or 400 ft further to reach the main mineral zone, just west of the summit of the mountain, but in conversation the other day with a mining man who is entirely familiar with every inch of the ground, we were informed that there is a bend or swell in the lime belt, which carries it considerably down the hill in the direction of the tunnel. This being the case, the public need not be surprised to learn of an important strike in the west side tunnel at almost any moment. They are bound to strike it ultimately, and the only question is one of distance. The elbow in the line spoken of will hasten the discovery.

GOLD PARK DISTRCT.

REVIVINO.—Cor. Grantsville *Bonanza*, Nov. 12: Gold Park district is now attracting considerable attention and will soon come to the front as a producer of bullion. The town is located in a beautiful basin, nearly in the center of which is the Shoshone range of mountains, 35 miles from Grantsville, and about the same distance from Austin. This district was formed several years ago, and a number of mines located which were abandoned about a year after by the locators. Mr. Frank Bradley and others about 2 years ago relocated these mines, and after prospecting and working on some four locations about one year, bonded them to Messrs. Cooper and San Pedro, who are now the lucky owners, and who are at present actively engaged in developing two of them—the Arctic and Star of the West. The Arctic is a well defined vein, averaging 4 ft in thickness, carrying about $40 in gold and $20 in silver per ton. The Star of the West is not as large, will average about two and one-half ft, and the ore will mill $100 per ton in gold just as it is extracted, without any assorting. The company have commenced grading the ground for the mill, the material of which will commence to arrive in a few days. It is the intention of the owners to have the mill up and running by the middle of January, when the mines will speak for themselves.

KINGSTON DISTRICT.

OPERATIONS.—Eureka *Sentinel*, Nov. 15: D. O. Mahony, returned Saturday night from Kingston district, 30 miles south of Austin. The Victorine M. & M. Co. is carrying on extensive operations at that place. A 30-stamp mill and 2 O'Hara furnaces are in course of construction. The mine is rich in gold, the ore going from $40 to $1 000 to the ton. There is plenty of ore in sight. Seventy-five miners have been employed, and all of the stopes are filled with ore. The ore accumulated so fast that 50 of the 75 miners had to be dropped last week. Sweeney & Co. of Eureka, have three large quartz teams on the ground and the hauling of ore from the mine to the mill, a distance of two miles, was to have commenced yesterday. Large stables, etc., have been put up to accommodate the teams. The mill and one of the furnaces will soon be ready for business. The O'Hara furnace is something new in this State. Gasoline is extensively used in this process. S. B. Mowery, formerly superintendent of the Lemon mill at this place, has the contract for building the furnace. Kingston bids fair to become a prominent mining camp.

LEWIS DISTRICT.

DEVELOPMENT.—As the work of development proceeds the mines continue to improve, and the outlook for the permanency of the camp was never so good. New and important strikes are being made every few days. With the near approach of the end of the year, the numerous claim owners hestir themselves, and shouldering the ever-handy pick and shovel, wend their way to the promising prospect, there to do the necessary amount of work to hold what some day may astonish the country with its richness. New prospects will be discovered and located while this work is going on, and when spring arrives Lewis mining district will exp rience such a boom as has never been experienced since the days of White Pine. The mines are there. All that is needed is development, and that is going ahead as fast as money can send it. The Sunbeam, lately bonded by A. D. Couter, shows what development will do for a mere prospect hole. A short time ago it was simply a good looking and promising prospect. To-day it is one of the best claims in the district, and this with but a month's good work. Another instance is that of the G. W. Bothwell mine, recently located by L. B. Ball and Thos. Morgan. It was discovered by the opening of the railroad grade, a short distance from Middle Town. Although not opened up very much it already shows its worth. Ore from the grass roots assays $84 to the ton, and the promise of its developing into a splendid mine is excellent. The owners intend to put in a tunnel and open the mine in good shape.

SAFFORD DISTRICT.

ENCOURAGING.—*Silver State*, Nov. 15: Encouraging reports are received from Safford district. The Ouondaga mine is said to be producing ore that assays $300 per ton. The shaft on the Contention is down 65 ft, with a foot of ore in the bottom that assays $500 per ton.

ARIZONA.

SILVER DISTRICT.—Arizona *Sentinel*, Nov. 12: Work on a large scale is about commenced on the Amelia mine. This property, a short time since, was sold by Col. Coker to a Boston syndicate. They have a good ledge, and all that is wanted is development. Dr. F. W. Seward has returned from New York. Our affable friend is the representative of the Mendivil and Clip M. Co. He thinks of erecting a good custom mill at Norton's landing. The doctor is a thorough business man, and whatever he undertakes will be successful. Jose Seres, one of the first prospectors of Silver district, is in Yuma. Joe is enthusiastic in his praise of the ledges of this camp, especially the Black Rock mine, on which he has worked for some time past. Mr. Geo. Feick was in town this week. He reports everything prospering at Silent. Col. Frank Riggs, a prominent mining operator, will visit Silver district this week under the guidance of Mr. A. H. Cargill, of the Silver Glance mine.

BISBEE NOTES.—Tombstone *Epitaph*, Nov. 7: From Mr. J. C. Tappiner, who is developing some very promising mines in the great copper camp, it is learned that the Neptune Co. have commenced again to work the Uncle Sam mine, and have made a rich strike of carbonate of copper. This new find is about 200 ft northward from the old workings. The Atlanta has a tunnel running westerly, about 14 ft in length, in lime and oxide of iron, with a fair showing of striking ore soon. The new shaft of the Golden Gate is down 20 ft in fine carbonate and azurite of copper. It has improved steadily from the top down, and is looked upon as a good prospect. The Watsou mine is being worked, and turning out some fine silver ore. The Baton Rouge is down about 50 ft on an incline, and strikes occasional bunches of copper glance and sulphate of copper. It has two good walls, about 6 ft apart. From the foregoing it would seem that Bisbee is looking up, and will soon have other productive mines besides the Copper Queen.

SILVER BELT BULLION.—Arizona *Miner*, Nov. 11: The last run of the Silver Belt ore, made with the little furnace at the Agua Fria, during the month of October, amounted the nice sum of $24,000. This we consider good, when taken into consideration the diminutive size of the smelter and the annoyance of getting teams to haul coal with which to keep the furnace in blast. The Belt mine is, and has been, the best paying property in Yavapai county. To-day, at a depth of nearly 400 ft, the ledge matter is larger and richer than on the surface, hence we may claim for this property a permanency equal to the best prospected ledges in the country. Mr. Thorne, one of the owers, deserves especial credit for the manner in which he has clung to this property and worked it without aid from capitalists, but entirely upon the merits of the property itself. Tombstone, nor any other mining camp cannot boast of a mine superior to the Belt, of Yavapai. The smelter will continue in operation, and every day adds to the fame of the property.

GLOBE DISTRICT.—Cor. *Citizen*, Nov. 13: Peace and prosperity prevail here, and everybody appears to be encouraged and happy over the promising outlook for the future. The streets are thronged with people, all of whom seem busily engaged in every class of business. And the sidewalks are packed with new goods of every variety, and which continue to arrive daily by the tons. The machinery for the furnace of the Buffalo M. Co arrived on the ground yesterday and will be in place and ready for active operations in a very few days. The first shipment of bullion was made yesterday from the Miami mill. The number of ounces was not stamped on the bar, but it looked to be about $1,500, which is the first yield of Emeline ore to its present owners. From what we can learn the mine looks splendid and will be a constant producer of bullion from the present time hence. It is reported this morning that the 500 level in the Mack Morris mine has been reached and struck a vein of ore 22 inches wide of black sulphurets, that will run way up into the thousands of dollars per ton. The success of the Mack Morris mining enterprise is due absolutely to the experienced and intelligent management, without which there would have been ruin and failure long ago.

COLORADO.

PITKIN.—*Register-Call*, Nov. 11: Between 30 and 40 mines will be worked during the winter in the Pitkin district. Cummings & Flinn's smelter at Leadville, received a trifle over 500 tons of ore from the Adelaide mine during the month of October. The Evening Star and Morning Star since their consolidation have opened up splendidly. The output of the mines for the month of October was 2,600 tons, which brought an average of $40 per ton aggregating the handsome sum of $104,000.

DIAMOND.—The Diamond tunnel, near Georgetown, was driven 28 ft during the month of October, which made the tunnel on the 31st day of that month 1,756½ ft long, of 8 or 10 ft. A raise extends from the tunnel to the surface. They are stoping near the surface, where the vein is narrow, but it is a good one for its size. The ore will mill way up. A crushing will be put through the Gold Hill mill about Christmas. Allen & Oickinson have 8 or 10 men employed in the Yellow Jacket, half a mile northeast of the Gold Hill. They are taking out ore. One hundred tons are now on the dump. A tunnel has been run along the vein a distance of 200 ft, and 2 raises have been run up—1, 120 ft, reaches the surface, and the other has been carried up 130 ft, and is within a few ft of the surface. A connection has been made between the 2 raises, which are 30 ft apart. Good ore is being stoped out. A crushing will soon be made in the Gold Hill mill.

VIENNA MINES.—*Wood River Miner*, Nov. 13: We interviewed Chris. J. Johnson, who arrived from Vienna, in the Sawtooth country last week. He gave us some data from Smiley district. Mr. Johnson is stockholder in two companies, one organized at Winona, Minn., and the other at LaCross, Wis., and he is also superintendent of their mines. These companies own the Vienna, Mountain King, Hidden Treasure group, Alturas, Justice, Webfoot Oregon and others. These mines are located on the Sawtooth range, near the head of Smiley creek, about 90 miles northwest of Haley. Of these properties the Vienna is the best developed. Three tunnels show up this homanza. The first is in 190 ft, tapping the vein 150 ft from the surface; tunnel No. 2, 100 ft below, is run in on the vein 223 ft; tunnel No. 3, also on the vein, and 90 ft below No. 2, is in a distance of 300 ft; so any one can see that the mine is in splendid condition for extracting ore. The vein is 6 ft in width, and gives an average assay of 358 ozs. silver, and 134 ozs. gold. There are now 800 tons of this ore on the dump. Thirty tons were shipped to Salt Lake this year from which the company realized $311.05 per ton. A strong force will be put to work in this mine next year. On the east side of Smiley creek and opposite the Vienna is the King of the Mountain, which is developed by two open cuts across the vein, and a tunnel driven in 80 ft. In opening up this mine 700 tons of ore have been taken out and are now on the dump. This ore is free milling and averages 180 ozs. in silver. The Hidden Treasure group, extensions of the Mountain King, can be traced on the surface a distance of 2,000 ft, and are being opened up by two tunnels. This ledge has a remarkable width. A tunnel was run diagonally across the ledge a distance of 60 ft before the foot wall was found. The other mines owned by the companies have been prospected to some extent, and their dumps hold from 150 to 200 tons of high-grade ore. The companies above mentioned have located a mill site near the new town of Vienna, and about a mile and a half from the mines, and Mr. Johnson says they will take in a 20-stamp mill and roasters as early in the spring as possible, and next year give employment to a large force of men. The town of Vienna comprises about two dozen houses. Ten or 15 men will be employed there all winter erecting buildings for business occupation in the spring.

TEXAS DISTRICT.—Salt Lake *Tribune*, Nov. 0: Mr. Austin O'Toole brought to the *Tribune* office yesterday 1 of the most beautiful specimens of carbonate ore ever seen, from the Ainsley mine, Texas district. He reports 44 ft of the same kind with 60 tons on the dump. Texas district is about 16 miles north of Lemhi Junction, in Idaho. There have been from 80 to 100 miners at work in the district all summer, and the camp is most promising. Mr. A. H. Uhlig, owner of the McClellan, is expected here daily with several carloads of ore. Mr. O'Toole has several locations and reports the mines well defined and are as favorable for richness and permanency as could possibly be found. Next spring some smelters are to be put up there and "then," says O'Toole, "look out for more bullion to the ton than any other camp in Idaho ships."

MONTANA.

EMERALD AND GEM.—*New Northwest*, Nov. 11: J. K. Pardee, Supt. of the Algonquin mine, has leased the Emerald mine from Messrs. Ullery & Thomas, and has men busily at work constructing a whim and shaft house. He also secured the Gem mine and may probably open up a body of pay ore in it during the winter. He left for Helena last week on business connected with his new possessions.

THE Sharktown Tunnel Co. has struck the Scratch Awl mine in the granite. The vein is 7 ft wide and carries 4½ ft of solid ore, every pound of which can be profitably milled. They have about 35 tons now on the dump, the larger portion of which will go better than 100 ounces to the ton. The Algonquin Co. has secured the contract to crush this rock, and if present development continues favorable Murray & Durfee will keep the 20 stamps going steadily.

AT THE TROUT.—The main shaft is going rapidly down, the sump now being 540 ft from the surface. No ore is being stoped from the 400 level. A level will be driven at a depth of 560 ft, the vein crosscut and a new stope started, as the country rock in sinking has changed from blue to white limestone—an unfavorable formation. Every one interested in mining here, and especially in the Trout, is anxiously awaiting the next strike. Chris. Hart spliced the new cable Friday, and everything is reported as progressing favorably.

Smoke in Cities.

The Law Corporate Rights Explained.

An important decision has been rendered in this city by Judge Evans in the case of F. Hufschmidt vs. the California Street Railroad, the object of which was to abate a private nuisance and to recover $10,000 damages sustained by reason thereof. The plaintiff owns and resides in a house on the south line of California street, between Hyde and Larkin, which adjoins the railroad company's engine house. The plaintiff complains of the smoke, soot and cinders from the engine house and the commotion consequent upon the hoisting and lowering of the cars and dummies from the ground to the upper floors. It was not alleged that the defendant had been careless in the use of its works or that any injury complained of could have been prevented without stopping the use of the steam as an agency in operating the road. The only allegation in the complaint capable, in Judge Evans' estimation, of being construed as a charge of carelessness is the lack of sufficient hight to the chimney or smoke stack. The answer denied the alleged damage to the plaintiff's property, and sets up by way of excuse and defense that the erection of the works was authorized by certain ordinances of the Board of Supervisors, in pursuance of specific legislative authority. On the trial the plaintiff introduced evidence tending to show that his property had been injured and its occupancy rendered less comfortable, and then rested his case.

The defendant's counsel read in evidence the several ordinances authorizing the operation of its road, and offered to prove that all possible care had been used in so operating the line. The plaintiff objected to the offer on the ground that it was immaterial as to the amount of care used by the defendant, as it must at all events be responsible for the actual damages sustained by the plaintiff. This question as to the admissibility of evidence of the character in question was reserved for the consideration of Judge Evans, and further trial was postponed until a decision could be had. In a long opinion rendered, Judge Evans admits that the question presented to him for decision in this case is one of the greatest practical importance. If the plaintiff could maintain his action without alleging or proving negligence on the defendant's part, or assuming, as Judge Evans had, that negligence is to be presumed from the injury sustained by the plaintiff, and that the defendant cannot be allowed to rebut this presumption by the introduction of evidence such as that to which plaintiff objected, then it had necessarily to follow, argued Judge Evans, that all persons owning property in San Francisco and suffering from similar causes would be entitled to recover damages, and all furnaces, smoke stacks and steam engines within the city limits might be treated as private nuisances, and the business of all street railroads, factories and machine shops operated by steam power is liable to be destroyed, and this without regard to the legislative grants or franchises under which they have constructed and are operating their works, and also without reference to the amount of care exercised in the use of the motive power specially authorized by law. On the other hand, if the defendant can shield itself under the legislative sanction relied upon, the plaintiff and other persons similarly situated are without remedy, and the beneficial use of their property may be materially and permanently injured without any means afforded by the law of obtaining adequate relief. Thus there is suspended in the judicial balance scale, on the one side the luxury of pure air and individual comfort for the purposes of private dwellings; on the other, the necessities of modern civilization in the manufacturing, commercial and traveling world.

In Judge Evans' opinion, and in the light of the adjudged cases, the former must yield to the latter, and those who live in cities and populous centers, must forego the luxury of breathing pure air, uncontaminated by the dust, soot and smoke of the steam engines, and yield to the business necessities of the common herd in their daily vocations in the pursuit of bread; or, as was beautifully said by Lord Justice James in Salvin vs. North Brancepeth Coal Co., "If some picturesque haven opens its arms to invite the commerce of the world, it is not for this court to forbid the embrace, although the fruit of it should be the sights and sounds and smells of a common seaport and ship-building town." Judge Evans did not attempt to review in his decision all, or even any great number of decided cases, but he had examined carefully many of what appeared to be the leading English and American decisions upon the subject, and while they are not uniform, he was satisfied that the weight of authority is decidedly in favor of the views expressed in his opinion, and supported the conclusion at which he had arrived—that is, that where the Legislature has in express terms, either directly or through the delegation of power to a municipal corporation, authorized the construction and operation of street railroads by means of wire ropes laid under the streets and propelled by stationary steam engines, it must be presumed that the Legislature contemplated the consumption of coal and other fuel for the purpose of generating the requisite amount of steam; and that in doing so, soot, smoke and cinders would escape from the furnaces and be driven upon the property of private persons situated along the line of the road, to some extent injuring such persons in the comfortable enjoyment of their property; and that for such injury they can have no remedy, unless there has been a lack of the greatest possible care in the exercise of the franchise by the means so expressly authorized by law, such injuries amounting to the taking of private property for public use without just compensation, in the sense of the constitutional prohibition upon this subject. Judge Evans therefore overruled the plaintiff's objection to the introduction of the evidence offered by the defendant, which decision may be practically construed as a judgment for the corporation defendant.

Profit of Deep Gold Mines.

The following suggestive item is from the Nevada City *Herald* of the 15th inst.:

The handsome yield of $65,000 from the Idaho for the past month is an evidence that this mine is yet a storehouse of golden wealth, notwithstanding it has yielded over six and a half millions in the last 12 years, and there is every prospect that it will continue to yield profitably for many years to come. The ore which is producing so well and so profitably is mostly taken from the deepest workings of the mine, the 11th and 12th levels, where the vein is strong and uniform in its paying character. Two years ago there were apprehensions that the profitable days of the mine were drawing to a close, as the 10th level east ran into comparatively barren ground, in which the vein did not "live." Since then the No. 11 level has been opened and the drift carried under the barren ground spoken of, and a good-paying and well-defined vein found all the way. The No. 12 level has not been extended as far east as the No. 11, but it carries good ore in its stopes. The No. 13 level is now being opened, a drift having been run about 60 ft. The appearance of the mine is entirely satisfactory, and there is all encouragement to believe that it can be worked profitably to a much greater depth than has yet been reached. The new pumping machinery that provision is now being made for is in anticipation of much deeper working than has yet been attained, and when in place, which will be about the holidays, will be ample for all present and future demands. It is a cause for general congratulation, as regards the future prosperity of this mining district, that the Idaho is proving so profitable at a great depth, as it will be an encouragement for deep working in all of our mines, and tend to dissipate any theory that may be held that gold mines cannot be relied upon for profit at depth.

WAUCOBA.—J. Wal. Phillips and A. McKellips were in town yesterday from Waucoba district. The district is situated just across the summit of the Inyoe, nearly opposite Independence, about 30 miles distant. It was much talked of years ago, when Major Egbert, Dr. White and other members of Camp Independence organized a company headed by Alfred Bierstadt, the artist. Considerable money was spent on the property, building trails and making a great number of openings on the claims, but at no one point was any depth attained of consequence. A complete mill outfit was hauled in through Silver Peak and Eureka valley, from whence the machinery was packed over a mountain spur into the head of Saline valley, when operations ceased, and the works lie there yet. An active movement is now on foot in New York, whereby the Bierstadt M. and M. Co. are to resume active operations on the mines. Gen. Houston, with Prof. Fuller, an expert, is expected here shortly. The other company, recently organized in the East by Mr. Phillips—the Wancoba Con. Mining Co.—has Messrs. Phillips and McKellips at work there now. The chief mines are the Old Argentiferous, Great Eastern, Occidental, Oriental, Underwood, Truman Weed and the Lead Queen. The parties report the discovery of some very large ledges of argentiferous galena, and have no doubt whatever about their ability to show up sufficiently to justify the erection of a 20 or 30-ton smelter by next spring. The district abounds in water and forests of pinon wood, the only drawback now being the lack of wagon roads connecting with the head of Mezourka canyon. It certainly presents an inviting field for capital, and one bound to cut a big figure in the mining world.—*Inyo Independent.*

PLUCKY PROSPECTORS.—The Carson *Tribune* tells of two Germans—Klotz and Keizler—who have been prospecting a copper mine above the town of Genoa, and who certainly have shown no disposition to shirk hard work. It says: "Klotz and Keizler had no money nor mules, but they made a trail one and a quarter miles long, on an angle of 45 degrees, to the dump, and on their backs packed to the town of Genoa 4,600 lbs. of rock. The Lyon mill and mining company have offered $50 per ton for the rock, and a share of all it may bring over that amount. Our German friends will take the rock to Dayton in a few days.

DURING the fiscal year ending June 30, 1880, Idaho yielded $1,980,000 in gold and $450,000 in silver; during the year ending June, 1881, the yield was $1,141,652 in gold and $1,078,916 in silver; total for the two years, $5,020,568. The yield for the current year will probably be as large again as that for the past two years.

THE Central Pacific Company charges $5 per ton for carrying ore or bullion from Kelton to Ogden—a distance of 90 miles, while it only charges $10 to perform the same service from Kelton to San Francisco—about 800 miles.

Mining Rulings.

The following mining points were recently decided in the United States Circuit Court:

The act of Congress of May 10, 1872, authorizes a claim to be located 1,500 ft. in length along the vein, and in the absence of any local rules or custom, the width of such claim may be extended 300 ft. on each side of the middle of the vein; but said act of Congress, by implication, authorizes the miner to limit the width of such claims to 25 ft. on each side of the middle of the vein.

No rights can be acquired under the statute by location before the discovery of a vein or lode within the limits of the claim located.

A location is made valid by the discovery of a vein or lode at any time after the location, provided that such discovery is made before any rights are acquired in the same claim by other persons.

A vein or lode authorized to be located is a seam or fissure in the earth's crust, filled with quartz or some other kind of rock in places, filled with gold, silver or other valuable mineral deposits named in the statute. It may be very thin, or many feet thick, or irregular in thickness, and it may be rich or poor, provided it contains any of the metals named in the statute. But it must be more than detached pieces of quartz or mere bunches of quartz not in place.

A location of a mining claim must be definitely marked on the ground so that its boundaries can be readily traced; but the law does not define or prescribe what kind of marks should be made, or upon what ground or claim they shall be placed. Any marking on the ground claimed by stakes, mound or written notices whereby the boundaries can be readily traced, is sufficient.

The law of Congress requires no record of a mining claim, except in obedience to valid local rules or customs of miners, but when such local rules or customs require a record, it must contain the names of the locators, the date of the location and such a description of the claim by reference to some natural objects or permanent monuments as will identify the claim; but such natural objects or permanent monuments are not required to be on the ground located, although they may be; and the natural object may consist of a prominent post or stake firmly planted in the ground, or a shaft sunk in the ground. If, by reference to any such natural object or permanent monument, the claim recorded can be identified with any reasonable certainty, the record will be sufficient in this particular; otherwise not.

When one person or company owns several contiguous claims, capable of being advantageously worked together, one general system may be adopted to work such claims; and work done according to such system for the purpose of prospecting or working all such contiguous claims, although done on only one of such claims, or even outside of all of them, is available to hold all such contiguous claims intended to be worked or prospected by such general system.

The statute requires $100 worth of work on each claim located after May 10, 1872, in each year, and in default thereof, authorizes the claim to be relocated by other parties, provided the first locator has not resumed work upon it. But if the first locator resumes work at any time after the expiration of the year, and before any relocation is made, he thereby preserves his claim; the statute nowhere authorizes a trespass upon, or a relocation of a claim before located by another, however derelict in performing the required work the first locator may have been, provided he has returned and resumed work, and is actually engaged in developing his claim at the time the second locator enters and attempts to secure the claim.

GREAT SALT LAKE.—One of the wonders of Utah is that of the Great Salt lake. At present it occupies a space of about 3,000 square miles. The greatest length is 93 miles, while the greatest width is 43 miles. Several large islands rise to great hights above the surface, the largest of which is over 30 miles long, and in the widest place about 12 miles across, and it is mountainous in its character, with streams of water, forced by springs and drainage, flowing through the ravines and canyons. On this island, which is called by the name of "Antelope" or "Church island," ranchmen raise herds of horses, cattle and sheep upon the rich land found there. The other islands, of which there are several, are small, and inhabited by loons and seagulls. The flow of waters into the lake from the rivers Bear, Weber and Jordan, and of numerous streams, from actual measurement, is over 6,000 cubic ft. per minute—a quantity sufficient to cover the lake in one year to a depth of 40 inches; but the evaporation is so great in this climate that the great influx is overcome, and the lake remains much the same in hight from year to year. In the spring the water is some inches higher than at any other period. The greatest depth of water fathomed is 60 ft. While the waters of the sea contain about 2% of salt, the waters of the Great Salt lake contain about 22%, or about one-fifth of the bulk. During the summer season the lake water becomes warm, and makes an agreeable and invigorating bath.

NEWS from Altar, Sonora, says that trouble is brewing between American mining companies and Sonora merchants. The latter, it is said, are endeavoring to stir up litigation for the companies, and are coercing the judiciary to aid in their schemes.

Working Tailings.

Last Tuesday we paid a visit to the mill erected by the California Water and Mining Company, at Greenwood, for crushing the tailings from the celebrated French claim, one of the "seam diggings" for which the Greenwood section has been renowned. The mill is a spacious and commodious structure, well arranged and admirably conducted by the present Superintendent of the mine, William Powning, of whom more anon. The mill is run by water-power. The pressure is 200 ft., acting on a nine-foot hurdy-gurdy designed by Mr. Powning. They work it up to about 35 horse-power, and run 4 Huntington batteries (equal to 20 ordinary stamps), 2 rock-breakers (Dodge's patent), 10 concentrators, 2 Knox pans, 1 Atwood amalgamator, and 1 Huntington amalgamator, which latter, with the improvements Mr. Powning has made, is "the boss" amalgamator, at least for the kind of work required of it in that mill. At an expense not exceeding $15 per day Mr. Powning runs the whole business and puts 40 tons of tailings through the mill in 12 hours, or 80 tons at corresponding cost in 24 hours. The body of tailings to which this mill is easily accessible is so enormous as to be almost incalculable, but we feel safe in estimating that there are enough of them to keep 100 stamps running for 20 years. At first these works were placed in charge of a theoretical chemist, who had nothing practical in his composition, and they did not pay. But under Powning, who is not only an experienced, practical miner, but a thorough mechanic and an inventive genius as well, ever on the alert to observe and learn, a man in whom high qualities of brawn and brain are happily combined, the enterprise has become self-sustaining, and it has become a clearly demonstrated fact that by sufficient increase of crushing capacity it can be made to pay enormously. For, even if our estimate is extravagant as to the amount of tailings that is available, it has become quite clear that, after these are disposed of, new supplies can be obtained from the original "seam diggings," which will pay a good deal better than the tailings. We hope and expect in the near future to see at least 20 batteries at work in lieu of the present outfit of 4, when we think that this will be one of the most profitable mining enterprises in the county, and when they get to work on the seams with this increase of crushing capacity we predict results that will appear fabulous.—*Montana Democrat.*

Strike in the San Diego Mines.

From Mr. George V. King, who has just returned from a trip to Julian, we have the following account of the development of an exceedingly rich ore body in the Ready Relief mine of that district. About four weeks ago, at the depth of 350 ft., a ledge was struck which showed very fine ore, and work has since been quietly carried on in the opening of it up. Mr. King, (who is one of the original owners of the Chariot mine), says that the best development of the Chariot was nothing to this. He regards it as the most important strike that has been made in the district. He exhibited specimens filled with gold, and says that one can go with a candle along the ledge for 150 ft. and see similar ore all the way. The development of such a magnificent ore body, at this depth, proves what the *Union* has maintained from the beginning, that the mines of Julian are not mere surface pockets, but permanent ledges, which will grow richer as they are penetrated. The ledge now opened is from two to four ft. wide, the width increasing as it dips downward. It is the most extensive and richest ore body yet opened in the Julian district. Fourteen men have been employed in the mine, but the force is to be immediately increased, the work being pushed night and day. The Ready Relief mine was discovered in August, 1870, by D. D. Bailey, who sold it in 1874 to Adnah Neyhart, of Pennsylvania. Mr. Neyhart put up a fine 10 stamp mill and resided at the mill for some time. During a visit to the East about six years ago he died. About a year ago Mr. Bailey and Mr. Baruch, of Los Angeles, bought the mine from the administrator of his estate, and have since been actively engaged in its development. They may be congratulated upon the ownership of one of the most valuable mining properties in California.—*San Diego Union.*

MEADOW LAKE.—The most romantic town on the coast, says the Truckee *Republican*, is Meadow Lake. It is close up to the summit of the Sierras, near a beautiful lake. It grew up in one summer to be a great town. Thousands of people put thousands of dollars there. There was plenty of gold, rich gold ore there, but the gold had a terrible liking for the rock, and nobody could get it out. A few stayed the first winter. The snow fell 20 or 30 ft. deep. The people made tunnels from one house to the other and contrived to get through the winter. The only way in and out was on snow-shoes. The next spring everybody ran away, and the town collapsed and fell down. Adventurous parties have every year tried to work the ore, with very little success. Walter Hemilton, of Oakland, a mining expert, now comes to the front and claims that he has discovered a process by which the rebellious ores of this district can be worked successfully at a cost of $1.50 per ton, and if he can do so, Meadow Lake will soon become one of the most important mining districts on the coast.

Stampede Gap.

A correspondent of the Pioche *Record* says: My predictions of a few weeks ago as to the large deposits of mineral contained in this section, and the development of the same at no distant day, are rapidly becoming realized. Within the past few weeks there have been two valuable discoveries made here, one by that energetic and veteran prospector, Mr. Simpson, and the other by Mr. Short, formerly foreman of the Bullionville furnace, and his mining partner, Mr. McDougal. Mr. Simpson's claim lies at the base of Stampede hill, and close by the Bristol road. The ground in the neighborhood of the mine has been prospected at different times for years, as there has been very rich float found within a few feet of the late discovery. The formation is blue lime and granite, and therefore a very rich quartzite. Samples teeted in Pioche went from 6 to 800 ounces in silver per ton. The ledge, as I write, is about eight inches in width, with every indication of the ledge widening as depth is attained. In view of the promising outlook of his mine, Mr. Simpson is building himself a house close by, and as he casually remarked the other day, "I am going to stay by this one, you bet!" It seems that the old gentleman was at one time part owner in the since famous Standard mine of Bodie, Cal.; but, like a good many other excitable prospectors, was lured away to the new El Dorado in Arizona, much talked of at the time, but never found. Messrs. Short and McDougal's new find is on the slope of the hill, and near their iron mine. A sample taken from the croppings, and assayed by Mr. Vallejo of Bullionville, went 156 ounces per ton, which is undoubtedly very good encouragement to these gentlemen to work the property.

In my peramhulation through the hills a few days ago, I visited some of the prominent mines around Highland. The Anderson mine, in my opinion, is a valuable property, and one that would materially help this section if it were in the hands of parties capable of developing it in a proper manner. As it is, Mr. Anderson is realizing quite a sum by his own labor, having within a month filled 15 sacks with ore that will average $3,500 per ton, besides shipping to Bristol several tons of a lower grade. I next visited the Magnolia, situated a few hundred yards below on the same hill. It is owned by Mr. Anthony McMahon of Bullionville and a Mr. Lee. It is one of the most promising prospects that it has been my pleasure to see in a long time. They have a very nice shaft sunk on it to the depth of 68 ft., with a four-foot vein of a high-grade chloride, and several tons of the same quality on the dump ready to ship. Truly, it is better to be born lucky than rich in this very uncertain world of ours.

From the very favorable accounts at hand from the Jackrabbit, Mayflower, Mendha and other mines, it is safe to predict a mining boom of no small dimensions in Lincoln county this coming winter and spring, and the revival of the flush days of '72 and '73, so dear to the memory of the old-time Piochers.

Electric Light-houses.—A proposition is before the French Government for the establishment of 67 additional electric light-houses on the French coast at points where they will render the greatest service. It is believed that, with this number and the increased volume of light from the present more perfected lamps, the dangers to vessels will, as far as the French coast is concerned, be obviated. A similar demand is before the English Government for the establishment of 60 additional electric light-houses, and the necessary amount for their construction has been asked for from Parliament. In the United States also the necessity of the establishment on an equally large scale is being considered. The Turkish Government is studying a plan for the creation of an electric light-house system for the coasts of Turkey. The utility of electric light-houses would seem, therefore, to be universally acknowledged.

Cleaning Up for the Winter.—At the Omega tailings mill, Six-mile Canyon, they have commenced cleaning up preparatory to shutting down for the winter. The tailings mills down on the Carson river, however, are able to run all winter, as the snow does not there accumulate on the reservoirs and dumps to such a depth as to give trouble.

There is a great sensation in Lewiston, Idaho, with regard to new diggings on Salmon river. A wing dam put in near Elk creek for prospecting purposes turns out to be an immense success. Two thousand dollars have been taken out by one party in 24 hours. Machinery has been ordered from Portland to work on a large scale.

More Power to 'Em.—The water from the Alta shaft is now being carried up Gold canyon so far as to bring it above the water wheels of the Spanish, Moyle and McGinley mills. This will greatly add to the efficiency of said mills. The top of the Alta shaft is sufficiently high to allow of the water from it being sent up the canyon nearly to the central part of Gold Hill.

The Brunswick mill, Carson river, is running on tailings, reducing about 120 tons per day; the Morgan mill is running on Crown Point and the Vivian ou Belcher ore.

Useful Information.

Cleaning old Engravings.—If brown spots and rings of mildew have not made their appearance, float the engraving face downward for 24 hours on a large quantity of water, in a vessel, perfectly free from grease and soil of all kinds. Lift it from the water on a perfectly clean sheet of glass, drain, transfer to blotting paper without touching it, then transfer to fresh blotting paper, dry, rub with bread as is done in drawings, and iron. If the stains are bad, or are not removed by this plan, place the engravings in a shallow dish, and pour water over them until perfectly soaked. Carefully pour off the water and replace it with a solution of chloride of lime (1 part liq. calcis chlorate to 39 parts water). As a rule the stains disappear as if by magic. If not, pour on the spot pure liq. calcis chlorate; if that does not succeed, add a little acid nitrohydro-chlor. dil. As soon as the stain disappears, wash the engraving carefully with successive portions of water until all the chlorine is removed. Then steep it in a weak solution of glue and gelatine, which may be colored with coffee grounds, to give the engraving a yellow color. Then dry between blotting paper, under a weight, and iron with a sheet of clean paper between the iron and the print. Small grease spots may be removed by putting powdered French chalk over them, a piece of clean blotting paper over the chalk, and a hot iron over that. If the stains are larger, benzine must be used, applying it in a circle around the stain before touching the stain itself.

White Lead.—Mr. G. J. Lewis, of Philadelphia, proposes to obtain white lead by beating the fumes of lead resulting from smelting processes, and then passing it into a cooling retort. Finely powdered sulphuret of lead (galena) is introduced into a funnel, whence it is forced by a bellows into the retort. This retort is heated to a red heat, which causes the sulphuret of lead to sublime and to deposit itself on the cooler surfaces. The fumes of lead then pass into a cooling chamber, and finally into a reservoir where the product is collected. Another method of obtaining white lead is to introduce sheet lead into a chamber containing jars of acetic acid, the atmosphere being heated by steam to a temperature of from 30° to 50°, besides being strongly impregnated with carbonic acid.

A New Feminine Necessity.—Among the latest Parisian novelties is the advent of the paralune as a supplement to the parasol. The rays of the moon are quite as dangerous as those of the sun, say the chroniclers of the novelty. One can be moonstruck just as one can have a sunstroke. If the sun browns the skin, the moon dries and wears it out, just as it affects the surface of stone. Therefore, the ladies who are staying at country houses where long country walks at night are often arranged, that one may enjoy the moonlight, should remember to secure one of the dainty paralunes made in gauze, lined with red silk, which are declared to be the last effort of fashion.

Nickel Table Utensils.—Since the process of making malleable nickel has been perfected, many articles made of this material, and especially nickel table utensils, are coming into extended use. They are manufactured in large quantities in Prussia, and are much preferred to similar articles of other materials. The hardness of the metal renders it capable of acquiring a high polish, which is not readily injured by friction; grease or dirt does not adhere to it firmly on account of the smoothness of its surface, and the cleaning requires very little exertion. It does not tarnish when used frequently, and has, moreover, the advantage of possessing about one-half its original value when worn out.

An Electric Letter Carrier.—Dr. Brunner, of Wattenwell, Austria, has invented an electric letter carrier, in the form of an underground railroad moved by electricity. The invention is at present before the Austrian Society of Engineers for inspection. The locomotive can be guided and controlled from a stationary point, because the battery or motive power is not on the locomotive; it does not need any accompanying attendance. The locomotive and train can be constructed of any diminutive size, and both will perform the same service for any length of distance which the pneumatic tube will perform for short distances.

Stove Polish.—The fine polish given stoves by those skilled in the art, is produced as follows: Have a thin mixture of black varnish and turpentine; apply this with a paint or varnish brush to a portion of the stove; then with a cloth dust this over with pulverized British luster or stove polish; then rub with a dry brush. The stove must be perfectly cold. The stove dealers buy the pulverized stove polish, which is carburet of iron, in 25-lb. packages. The process conducted in this manner is quite brief, but gives beautiful results.

To Make Cisterns and Tanks Water Tight.—Paint thickly on the inside with a mixture of eight parts of melted glue and four of linseed oil, boiled with litharge. In 48 hours it will be so hard that the tank can be filled with water.

What Is Linoleum?—A contemporary answers as follows: We have been informed by what we regard as good authority that it is made by covering strong jute cloth (burlap) with a mixture of linseed oil and cork powder, to which some mineral color has been added, to form a ground on which the pattern is subsequently printed. The general process of manufacture is doubtless identical with that of oil-cloth. With respect to the wearing qualities of linoleum, we can speak from personal knowledge in terms of the highest praise. The material is elastic, accommodating itself readily to the irregularities of the floor on which it is laid, and is not liable to crack when laid down on a rough or uneven floor. In this respect it is greatly superior to oil-cloth, which is notoriously troublesome in this particular. This same quality—due, no doubt, to the elastic nature of the cork it contains—gives it excellent wearing qualities, in which respect also it is decidedly superior to oil-cloth. It will bear the roughest usage, and almost completely deadens the noise of footsteps. The material is, without doubt, excellently adapted for its intended use, and has come to be very generally introduced as a substitute for oil-cloth.

Cotton and Straw Dwellings.—At the South, it has been demonstrated that fire and water-proof houses can be built out of straw. The cotton used is the refuse of the plantation and factories, and when ground up in about an equal amount of straw and asbestos, is converted into a paste, and subsequently into large slabs or bricks, which become as hard as stone. The article thus made is pronounced the best of architectural material, and will be much used.

A beech railroad tie, it is said, if effectually preserved from rotting, is better than white oak. Elm, black and white ash, if effectually preserved, will hold a spike about two-thirds as well as beech or oak, and one-third better than chestnut. Soft maple and sycamore hold a spike about four-fifths as well as chestnut, about two-fifths as well as oak or beech, and about one-half better than hemlock. Seasoned white oak is about one-third less effective than green timber in holding a spike.

Lime Bricks.—Among the patents issued in September last, was one to Jacob Rsese, of Pittsburg, Penn., for making lime brick. The method consists in burning and indurating lime or limestone at a high temperature, then grinding it and mixing it with water charged with silicate of lime until it assumes a plastic condition, and then molding and burning the brick in the usual manner.

Good Health.

To Avoid Epidemics.

In a state of health there is a certain degree of *excitement* in the system. This is, the pulse beats a certain number of times every minute, averaging about 68. If, during the cholera or any other ordinary epidemic, the pulse does not go below that, and the general system is in good working order, the disease does not attack the person, nor will it as long as he remains in that condition. Nor will he be likely to suffer from the epidemic if he keeps the system steadily above the natural excitement. But the very moment the pulse is below par in rapidity and vigor, that moment is the individual more liable to disease in proportion to the deficiency. A person in good bodily condition, then, is at par, and is not likely to be attacked by any ordinary epidemic disease; and if in that condition he take a glass of brandy, he is less liable still, until the exciting effects of the liquor have subsided, when he falls below the natural standard, just as far as he was a while ago above it, and is in proportion more liable to the disease than if he had taken no brandy at all. Therefore, having commenced taking brandy, he must keep it up day and night, never letting the system go below par, or he is a lost man. Hence it was that men who were always full of liquor escaped cholera in numerous instances, and the report went forth that brandy prevented cholera; thus multitudes were introduced into the wretched habit, and perished in a drunkard's grave.—*Journal of Health.*

Shampooing.—When the barber kindly informs his patient that his hair is very badly filled with dandruff, and proposes to shampoo it as a remedy, it is safe to say "No," most positively; the majority of barbers use as a shampooing liquid, either solution of "salts of tartar" alone, or mixed with borax. They are probably not aware that "salts of tartar" is but a name for purified potash. When a solution of this is put upon the head it combines with the natural oil of the hair and scalp, and forms a soap which makes a dense lather in the hair; this is washed out, and while it effectually removes the dandruff and dust, it has also removed the oil which is needed to keep the hair in a healthy condition. Avoid all such shampooing. A teaspoonful of powdered borax in a quart of water forms a safe shampooing liquid, but still better is the yolk of an egg, worked thoroughly into the hair, applying a little at a time, and then wash it out. The egg will leave the hair surprisingly clean, and the scalp soft and free from dandruff.—*American Agriculturist.*

Benefits Derived from Washing in Cold Water.

As in most things, so in washing, there are two ways of doing it. Some people take a bath who have but a dim idea of washing themselves, and are vexed and annoyed when told the result is not happy.

It is a well-known fact, but rarely remembered, that the skin is one of the great safety-valves of the human machine—that the millions of little perspiratory tubes with which it is pierced throw out from the inner body an average amount of 33 ounces of greasy refuse and worn-out material in an hour, in the shape of invisible perspiration and in the same time often as much as two or three lbs. in visible perspiration. Should these tubes or pores be allowed to remain choked with their own secretions, the refuse matter is thrown back into the other great corporeal scavengere—the lungs, stomach, liver or kidneys. Thus it stands to reason that a careful and general cleansing of the skin is absolutely necessary to the life and well-being of the individual at least once in 24 hours, and few people who rejoice in the comfort of cleanliness will feel that it is secured under this amount of washing. And we should also here point out the mere passage of water, especially cold water (*e. g.*, what is ordinarily called a sponge bath), does not cleanse. In fact, it rather has a tendency to close the pores, which, like delicate flowers, shut up to a cold current of wind or water. We therefore recommend, as warm or tepid water tends to open the pores, to use that with the course of soap scrubbing (not an unreasonable friction) which should precede the universal sponging. This last may be done with cold water, which certainly invigorates and braces the system when followed by a reactionary glow of warmth. Should this not occur it is unwise to use it, and warm must be substituted, especially in the case of children, who by ignorant mothers are often forced into cold water (from which they have not a sufficiently active circulation to recover) as part of that much-abused system of "hardening," which, nine times out of ten, ends in "hardening" the child off the face of the earth, or checking its growth.

"Hardening," it must be understood, should be strengthening, not "roughing," and many people with the best intentions think, very erroneously, that to make a child strong consists in causing it to undergo more physical hardships than they, with their perfectly matured strength and age, would dream of doing.

As people, in conclusion, generally rush to extremes, it might be well here to remark that we do not at all recommend coddling; but no wise mother will put her young children into quite cold water in winter time, nor with a cold, and, above all, will never allow them to be washed and bathed in a draught, on the same principle of consistency that plenty of fresh air is good, when it is not damp or foggy, but drafts are most injurious.—*Journal of Health.*

How to Grow Beautiful.—Persons may outgrow disease, and become healthy, by proper attention to the laws of their physical constitutions. By moderate and daily exercise, men may become active and strong in limb and muscle. But to grow beautiful, how? Age dims the luster of the eye and pales the roses on beauty's cheek; while crow-feet, and furrows, and wrinkles, and lost teeth, and gray hairs, and bald head, and tottering limbs, and limping feet, most sadly mar the human form divine. But dim as the eye is, as pallid and sunken as may be the face of beauty, and frail and feeble that once strong, erect and manly body, the immortal soul, just fledging its wings for its home in heaven, may look out through these faded windows as beautiful as the dewdrops of a summer's morning, as melting as the tear that glistens in affection's eye, by growing kindly, by cultivating sympathy with all humankind, by cherishing forbearance toward the foibles and follies of our race, and feeding day by day on that love to God and man, which lifts us up from the brute and makes us akin to angels.—*Journal of Health.*

Vaccination.—It is strange that so many persons declare their want of faith in the virtues of vaccination, when volumes of proof might be produced to prove its efficacy in preventing the attacks of small-pox. The greatest mortality from this disease has always been found in localities where vaccination was refused or neglected. In Chicago it is stated that 40 % of 359 cases since January 1st have proved fatal, and a large proportion of the fatal cases have occurred among the populations who resist vaccination with violence. Eighty-one out of 108 deaths from small-pox in September were in a ward where there are 40,000 persons who have not been vaccinated. This is but the repetition of a story that has often been told with much more melancholy details. Vaccination costs little or nothing, but as it is well established that it is, in a large majority of cases, an effectual preventive of small-pox, those are to blame who refuse to try it.

Dog Meat.—Robert Bloakie, who has just died in Wabash, Ind., had for nine years lived chiefly on dog meat, which he declared to be wholesome and palatable. His family relish the same food, and propose to continue its use.

Another electric railroad will soon be opened at Berlin. Siemans and Halskie have apparently made a success of the experimental one noticed previously.

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER.

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SAN FRANCISCO:
Saturday Morning, Nov. 19, 1881

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Passing Events.

A convention of miners and farmers was to have been held in this city this week, hut, owing to the fact that the Gold Rnn case is now going on in Sacramento, the convention was postponed nntil the conclnsion of that case. The testimony taken this week np to this day (Thursday) has been mainly from J. N. Hoag and J. M. Hoagland, as to knowledge of the Sacramento and American rivers since 1849, and to the damage done hy the deposits of slickens. Hoagland testified to much the same as Hosg. Counsel in the cese are: For plaintiff, Attorney-General Hart, George Cadwalader, ex-Chief Jnstice Rhodes and I. S. Belcher; for the defense, S. M. Wilson, ex-Chief Jnstice Wallace, W. C. Belcher, J. K. Byrne, A. B. Dihble and A. P. Catlin. There are engaged on the case six phonographic reportere, and the witneeses are nnmeroue. The case will prohahly last 10 days.

The Sheriff has this week again vieited the hydraulic mines in Nevada county. At all the mines vieited no work was being done, and in eome of them water was not even rnnning. Owing to the reeignation of R. McMurray, late superintendent for the Enreka Lake Co., no superintendent or managing agent for that company conld he found, and the Sheriff was ohliged to serve the notice hy posting it on the company's office. The China Co. at Moore's Flat were served in like manner, bnt in the rest of the mines the superintendents or foremen were found.

This week's PRESS will he fonnd to contain several valuable articles to the miners of the coast and to the mechanics also. To the lstter Mr. Richard's lecture on "Constrnctive Processes" will prove of interest, written as it is by an eminently practical man.

We have eent this week a representative of the PRESS to Arizona to sesrch out for ns all the matter of interest he csn find in that region which will he of interest to our readers.

The fact that the mines of thie country produced during the year 1880 over $87,000,000 in gold and eilver, actnally recorded hy mint statements and transportation companies records, is an item worthy of conaideration hy thoee who still lshor nnder the impression thst this industry has made no return for the grest outlny thst its successful working requires. In addition to this snm of money, added to the indestrnctihle weslth of the conntry, there is a large prodnction of which no record can he kept, as a large proportion of onr mines are worked hy private parties and companies, which amonnt we are inclined to estimate nearly, if not qnite, equal to the recorded ontput.

The Garfield Shaft.

The Quickeilver Mining Co., New Almaden, Santa Clsra county, are sinking a new shaft which is called the Garfield shaft, in honor of the late President of the United States. The manager intends making it a model piece of mining work, worthy of its namesake in every respect, inclnding the machinery for nperating it.

Mr. J. B. Randol, the manager, has sent a memorandnm to the fonndrymen of this city, regarding the work the company desires to perform, asking them to submit for approval, plans and estimates for an engine or engines with steam generators, all so designed as to do the required work in the hest and most perfect and economical manner. Fuel at the mine is expeneive (coal, a ton of 2 240 lbs., $12, aud wood $7 a cord), and it is desirahle to work stenm to as great a degree of expaneion as poseihle.

The requirements for the hoisting outfit in the new shaft sre ae followe:

Skip, weight, 1,700 lb; ore, weight, 3,000 lbs.; round steel rope (1,800 ft.), 2,900 lbs.; speed of skip per minute, not less than 600 ft.; nnmher of loads daily, 200, of which 140 may be taken as ore, and 60 as men and materinls. One hundred loads of ore are to he raised in 12 hours.

The greatest depth of shaft will be 1,800 ft.; a level at every 100 ft., commencing at 600 ft. from the surface.

The engine is to combine, so far as possihle, maximum of expansion, maximum equality of motion, and the greateet compectness, strength and cheapness, not only as regards the engioe itself, hut with regard to the engine-house and fonndations.

The hoisting gear to he nsed, is to he such es to employ the engine to the heet advantage, and to he perfect in every respect. The drums and pit-head pnlley are to he not less than 10 ft. in dismeter.

As soon as the contract for this machioery is awarded, we shall publish the details of the plans selected.

The Debris Convention.

The convention of miners snd farmers which was to have met in this city on Thursday, wns postponed, pending the trial of the Gold Run case, at Sacramento. A few daye since, the farmers of the Anti Debris Association bad thonght that they would hardly be prepared to send their delegates on Thursday, hnt at the reqnest of Mr. Hawley, President of the Debris Committee, had decided to send them, even if the time desired for their selection was not allowed. Then came the reqnest of Mr. Hawley, although that gentleman stated that the miners would send delegates if the farmers opposed the delay. The Gold Run case had heen called, and as it had several timee heen continued, Judge Temple insisted npon its hearing, and it was thought that it wonld occupy at least two weeks. President Sexey, of the Sacramento Valley Anti-Debris Association, agreeing to a delay, the meeting of the convention was continued without day.

Mr. Gordon, Secretary of the Debris Committee of the Board of Trade, is in receipt of numerons letters from the interior commenting upon the report of the committee published last week. He says that every miner, whether of large or small intereet in the subject, that hae written or conversed with him, ie pleased and perfectly satisfied with the report of the committee. On the other hand, he says he has yet to meet or hear from the first farmer or land owner who is willing to admit their satisfaction, hut rather complain that the committee did not go far enongh in their recommendations. The farmers are ready and willing, however, to attend the convention proposed in the committee's report. The miners are aleo as desirous to participate in the convention, and only ask a delay in calling it until after the great mining suit now on trial at Sacramento is ended, as many of the pereons they desire to send to that convention are engaged in that trial. Mr. Gordon states that the convention will he called at the earliest date consistent with the miners' request.

An Appendix to "Testing and Working Silver Ores."

By C. H. AARON.—*

Since the above hook was published certain facts hsve heen observed with which it is proper that those who hsve purchased it should he acqnainted.

Crocker's trip-hammer battery and Kendall's oscillating hattery hsve been condemned for want of durahility. Noyer's pulverizer does not appear to have come into use. Aaron's amslgamator hee not been constructed on a lsrge ecale. The vacuum chamher for leaching apparatus No. 1 hss heen found inferior to pumps. The leaching apparatus No. 2 hae not heen tried. The apparatus deecribed for drsining a portion of the water from wet-crushed ore, and avoiding the necessity of shovseling the pnlp out of settling tanks hae not heen tried, hnt the writer still thinks it worth trying. Something similar has been used with success.

A rock-breaker and a pulverizer on a new principle, have been invented hy W. C. Morieon, nf thie city. The same principle is applied in hoth. The device is eimple, yet its action in crnshing ore is complex. An idea of it may he formed hy supposing a coffee mill, of the kind which is mounted on a small hox, to have its crushing surfsces smooth instead of corrugated, its outer cone revolved hy gearing or helt, its inner cone free to rotate on its axis, and thie axis *slightly oblique to that of the outer cone.* The laet point is that which makes this essentially a *crushing*, not a grinding mill. The two axee, intersecting at a point near the bases of the cones, diverge towards their upper ends. The result of this arrangement is that a horizontal section at the hase of the outer cone shows an outer circle inclosing an inner ovoid which is practicslly a circle, concentric with the outer circle. A section at any point above the hase would show two eccentric circles, the one within the other, the eccentricity, ae well as the interval between the two, increasing as the section is further removed from the haee. If a piece of rock be placed hetween these circles at the point of greatest interval, and the outer circle he made to revolve, the rock, pressed against the inner circle, canses that to revolve also. The rock is thus carried into a narrower epace, and crushed with greater force, until, having pessed the narrowest point in thie zone, the fragments again coming into a wider space drop to a lower zone, nre egain carried around to the narrowest point in that zone, and again crushed, and so on until they emerge at the base of the machine either as small fragments or ns a fine powder, according to the adjustment.

The theoretical merits of the device are remarkahle, and there is no apparent reason why they shonld not he realized in practice. The action is eseentially crushing hy compression, continuous in a general sense, yct intermittent ae to any particular piece or set of pieces of rock. At the same time the conditions are euch that it is impossihle for any two points in the crushing surfaces to remain opposite to each other for more than an instant of time. There ie thus a slight hut constant grinding in hoth a vertical and horizontal direction. This peculiarity is likely to prevent the surfaces wearing in grooves or depreseions. The plane of rotation of any given zone on the surfnce of the inner cone heing obliqne, tends to carry the rock downward while crushing it against the horizontally revolving onter cone. This assists the discharge. The machine ae a breaker ie free from the tremendous shocks to which a Blake or Dodge is exposed, heing in fact a machine of "constant contact" if continuously supplied with rock.

I have epoken of cones only for convenience. The crushing surfaces are really in hell form, more especially so in the pulverizer, in order to give it sufficient capacity for dischsrging. A pulverizer on this plen has, ae I have heen informed, heen at work for a numher of weeks in Amador, giving great eetiefaction, and though only some 18 inches in diameter, doing, it is said, the work of a 10 stamp hattery. It is presumable that the ore is first passed through an ordinary breaker, as the breaker on this principle hae not yet heen conetructed. The machines will work either dry or wet, and there is a prohahility that even damp ore will psss through them hetter than through eny other pulverizer. It is also expected that coarse metal, horn silver, etc., which cannot he pnt through a sieve, will pass out of this machine in thin plates.

Tustin's pnlverizer has heen perfected, and ie a good machine. Self-feeding and discharging through sieves, it takes the ore in piecee the size of a walnut, and redncee it to any required finenese. It empties itself completely when the feed is stopped, unless there is coarse metal, or other matter which cannot he pulverized, in the ore. It works wet or dry, and is easily opened for cleaning. This machine is a revolving drnm, in which the ore is crnshed hy means of rollers working on dies. By an ingenione arrangement, it is made to indicate the quantity of ore that it contains at any given time, which is an advantage not possessed hy other machines of the clase. One of these machines has heen at work for a long time in the eampling works in this city, and hae given great satiefaction.

Silver ore ie now heing worked by amelgamation in a series of pans on successively lower levels, the pulp flowing continuonsly through them. The result is ssid to he sstisfsctory, and there is a saving of lahor and expense. The arrsngement ie similsr to that used long sgo for gold, and known as the Hungarian howls. The practice of grinding the pnlp in the psn has heen very generally diecontinued, it having been found that as high a percentage can he got, snd finer hullion, hy crushing the ore finely in the hattery and working the pan with the muller rsised. In thie way, certain hsse ores, eucb ss psrtzite, and ores containing carbonate of lesd, which formerly yielded a low percentage, and hase hullion, when worked raw in psns, sre now treated snccessfully.

On psge 30, it is stated tbst the carbonstes of lime and of lesd canse a large consumption of chemicals in working ore raw. It hss since heen ascertained that, while this ie true ss to acids and as to the protochlorides of copper and iron, it is not so as to the dichloride of copper, which is not decomposed hy such carhonates. Hence, in treating ores containing carhonste of lime or of lead, the dichloride should he prepared in advance, instead of being formed in the pulp.

Dichloride of copper can be made, in addition to the methods described, hy passing sulphurous acid gas into a hot solution of hluestone and salt. A suitable proportion nf salt to use, if the dichloride is to he collected, is rather lese than half the weight of the hluestone. The dichloride is precipitated as a white powder. It dissolves reedily in bot hrine.

Oxide of manganese, sometimes found in conjunction with oxide of iron in silver oree, decomposes hoth of the chlorides of copper, and is therefore an obstacle to their use. Sulphurous acid gas injected to the pulp, will render it harmless. In one csse of this nature it was eaid that good results were ohtained hy pssing a moderate quantity of chlorine gas into the pulp in the nen. This should be done before putting the quicksilver in.

I heve received letters from several gentlemen who were treating ores with hluestone and salt in Purvine psne, and who complained of getting their bullion hase. The Purvine pan is a wooden vessel with a stirrer and copper amalgamating surfaces. I can only account for the base bullion hy supposing that the rapid motion of the pulp in these pans wears away the copper plates.

* Published and sold by Dewey & Co., 252 Market St., San Francisco.

Prospecting British Columbia.

A party of prospectors have returned to Victoria, B. C., who hsve heen hunting for mines this summer in the interior. After getting well up the Skeena river, in order to get over the larger district of country, esch detachment was supplied with Indinn help. They examined thoroughly all the northeast braoches of thie river, prospecting every stresm coming in from that direction.

The country there ie not a gold-hearing one to any extent. The party then struck over a low divide, not more than 10 miles acroes, to the streams emptying into the Findlay hranch of the Peace river.

This section of the proviace has the appearance of heing much more likely to produce gold in paying quantitiee. Slate and quartz were found in ahundnnce, and small prospects were ohtained in many plscee. Some 25 or 30 streame were visited and named in what is called the Bear Lake region. By the time the party reached those streame, the season was far advanced, and time would not admit of a very thorough examination.

The mountains are hare of vegetation, hnt the valleys are open and greeey, and particularly free from fallen thick timher. In this respect the prospectore were not hindered in the least in their movements. Moose, carihou, hear, grouse and other kinds of game were found in the greatest abnndance, it heing no nncommon thing to have a couple of carihous in camp at the same time. Fieh also were wonderfully plenty. Before going even to the streams emptying into the Findlay, the party penetrated fully 350 miles into the interior of the country.

The proepectors are fully of the opinion that placer diggings will he found on the tribntaries of the Findlay, and that a season epent in that section would develop a mining region that would pay, if not largely, at least good wages. Timher, although not abundant enough to he troubleeome, ie yet to be fonnd in sufficient quantities for all purposes. Grass is in greateet profusion, and covere all the valleye and far up the sidee of the mountaine. In fact, nothing appears to be wanting to supply the wants of a mining population if gold can he found in paying quantitiee; and every member of the party ie of the opinion that thie is only a question of time, and a little more pereevering explorations.

ARIZONA CORRESPONDENT.—Mr. George Madeira, our Arizona correspondent, left this week for Yuma, where he will remain a few days, and will then go into Arizona, visiting Florence, Tombstone, Bisbee and other points in the Territory. Mr. Madeira goes specially in the interests of the MINING AND SCIENTIFIC PRESS, to gather for us informstion concerning the mining and other interests of Arizona. He is also authorized to receive subscriptions, and we hope our friends will favor him where they have an opportunity.

ON the lower levels of the old honanza mines there is now au excellent circulation of air and the men are comfortable at all points where work is in progreee.

California Threshing Machinery.

Our readers at the East and abroad ask us frequently for information, which will give them a better idea of our improved California threshing machinery than they can get from the descriptive articles and advertissements which appear in our columns. They get a knowledge of the special features of the new machinery, but they lack a comprehensive iden of its appearance and the relationship of the parts. This we hope to furnish by the engraving on this page which, though it may lack somewhat in the picturesque is a true portrayal of the machinery as set for operation, for it is made from a photograph taken on the spot.

The illustration represents a complete California threshing rig as now used by our best and most enterprising threshers. The engraving was made from a photograph taken of one of G. W. T. Carter's machines while threshing on the farm of Chas. Sperry, near the Tuolumne river, in Stanislaus county. The rig consists of a Gold Medal separator, Rice strawburner engine, Jackson's self-feeder, elevator and low derrick, water wagon, cook house and "trap" wagon. All except the engine and separator are mounted on Schutler iron-axle wagons.

Although there is considerable machinery used to perform the work, it is handled easily in the hands of an experienced thresher. In less than five minutes from the time the belt is thrown off, everything is on the way to the next stack or setting. Upon arriving at the stack, the derrick is driven close in. The foreman steps off the distance from the derrick for the separator, which is driven in immediately.

The elevator is placed in position, extending from the derrick to the self-feeder. The forkers are setting the guy rope and getting their forks upon the stack. The drivers are getting

A PLANT OF CALIFORNIA THRESHING MACHINERY IN POSITION FOR WORK.

out their ropes, hitch up their horses and begin to fill up the derrick platform.

In the meantime the engineer and fireman have run out the belt from the separator and marked the place for the engine, which is generally driven in so accurately that little shifting is required. As the engine steps, the fireman starts his fire, and as the engine is moved with about 60 or 70 lbs., as soon as the necessary pressure to start up. The belt is run on; the word comes from the foremen, "all aboard," which is responded to by the engineer starting up his engine, and in five minutes from their arrival upon the ground everything is under headway. Twenty minutes is considered ample time to make an ordinary move and get to work.

The grain is taken from the stack with the horse forks and dumped on the platform at the end of the elevator. The "hoe-downs" pull it down with an implement similar to a potato hook; the elevator conveys it to the self-feeder, which carries it to the cylinder. While on its way up the elevator, the grain has to pass under the "spreader," which loosens up all the bunches and perfectly regulates the amount of feed required by the cylinder.

There are employed 3 forkers, 3 drivers, 3 "hoe-downs," 1 sack tender, 1 sack sewer, 1 sack packer or carrier, 2 straw hucks, 1 water buck, foreman, engineer, fireman, trapman and cook—in all, 20 men, and whose wages aggregate $50.75 per day. Fourteen horses are used. The trapman looks after the blankets, traps, etc., goes errands and moves the cook's house, which is shown at the extreme right of the picture. At night the men make up their beds around the stack, and in the morning roll up their bedding and throw it in a pile for the trapman to take care of and have on hand wherever their camp may be at night.

The average work of the machine is about 100 sacks per hour; average weight, 135 lbs. per sack. The last 20 days in the field this season, the rig shown in the picture threshed 20,500 sacks. In the season of 57 days, it threshed 54,000 sacks. The best day's work was 1,404 sacks. This will give an idea of the capacity of this machinery. The amount of steam carried varies from 90 to 100 lbs. The whistle blows at 4:30 A. M. for breakfast; the machine starts at 5, and runs until sundown, with one hour for dinner. The entire outfit cost $4,800 in the field ready for work.

Practical Lectures to Mechanics.

Constructive Processes.

The third in the series of lectures to the mechanics of San Francisco, at Capt. McNevin's Nautical School, corner of Beale and Harrison streets, was delivered on Monday of last week. The subject was "Constructive Processes," and the lecturer Mr. John Richards, superintendent of the San Francisco Tool Works. Mr. Richards spoke as follows:

In 1873 and thereabout, when Prof. Morton, now President of the Stevens Institute, was the editor of the *Journal of the Franklin Institute*, that old and honorable serial drifted into what the boys called "high science." Notwithstanding the efforts of Prof. Morton, who is a most able, and I may add, practical scientific man, the *Journal*, as well as the Institute, became engrossed in dried grasshoppers, petrified toads, the transit of planets, and so on.

The Franklin Institute was founded for the promotion of mechanic art, by mechanics and for mechanics. It was not intended, of course, to confine its labors and aims to constructive processes, but it *was* expected by its founders that applied science should have the first place.

Dissertations on these antiquarian and high scientific subjects are safe and cheap. There is perfect safety in laying down a hypothesis of "prehistoric man," but there is a good deal of risk in venturing an opinion about the cooling

entirely chairman has only allowed me three evenings in which to prepare a paper for to night (two of which were otherwise taken up), and I have concluded to run over some of those old articles, selecting here and there sections that I think suitable, and extemporize remarks when they are required.

Do not, however, imagine that I have wasted four pages of foolscap to explain how shop manipulation came into existence.

The history of the Franklin Institute, which I did not finish, points a strong

Moral for Our Operations Here.

We must, to use a political phrase, deal with living issues—with tangible things. The newest inventions in mechanic art should have the first place. Every week there are new steps made in some branch of engineering and mechanical work. The principal means of progress is by reading, and most of all, the serial publications of this and other countries.

Referring again to the Franklin Institute, I will mention that these crude, unpolished, unscientific articles on practical matters, had the desired effect; not mine so much as others, perhaps. Mr. Cooper's essays on belting, or "bands," which is a much better name, were prominent as a means of awakening interest.

In a few years there was courage mustered up to hold an exhibition of machinery and tools. Thirty thousand dollars of clear profit was made; the Institute was redeemed and once more became what its founders intended, an Institute to promote mechanic art.

Before entering upon the regular lecture for the evening, I want to say a few words respecting

Methods of Studying.

Mechanics have no time to waste in beating the air, and efforts devoted to study should bring the largest possible returns.

Mechanical knowledge reduced to its most simple form, is facts explained by common sense. Reasoning is the great power to be relied upon, and logical deduction the true method. Formulæ, tables, rules, and so on, are only a means of memory; they bear the same relation to mechanical knowledge that a knife and fork does to the food we eat.

Prof. John Swett, of Cornell University, in an address delivered some years ago to the mechanical engineering class of that institution, made this remark:

"When you go out from this place into the world to apply what you have learned here, you will find that it is not what you know that will be paid for; it will be what you can do." This is a great truth, the great fact, indeed, of what is called mechanical education. It is what we *do* that alone has value.

Our Text Books

In time past have been as bad as could be, especially those of an elementary kind. How many of you here can remember the school books, for example, that tell us of the "mechanical powers," the wheel, lever, screw, wedge, and so on. Now, what can a "mechanical power" mean, or be, and if the term can have a meaning, why select a few devices for changing power and motion, and call them mechanical powers? It sounds like the teachings of Aristotle.

Books of reference, containing all kinds of computations, there are no want of; but reasoning books, I will call them, that, explaining why things are so, are not so plenty. The best one I can refer to, and one that will serve as a base for a complete mechanical education is the "Conservation and Correlation of Forces," published about 12 years ago by Harpers, of New York. It does not, I believe, contain a figure, is addressed to the reasoning faculties, and I have never heard of anyone who had read that book, attempt to make a perpetual motion or a contrivance to augment power. I may mention some other books at some future time. This one is enough for the present, and I trust most of you here will procure a copy and read it.

From books we gain general knowledge; from practice we gain special knowledge. Whatever is learned belongs to one or the other of these classes or divisions.

To make this plainer, the laws of forces, the proportion of parts, strength of material, and so on, are subjects of general knowledge that may be acquired from books, and understood without the aid of an acquaintance with the technical conditions of either the mode of constructing or the manner of operating machines; but how to construct proper patterns for castings, or how the parts of machinery should be molded, forged or fitted, is special knowledge, and must have reference to particular cases. The proportions of pulleys, hearings, screws or other regular details of machinery may be learned from general rules and principles, but the hand skill that enters into the manufacture of these articles cannot be learned except by observation and experience. The general design, or the disposition of metal in machine framing, can be to a great extent founded upon rules and constants that have general application; but, as in the case of wheels, the plans of molding such machine frames are not governed by constant rules or performed in a uniform manner. Patterns of different kinds may be employed; molds may be made in various ways, and at a greater and less expense; the metal can be mixed to produce a hard or a soft casting, a strong or a weak one; the conditions under which the metal is poured may govern the soundness or shrinkage—things that are determined by special instead of general conditions.

During the meeting of the British Association in Belfast, 1874, the committee appointed to investigate the means of teaching physical science, reported that "the most serious obstacle discovered was an absence from the minds of the pupils of a firm and clear grasp of the concrete facts forming a base of the reasoning processes they are called upon to study; and that the use of text books should be made subordinate to an attendance upon lectures and demonstrations."

Concrete Facts Concerning Steam Engines

In respect to a steam engine, the concrete facts in part may be named as follows:

To summarize, we have the following propositions relating to steam machinery:

First—The steam engine is an agent for utilizing the power of heat and applying it to useful purposes.

Second—The power of a steam engine is derived by expending water in a confining vessel, and employing the force exerted by pressure thus obtained.

Third—The power developed is as the difference of volume between the feed-water forced into the boiler and the volume of the steam that is drawn from the boiler, or as the amount of heat taken up by the water.

Fourth—The heat that may be utilized is what will pass through the plates of the boiler and be taken up by the water, and is but a small share of what the fuel produces.

Fifth—The boiler is the main part, where power is generated, and the engine is but an agent for transmitting this power to the work performed.

Sixth—The loss of power in a steam engine arises from the heat carried off in the exhaust steam, loss by radiation, and the friction of the moving parts.

Seventh—By condensing the steam before it leaves the engine, so that the steam is returned to the air in the form of water, and of the same volume as when it entered the boiler, there is a gain effected by avoiding atmospheric pressure, varying according to the perfection of the arrangements employed.

If the whole amount of heat represented in the fuel used by a steam engine could be applied, the effect would be, as before stated, from 10 to 15 times as great as it is in actual practice, from which it must be inferred that a steam engine is a very imperfect machine for utilizing heat. This great loss arises from various causes, among which is that the heat cannot be directly nor fully communicated to the water.

(Continued on Page 340.)

THE FRANKLIN GIRDER!

BY FAR THE MOST ECONOMICAL OF ANY CONSTRUCTION MADE.

—o—

This new and economical Girder for Buildings and Bridges, made of any desired length and to sustain any required load, and guaranteed to be fully up to the sustaining capacity represented. The price of these Girders is ABOUT ONE-HALF the price of those of same length and same sustaining capacity in common use in this city. The value of this invention has been most favorably commented on in full by most of the scientific press of this country, as the SCIENTIFIC PRESS, *Scientific American*, *Railway Review*, *The California Architect and Building Review*, *The American Architect and Builder*. A Girder 25 feet long, made for 17-inch wall, with about 2 feet of brick wall on it, is now in front of premises 231 First St., above Shot Tower. This Girder held on the top of the brick wall now on it, 117 Tons and 1,741 Pounds of Railroad Iron, at the Pacific Rolling Mills, piled directly over and between supports, and it would have held, in the opinion of experts 200 tons, as the deflection was not a quarter of an inch below the true arc. The foundation on which the Girder rested, settled 7 inches, so that the loading had to be stopped at the above weight.

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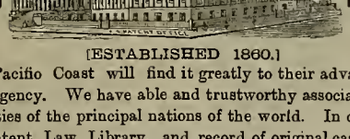
Scientific Press  Patent Agency.

[ESTABLISHED 1860.]

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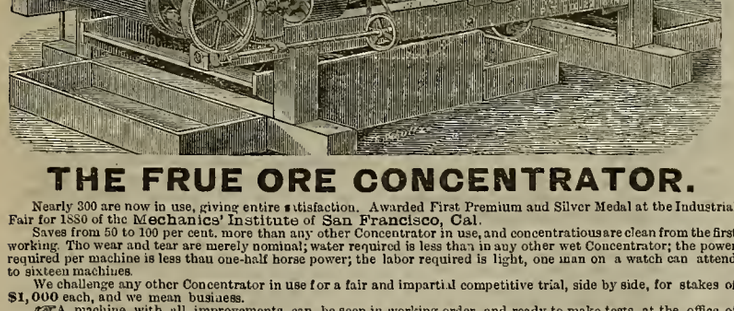

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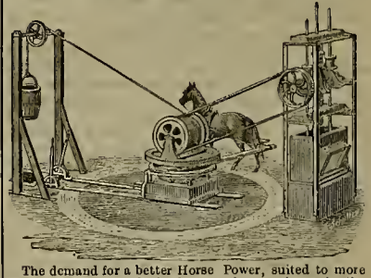
New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.

This power is light and strong, so that two or more horses can be used for crushing ore or other work.

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THIS WEEK ENDING NOVEMBER 8, 1881.

249,300.—CABLE-WAY—H. Casebolt, S. F.
249 303.—CHIMNEY—L. E. Clawson, S F.
249,185.—PANTS AND OVERALLS—Felix Kivi, S. F.
249 186.—SHIRTS—Felix Kivi, S. F.
249,187.—OVERALLS—Felix Kivi, S. F.
249,195.—FAUCET FOR SOIPPINO CANS—John Marshall, S. F.
249,262.—TELEPHONE EXCHANOE SYSTEM AND APPARATUS THEREFOR—John I Sabin, S. F.
249,207 – VELOCIPEDE—Budd Smith, S. F.
249,275.—DRYING NITRATES—Thos. Varney, Oakland, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

CHIMNEYS.—L. E. Clawson, S. F. Dated, Nov. 8, 1881. No. 249,308. This invention relates to certain improvements in chimneys of that class in which an interior flue is employed for the purpose of conducting away the smoke and gases, and an exterior casing may surround the interior flue, either with or without a filling between the two of plaster of paris or fire clay, for the purpose of safety. It consists in building a chimney in sections of earthenware tube, which are supported upon a suitable base provided with a slide, through which any accumulations may be removed from time to time, and in combination with such a sectional chimney a series of flanges so constructed as to unite the sections and at the same time provide independent supports for the chimney at intervals.

HORSE POWER.—Chas. H. Baker, S. F. Dated, Nov. 1, 1881. No. 248,906. This invention consists in a horizontal drum revolved by a vertical gear wheel, engaging with gear crown-plate, the latter being operated by an extended lever or tongue, which is connected with or disconnected from said crown-plate by means of certain devices operated by a lever. It also consists in certain details of construction, together with a braking mechanism, by which the drum may be prevented from slipping back or stopped when necessary. The object is to provide a horse power for lifting purposes, or for driving machinery, or for both combined, as when used to hoist ore from a mine, and at the same time operate a stamp mill.

THE LABORING MINERS.—The "laboring miners" are but poorly understood by many people in the State. Certain papers have spread the belief that these miners are a sort of half civilized, wicked and ignorant set of men, who neither know nor respect the law. Now, we have no doubt that the miners, as a class, know much more about the legal points now involved and yet to arise in the elickens contest than do the average business men of Marysville or Sacramento, who are equally interested in the result. Furthermore, these miners do not for a moment demand that any other industry shall be sacrificed that they may continue to exist. They know that there are measures within reach by the adoption of which they will be enabled to continue their own labors without further injury to their neighbors in the valleys. They are determined that these measures shall be carried into effect. It is no matter of guess work with them. If they cannot bring the grangers to a reasonable way of thinking in one way, they must do it in another. They make no statements, neither do they commit any acts that are not "justified by the situation," for they are too well posted to do that. Their ideas of what is justifiable in this connection may not accord with the views of the granger lawyers and press, but that makes no difference. Like Davy Crockett, they know they're right, and they propose to go ahead as they have begun.—*Nevada Transcript.*

THE first piece of gold found in California weighed 50 cents and the second $5. Since that time one nugget worth $43,000. two $21,000, one $10,000, two $8,000, one $6,500, four $5,000, 12 worth from $2,000 to $4,000, and 18 from $1,000 to $2,000 have been found and recorded in the history of the State. In addition to the above, numberless nuggets worth from $100 to $500 are mentioned in the annals of California gold mining during the last 30 years.

THE country surrounding San Andreas for several miles in extent contains very valuable mineral land; placer grounds have been merely gophered out here and there in wet winters, and will probably remain idle for some time until sufficient water is brought for working purposes. Quite a number of quartz mines in the vicinity are being worked in a profitable manner.

Practical Lectures to Mechanics.

(CONTINUED FROM PAGE 337.)

To store up and retain the water after it is expanded into steam, a strong vessel, called a boiler, is required, and all the heat that is imparted to the water has to pass through the plates of this boiler, which stand as a wall between the heat and its work.

Now, what I will ask, would be the use of studying proportions, the laws of expansion, combustion, and so on, until these concrete facts had been learned?

In Respect to Water Wheels,

Which rank second among motive agents, the same remark holds good. I fear you will think I am making war on text hooks, but I am not—only trying to show their scope or place—their subordinance to concrete facts. You all know the classification of water wheels in common rudimentary text hooks. The overshot, undershot and breast wheel; with perhaps some mention of the turbine and reaction wheels. Such classification does not lead to correct conclusions; does not, in this language of the report quoted, form a basis for the reasoning processes. Water wheels should be classed as follows:

First—Gravity wheels, acting directly from the weight of the water which is loaded upon a wheel revolving in a vertical plane, the weight resting upon the descending side until the water has reached the lowest point, where it is discharged.

Second—Impact wheels, driven by the force of spouting water that expends its percussive force or momentum against the vanes tangental to the course of rotation, and at a right angle to the face of the vanes or floats.

Third—Reaction wheels, that are "enclosed," as it is termed, and filled with water, which is allowed to escape under pressure through tangental orifices, the propelling force being derived from the unbalanced pressure within the wheel, or from the reaction due to the weight and force of the water thrown off from the periphery.

Fourth—Pressure wheels, acting in every respect upon the principle of a rotary steam engine, except in the differences that arise from operating with an elastic and a non-elastic fluid; the pressure of water reeting continually against the vanes and "abutment," without means of escape except by the rotation of the wheel.

Going a little farther with this matter and referring to turbine wheels, these are the subject of the most abtruse computations. These computations are essential; they furnish proportions, curves, capacity and so on, but below all this lies the concrete facts again. To illustrate I will name the main ones:

First—The spouting force of water is theoretically equal to ite gravity.

Second—The percussive force of spouting water can be fully utilized if its motion ie altogether arrested by the vanes of a wheel.

Third.—The force of the water is greatest by its striking against planes at right angles to its course.

Fourth—Any force resulting from water rebounding from the vanes parallel to their face, or at any angle not reverse to the motion of the wheel, is lost.

Fifth—This rebounding action becomes less as the column of water projected upon the wheel are increased in number and diminished in size.

Sixth—To meet the conditions of rotation in the wheel, and to facilitate the escape of the water without dragging, after it has expended its force upon the vanes, the reverend curves of the turbine is the best known arrangement.

This matter of concrete facts ie eo important that I do not like to leave it, even if thie evening's lecture does not reach turning, drilling, planing, forging and so on.

Power, or force and motion, ie a

Product of Heat.

That seeme a strange fact, but it is true in the fullest sense.

All motive machinery euch as steam engines, gas engines, air enginee, water wheele and wind wheels, are simply agente for utilizing or transforming heat into work. This you will find fully explained in the book before referred to.

This "concrete fact" which I want to call your attention to is, that all these agents or mechanics act upon the same general principle, that of expansion.

Force and Expansion.

The pressure or power of a steam boiler is due to expansion; that is obvious. In water power we utilize the gravity of the water as it passes from a higher to a lower level, but if we consider how the water reached this higher level, it will be found a result of expaneion. The heat of the sun's rays converts water to mist, expands it in fact, until it is lighter than air when it ascends, becomes condensed again and descende as rain, turning water wheels in its course to lower levels. In respect to wind power, the expansion of air hy heat is the main, or, indeed, the sole cause of wind currents, as it is of water currents. The sun, then, becomes the prime mover, so to speak, manifesting itself in curious but regular sequence. The heat employed for expanding water in steam boilers is from coal, and this coal, to use a remark of Prof. Rankin, is condensed rays of the sun—ie heat given out thousands, or, perhaps, millions, of years ago, and stored up in the earth for our present use.

[The remainder of Mr. Richards' lecture, which we shall give next week, is on machinery of application, in which he describes at some length the operations of forging, steam hammers, combined machines, etc.—EDS. PRESS.]

Thanksgiving Day.

The Governor's Proclamation.

STATE OF CALIFORNIA,
EXECUTIVE DEPARTMENT.

In accordance with the proclamation of the President of the United States, and in accord with the time-honored custom, now grown into a national observance, I, George C. Perkins, Governor of California, by the authority in me vested, do proclaim Thursday, the 24th day of November, as a day of thanksgiving, and request that it be set apart as a day of prayer to Almighty God in acknowledgment for the manifold blessings he has bestowed upon us as a nation. Following the example of our ancestors, let it also be a day for interchange of friendly greetings, family reunions and social recreations.

The past year has been overshadowed by a great national sorrow. The hand of the assassin has deprived us of our Chief Executive, our hearts have been overcharged with grief, mourning has draped our land in gloom, the nations of the earth, living under governments adverse to the principles which are the strength and support of our beloved land, have paid a tribute to the departed President unequaled in the annals of history. Peacefully has his chair been filled. No commotion, no violence, no discontent marks the change. The permanency and stability of our political institutions are established beyond a doubt, and the nation has proven itself composed of a conservative law-abiding people. While partaking of home pleasures and participating in family enjoyments, forget not those who are denied the privilege of both home and family. Extend the helping hand; yield to the stranger and wanderer the sympathy of your hearts; let kindness, and mercy and good-will to one another be the marked characteristics of Thanksgiving Day.

I would especially invoke the aid of the people of this State in behalf of the Veteran's Home Association of California—this day having been set apart by the Executive Committee of said association for such free-will offerings as our people may deem proper to donate. To the extent of your ability contribute to this worthy cause. Remember that the blessings which are ours this day came through them periling life and limb to keep this nation one and indivisible. It is not charity they ask, but justice. We owe it to them—it is an obligation, the fulfilment of which has been already too long delayed. I know this appeal will not be in vain—for the liberality and patriotism of Californians are never lacking when it is demonstrated that the exercise of those virtues are necessary for the aiding of a worthy and noble purpose.

In testimony whereof, I have hereunto set my hand and caused the Great Seal of the State to be affixed at Sacramento, California, this fourteenth day of November, A. D. eighteen hundred and eighty-one.

God save the commonwealth.

[SEAL.] GEORGE C. PERKINS, Governor.

By the Governor:
D. M. BURNS, Secretary of State.

Brief Mining Notes.

COLORADO'S bullion output this year will probably be about $23,000,000.

IT IS proposed to work ore worth $5 per ton, at a profit, in the Black Hills.

AIR pipes have been extended to the lower levels of the Con. Imperial, and work is about to be fully resumed at all points.

FOUR or five companies in Como are still diligently pegging away at their mines. The perseverance of the Comoites deserves to be well rewarded.

O. W. EASTON, a "49er," and well known in mining circles, died last week. He was lately directing mining operations on the Mariposa estate.

THEY have put a hydraulic gravel elevator at work in the river bed of the Middle fork of the American river near Hoosier bar, and it is said to be doing good work.

THERE is said to be a mountain of copper ore in the White Cloud mines, near Lovelock, Nev., and it is situated in the heaviest belt of nut-pine timber in the State.

THE proprietors of the smelting works, near Shell Mound park, have found it necessary, on account of the recent rush of business, to build a large addition to their works.

UPWARDS of $1,000,000 in gold was received by the last Australian steamer, all of which was in sovereigns, except about $125,000 This gold has all gone to the San Francisco Mint.

AS an indication of the change in the center of mining business, during the last six months $2,602,750 were paid in dividends in San Francisco, and $2,461,500 in New York and Boston.

A LARGE number of white men will go to the Yakitat country, Alaska, in the early spring to prospect. All the indications are that valuable discoveries will be made. Gold placers are looked for.

BESIDES doing a good deal of prospecting here at home, residents of Comstocke are sinking shafts, running tunnels and otherwise prospecting about a dozen gravel mines in various parts of California.

THE numerous friends of Judge C. C. Goodwin, formerly of the Virginia *Enterprise*, now editor of the Salt Lake *Tribune*, will be pleased to learn that he has become wealthy through a lucky mining investment.

AT Butte, Mon., there are four smelters in operation, and another in course of construction. There are six roasting mills running, and a large one building. The Alice and Moulton are the big mines of the camp.

IN alluding to the fact that the new gold mines of New York are found near Saratoga, the Grass Valley *Tidings* says it seems a wise provision in nature when it is considered how people who visit there are charged.

News in Brief.

BODIE has not over 3,000 inhabitants at present.

IT IS reported on good authority that the relations between Mexico and Guatemala are very critical.

DURING the last fiscal year there were 10,871,943 acres of Montana land sold and granted to railroads.

TWO passenger coaches of the Colorado Central train were Saturday blown from the track, near Colorado.

THE United States steamer *Alliance* has arrived at New York after five months' fruitless search for the *Jeannette*.

THE narrow gauge railroad from Bodie to Mono lake is completed. It is 30 miles in length.

GOULD'S Southwestern system will within a few days have connection with the Southern Pacific by the New Orleans branch through Shreveport, La.

DIPHTHERIA, scarlet fever and small-pox are devastating the center and south of Russia. The severity of the diseases exceeds anything heretofore known.

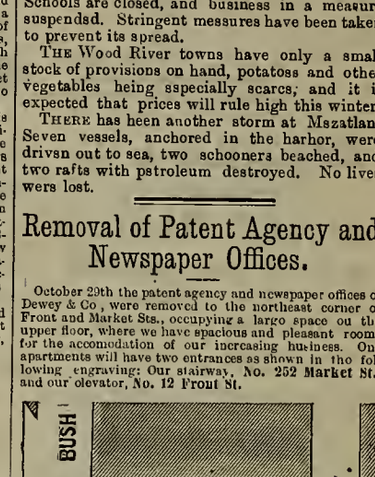
SMALLPOX still rages in Dayton, W. T. Schools are closed, and business in a measure suspended. Stringent measures have been taken to prevent its spread.

THE Wood River towns have only a small stock of provisions on hand, potatoes and other vegetables being especially scarce, and it is expected that prices will rule high this winter.

THERE has been another storm at Mazatlan. Seven vessels, anchored in the harbor, were driven out to sea, two schooners beached, and two rafts with petroleum destroyed. No lives were lost.

Removal of Patent Agency and Newspaper Offices.

On October 29th the patent agency and newspaper offices of Dewey & Co, were removed to the northeast corner of Front and Market Sts., occupying a large space on the upper floor, where we have spacious and pleasant rooms for the accomodation of our increasing business. Our apartments will have two entrances as shown in the following engraving: Our stairway, No. 252 Market St., and our elevator, No. 12 Front St.



☞ Take the Elevator at No. 12 Front St.

Visitors will find it better to step around the corner from Market St., to the elevator rather than ascend the stairs. Old and new friends are cordially invited to give us an early call in our new quarters.

The Mining and Scientific Press

Established May, 1860, this has long been the leading mining journal in America, and enjoys a large circulation among the more intelligent operators and workers in the gold fields of the world.

As a scientific and mechanical representative of the Pacific Coast, it is decidedly popular and a standard journal with the most thrifty industrial people of the Pacific States and Territories. Its authority is of the highest order, and its usefulness in its special sphere unrivaled.

Every public library, mining engineer, metallurgist, mining operator and intelligent mechanic and manufacturer will find profit by its reading.

Subscription, $4 a year in advance. Sample copies, 10 cts.

DEWEY & CO., PUBLISHERS,
No. 202 Sansome St., cor. of Pine, S. F.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

O. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
E. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—San Mateo and Santa Clara counties.
C. E. WETMORE—Alameda county.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired), be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

BOOKSELLERS, STATIONERS, ETC.—Messrs. Peyot, Upham & Co., No. 204 Sansome Street, are one of the oldest, most enterprising and reliable firms in the book and stationery trade in San Francisco. Scientific, industrial and foreign publications are a specialty with them. They are also noted for their first quality of blank book and fine stationery line of goods.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

San Francisco Metal Market.

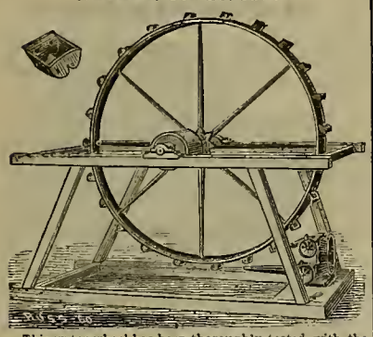
[WHOLESALE.
WEDNESDAY, November 16, 1881.

IRON—	
American, Pig, soft, ton	— @30 00
Scotch, Pig, ton	25 50 @27 50
American White Pig, ton	— @— —
Oregon Pig, ton	— @— —
Clipper Gap, No. 1	— @26 00
Clipper Gap, White	— @30 00
Clipper Gap Car Wheel	— @33 00
Refined Bar	4 @ 7¼
Horse Shoes, keg	— @ 5 50
Nail Rod	— @ 7¼
Norway, according to thickness	6½@ 7½
STEEL—	
English Cast, lb	13 @ 15
Black Diamond, ordinary sizes	— @ 15
Drill	15 @ 16
Flat Bar	16 @ 18
COPPER—	
Ingot	— @ 22
Sheet	— @ 20
Sheating, Tinned 14x13	— @ 31
Nails	— @ —
Bolts	— @ 33
Old	— @ —
Bar	— @ 22
Cement, 100 fine	— @ 15¼
LEAD—	
Pig	— @ 5
Bar	— @ 6
Pipe	— @ 8
Sheet	— @ 9
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES—	
10x14 I C Charcoal	— @ 7 50
10x14 I C Coke	6 15 @ 6 40
Banca Tin	— @22 50
Australian	— @23 50
I. C. Charcoal Roofing 14x20	— @ 6 90
ZINC—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS—	
Assorted Sizes	4 00 @ 4 15
QUICKSILVER—	
By the flask	40 @ 41
Flasks, new	— @ 1 23
Flasks, old	— @ 1 05

THE PELTON

WATER WHEEL.

(Patented, Oct. 26, 1880.)



This water wheel has been thoroughly tested with the Dynamometer, and utilizes 78% of the theoretical pow r; and underheads of water of 75 to 800 ft ie guaranteed to give better satisfaction than any Turbino or other wheel ever offered to the public. The above per cent, is due to the peculiar shape of the buckets used. They do not reduce the water to a spray, but divide and deflect it outward and backward, in such a manner that a part of the impact and the whole reactionary force are utilized, without any part of the water coming in contact with the bucket following. Furthermore, the per cent. of efficiency remains constant through great variations in the amount of water used. These buckets can be taken off in transportation, and can be replaced by new ones when worn out by sand in the water; also can be applied to wooden wheels when desired.

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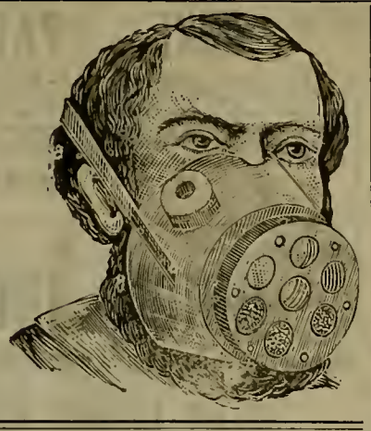

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Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

REGULAR DIVIDEND NOTICE.

OFFICE OF

Northern Belle Mill and Mining Company,

SAN FRANCISCO, CAL., NOVEMBER, 10, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 56), of fifty cents (50 cents) per share, was declared, payable on Tuesday, November 15, 1881. Transfer books closed on Friday, November 11, 1881, at 3 o'clock P. M.

WM WILLIS, Sec'y.

Office—Room No. 20 Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF

Northern Belle Mill and Mining Company,

SAN FRANCISCO, CAL., NOVEMBER, 10, 1881.

At a meeting of the Board of Directors of the above-named Company, held this day, an extra dividend [(No. 57), of twenty-five cents (25 cents) per share, was declared, payable on Tuesday, November 15, 1881. Transfer books closed on Friday, November 11, 1881, at 3 o'clock, P. M,

WM. WILLIS, Sec'y.

Office—Room No. 20 Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company,

SAN FRANCISCO, NOVEMSER 8, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 23) of Twenty-five Cents (25c) per share was declared, payable on TUESDAY, November 15th, 1881, at the office of the Company, Room 10, No. 328 Montgomery street, San Francisco, California. Transfer books will be closed on November 9th, 1881, at 3 P. M.

JOSEPH NASH, Sec'y.

Newcastle Gold Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Yankee Hill Mining District, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Twenty-third (23) day of September, 1881, an assessment, (No. 2) of two (2) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 33, No. 318 Pine St., San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the First (1) day of November, 1881, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Twenty-first (21) day of November, 1881, to pay the delinquent assessment, together with costs of advertising and expenses of sale,

E. G. MATHEWS, Sec'y,

Office—Room 33, No. 318 Pine St. San Francisco, Cal.

POSTPONEMENT. — The day of delinquency of the above assessment is hereby postponed to the fifteenth day (15) of November, 1881, and the day of sale to Monday the fifth day (5) of December, 1881. By order of the Board of Directors, November 2, 1881.

E. G. MATHEWS, Sec'y.

Newcastle Gold Mining Company.—Location of principal place of business, San Francisco, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the twenty-third day (23) of September, 1881, the several amounts set opposite the names of the respective stockholders as follows:

Names.	No. of Cert.	No. Shares	Amt
O. C. Marsh, Trustee	41	1000	$ 20 00
C. C. Marsh, Trustee	42	4000	80 00
C. O. Marsh, Trustee	44	300	6 00
A. B. Grogan, Trustee	45	12500 bal.	210 00
G. P. Thurston, Trustee	46	12500 bal.	230 00
G. P. Thurston, Trustee	48	10000	200 00
G. P. Thurston, Trustee	49	10000	200 00
G. P. Thurston, Trustee	50	5000	100 00
G. P. Thurston, Trustee	52	3500	70 00

And in accordance with law, and on an order of the Board of Directors, made on the second day (2) of November, 1881, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the Company, Room 33, No. 318 Pine Street, San Francisco, California, on Monday, the fifth day (5) of December, 1881, at the hour of four o'clock P. M., of said day, to pay said delinquent assessment thereon, together with the cost of advertising and expenses of sale.

E. G. MATHEWS, Sec'y.

Office, Room 33, No. 318 Pine St., San Francisco, Cal.

REMOVAL NOTICE.

The Sweepstake Plow Company's Works have been removed to

Benicia from San Leandro.

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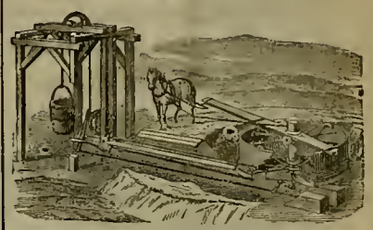

MINERS' HORSE-POWER.

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MINING ENGINEERS,
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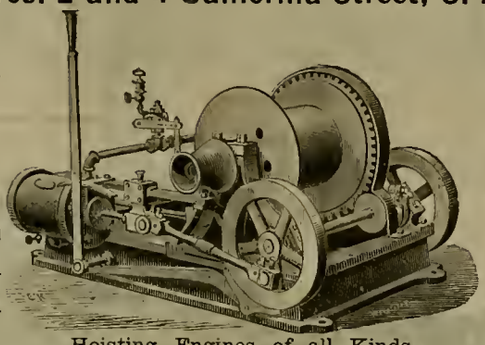

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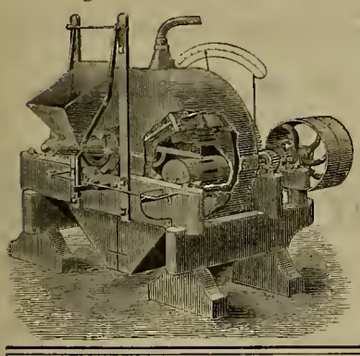

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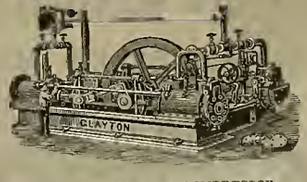

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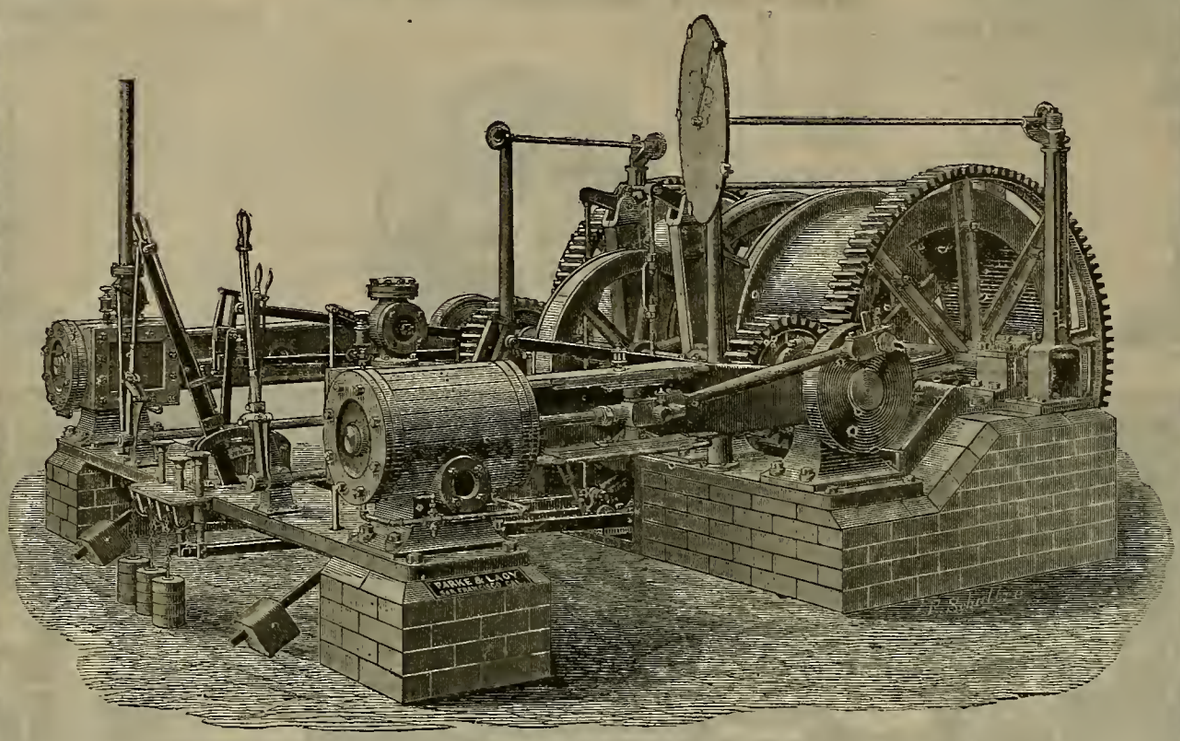

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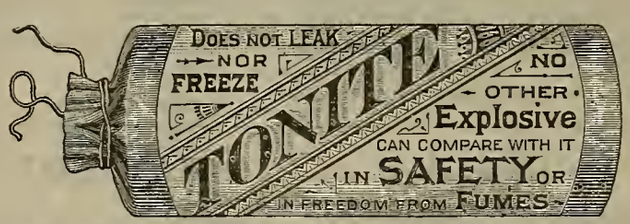

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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

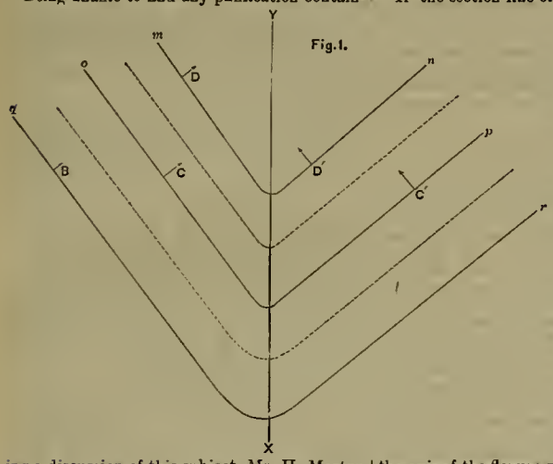
SAN FRANCISCO, SATURDAY, NOVEMBER 26, 1881.

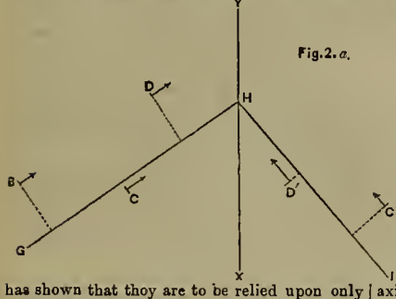
VOLUME XLIII Number 22

Construction of Geological Cross Sections.

In some of our technical schools and colleges the student is required to construct or copy a number of profile sections of his routine work; but little attention is given to the methods of projecting observed dips and exposures upon the section line, and still less to the method of constructing the under (or above) ground curves. As a result of this instruction every engineer or geologist is compelled to invent for himself a system, or copy the style of others.

Being unable to find any publication containing a discussion of this subject, Mr. H. Martyn Chance, Assistant Geologist of the Pennsylvania from data obtained at the surface, but the experience of engineers in the anthracite coal fields has shown that they are to be relied upon only in exceptional instances.





The possibility of indicating underground survey, prepared a paper on the subject of "The Construction of Geological Cross Sections," which was read before the American Institute of Mining Engineers, as follows:

Geological profile sections have frequently been used to determine underground structure curvatures from dip angles observed at the surface has been found to be limited to a mere approximation of the larger flexures. As a means of predicting the depth and shape of minor rolls, they have been found most unsatisfactory. In the anthracite coal fields, the hypothecated structure in undeveloped ground is usually introduced upon the working profiles in pencil lines only, and as development progresses, frequent changes are necessitated by the eccentricities of individual seams.

I wish to invite attention to the methods commonly used in the construction of cross sections, and to indicate some of the reasons why these must always fail to give trustworthy results.

We may consider these points under three heads:

1. The location of the section line.
2. The projection of dips and exposures.
3. The construction of underground curves.

Having given a series of exposures and dip angles located geographically upon a map, the best position for a section is generally conceded to be along a line drawn midway between these exposures and at right angles to the line of strike, *i. e.*, parallel to the direction of the dip.

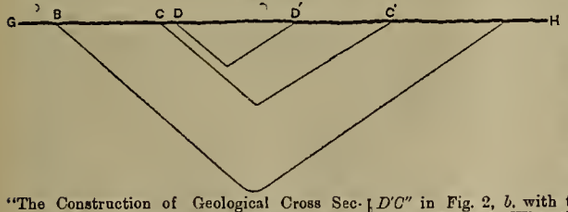
If the section line cross is an anticlinal or synclinal axis decidedly inclined to the horizon—that is, when the opposing dips are not parallel and the lines of strike on opposite sides of the axis converge—the section may often be best located along a broken line, the lengths of which are drawn at right angles to the local strike; or it may be constructed on a line drawn at right angles to the axis, when this bisects the flexure; or on a line drawn at right angles to a line bisecting the angle formed by the converging strike lines.

Thus in Fig. 1, three coal beds, *B*, *C*, *D*, are exposed at the points, *B*, *C*, *D*, and *D'C'*, dipping as indicated by the arrows; the line *XY* is the axis of the flexure, rapidly declining towards *Y*. The lines *mn*, *op*, *qr*, are water-level contours, drawn through the different seams, representing, therefore, their "line of strike." The dotted lines are introduced to show the method of locating hypothecated horizons.

The best methods of constructing a section through these exposures is illustrated by *Fig.* 2, *a* and *b*, in which the section line, *GHI*, is a broken line, the segments of which, drawn parallel to the opposing dip-angles, intersect on *XY*.

The resulting section shows the absolute thickness of the strata between *B* and *C*, and between *C* and *D*, and the agreement between the thickness *DC''* with that determined at *D'C''* furnishes a good check on the accuracy of the construction.

Two very objectionable methods are shown by Fig. 3, *a*, *b* and *c*. The section line GH is drawn at right angles to the axis, XY, and midway between the located exposures. The first section, Fig. 3, *b*, is obtained by projecting the dip-angles upon the section line, *in prolongation of the line of strike*. This is the only proper way of projecting exposures, and will always give a section mathematically correct for the adopted alignment, but the thickness of measures as represented by the section is much greater than the true thickness. This can be seen by comparing *D'C''* in Fig. 2, *b*, with the same line in the section, Fig. 3, *b*. When this method is adopted, a prominent "N. B." should always direct attention to this exaggeration.



The section, Fig. 3, *c*, shows the absurd construction that results if the dip-angles are projected at right angles to the section line.

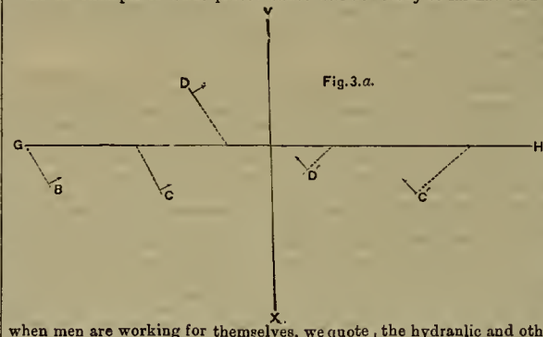
Difficulties in the identification of coal seams on opposite sides of a basin may frequently arise from distortions of this kind.

THREE more of Capt. Williams' Alaska exploring party returned the other day from that region. The *Turner* picked them up at St. Michaels, some ten days before the *Corwin* rescued the four members of the party who returned on the cutter some weeks since.

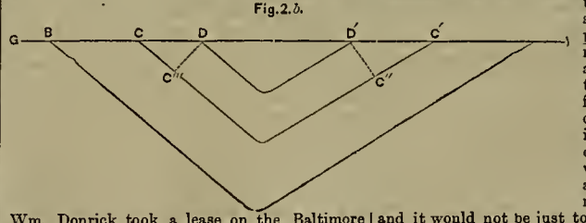
Working Mines on Lease.

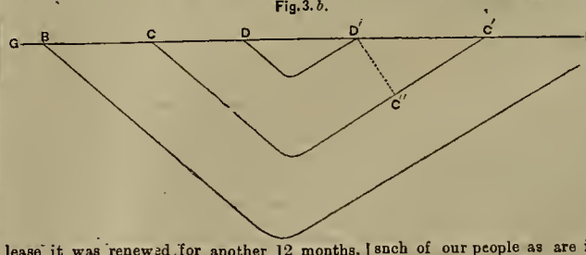
Leasing of mines by practical miners from the owners has, until lately, been a thing almost unknown on this coast; but now whole mines, or portions of them, are leased to gangs or companies of working miners, who make more or less, according to the ore. When work of this kind is properly superintended, it is often a good thing for both parties, for the mine is properly opened and developed for the miners, while the miners, working for themselves, put in their best licks.

As an example of what perseverance will do when men are working for themselves, we quote an item from the Georgetown *Courier* of Colorado, which, referring to the Baltimore tunnel, says:



Two years ago John Pomeroy, John Foote, Wm. Foote, Thos. Foote, Thos. Bonds and Wm. Donrick took a lease on the Baltimore tunnel for one year, having the ground from the tunnel level to the surface. They commenced drifting without ore, and had none for the first 100 ft, but since that time the ore has been continuous. On the termination of the lease it was renewed for another 12 months, which will expire with the present month. During the two years they have made from $200 to $225 per month to each man. The highest amount reached in any one month was $640 to the man. The output has been remarkable for its regularity. They have run the drift between 300 and 400 ft., and stoped it mostly to the surface.





A contract was let last week to drive the tunnel 200 ft. at $22 a ft. It is now in between 600 and 700 ft.

CAPITALISTS must learn that they must go underground several hundred feet to work to good advantage. A correspondent sensibly says: A company of men who are so close and near-sighted as to pay $100,000 for a mine, and then refuse to go down any further than they can reach with a 200-ft. windlass rope ought to lose the mine and all they put into it.

The Gold Run Suit.

The case of the People vs. The Gold Run Ditch and Mining Co. is on trial at Sacramento. The case is watched with interest all over the State. As judging from the character of the evidence, it is evidently intended to go over the whole question of the debris. From the evidence already presented by the prosecution, it would appear as if weeks of time are to be consumed in the hearing of testimony, and the whole history relating to the mining deposits in the American river fully investigated. The testimony so far has been for the purpose of showing the depth of the deposit in and about the month of the American, and to prove overflow and damage to the town of Washington and adjacent country as this consequence.

The Grass Valley *Union* of the 20th says in this connection: The prosecution doubtless has an object in having the testimony so elaborate on this point, but the defence will be willing to concede that the filling of the American river is due largely to the hydraulic and other mining carried on upon the main river and its tributaries. They can properly deny, however, that they are responsible for that deposit or any damage resulting from it. The Gold Run Co. may have contributed something to this river deposit, but that is hardly susceptible of the proof that is necessary to obtain a permanent injunction. The debris from the Gold Run claim that escapes into the tributaries of the American would make scarcely a showing at the month of the river, and it would not be just to make the company responsible for what is the combined result of the twenty years mining of all kinds in a large part of the two counties of Placer and El Dorado. The prosecution is going over a wide field to make its point against the Gold Run Company, but so far it is not evident that they have shown any ground for the permanent injunction demanded.

COPPER IN THE EAST.—Judging from the following paragraph from the Boston *Economist*, such of our people as are interested in copper mines need not fear to go ahead and develop their properties, as there appears to be no danger of causing copper to become a drug in the market: "The copper mining interest continues to grow in importance, and the prices of ingots are well maintained. Lake Superior loses none of its importance in the market consequent upon developments in other sections, and we look forward to increased demand at steady prices. Sales at 18 afford a profit, and stimulate the working of increased forces in all copper districts."

THE Calaveras *Chronicle*, a journal which is so well managed as to pay more than ordinary attention to local affairs, and one in which we always find something worthy of reproduction, has entered on its 31st volume.

CAYUGAS is the principal headquarters town, of Safford district, Nev.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Ede

The Revolution.

EDITORS PRESS:—We have had already many revolutions in metallurgy—on paper; hut now comes something more serious, accnrding to an article in the New York *Times* of Octoher 12th. It is the Hamilton lead amalgamation procees, to which you have referred in the PRESS. The *Times* eays that the obstinacy of the tailings from the quicksilver amalgamation, to retain 40% of the silver aud gold of the ore, is now completely overcome.

For the Hamilton process, tbe ore is first pulverized, then roasted; after this amalgamated with lead in a red hot state, and finally the lead, saturated with silver and gold, treated either hy the zinc process or hy crystallization. All this ie performed with the cost of $1 per ton, or even less. So it is printed hlack on white. Works are already in erection in New York capahle of treating 100 tons per day, having one "magnificent" rotary desulphurizing cylinder furnace—7 ft. in diameter and 52 ft. long—fed automatically, "with far more regularity than if fed hy hand." There are four connecting dust chambere, catching any of the ore that might escape up through the stack hy the strong hlast. The furnace is lined with fire bricks, with projecting shelves on the inside. It is also halanced nicely; "one man can easily rotate it hy hand." That of course means when empty; a volume of gas heing injected hy a Root's hlower, which eliminates the gaseous, ohnoxious vapors, and is carried out through the chimney stack into the outer air.

From the roasting furnace tbe ore is conveyed into a vacuum furnace and passed through a hath of molten lead. This piece of machinery is a marvel of wonder. The ore hy euction ie taken through 30 tons of molten lead, wherehy each and every particle of precious metal comes in contact automatically with the said molten lead. The lead in running into the pipe creates a suction that conveys the ore with it, and, dropping through the cast iron pipe, mingles freely with the gold and silver. The lead and ore rise in the pot, hut that the extraction may he complete, and "the alloy not permitted to adhere to the gold and silver," a numher of riffled plates are attached to the stand pipe of the pot. The lead is kept in continual circulation until it is fully charged with the precious metal, absorhing one-fifth of its weight in gold and silver.

"Hundreds of carloads of ore are from all parts of the country on the way awaiting the etarting of the works. A prominent Comstock operator offsred $100,000 for the right of one county alone in Nevada, the offer heing promptly and ahsolutely refused." Serves him rigbt. Why did he not offer two millions! The shares are sold now at premium.

To convince non-helievers, the *Times* gives the followiug parallsl to show the similarity and difference between amalgamation by quicksilver and lead.

QUICKSILVER OR CHEMICAL AMALGAMATION.	LEAD OR METALLURGICAL AMALGAMATION.
"1. The ore is reduced to a pulp with a mixture with water."	"1. The ore is ground fine in a dry state."
I should like to know where the ore is ground wet for roasting.	
"2. The ore is submitted to chemical treatment in the cold."	"2. The ore is roasted at high temperature."
So far as I know, the ore is roasted at a proper temperature for quicksilver amalgamation.	
"3. The mercury is mixed thoroughly with the ore previously chemically treated."	"3. The pulverized ore previously heated is thoroughly mixed with the molten lead."
"4. The mixing is done mechanically."	"4. The mixing is done automatically."
There is a similarity here.	
"5. Amalgamation takes place in the cold."	"5. Amalgamation takes place at red heat."
Nobody amalgamates here cold.	
"6. Mercury is a metal fluid at ordinary temperature, and is an expensive metal."	"6. Lead is a metal, solid at ordinary temperature, and one of the cheapest metals."
Mercury is fluid, lead is solid; that is true	
"7. Amalgamation by quicksilver is a long process and tedious, and always in complete operation. Meanwhile much of the precious metals, as well as the mercury is lost, both chemically and mechanically."	"7. Amalgamation by lead is instantaneous. Very little lead is lost chemically; none mechanically. Much lead is gained in treating some ores and none of the gold or silver can escape, no matter how fine or light the particles may be."

No. 7 is written for greenhorns exclusively. The question is not whether the amalgamation is instantaneous or not, hut how long will it take to get the silver bullion in hand. Roasting takes the same time in hoth cases. The amalgamation with quicksilver takes six hours, retorting again, six; melting, two hours, and the bar is ready. This is good for 3 tons or 100, according to the number and size of pans. The amalgamation with lead naturally must he conducted in a large amount of lead, and the separation of 30 tons of lead from precious metals hy zinc or cupelation is a "long and tedious operation," and the har will not be in hand before 48 houre, if at all. How 100 tons of ore can pass through a hath of lead without causing a mechanical lose is certainly a "marvelous wonder," as well as that no particle of gold or silver can escape. A proper roasting and amalgamation in pans is turning out the silver and gold within 90% generally, often 96%; and if the Hamilton process can do the same at a cost of $1 or 75 cents per ton, then it will he time for our foundries to hurn up their patterns nf amalgamating machinery, hut there is no danger in that direction. K.

San Francieco, Nov. 17, 1881.

Silver Canyon.

A week or so ago we made a hasty trip to this promising little camp. It is situated nn the east elope of the Schell Creek range, pretty well up in the mountain. As yet thcre is hut little business outeide of that carried on hy Dr. Brooks' company. Through the courtesy of foreman Mickel, we were then taken through the principal mines of the company and shown the work that is heing prosecuted under his management. At the Sadie L. a great deal of work hae heen done and considerable high-grade ore taken out. All the indications in this mine point to yet undeveloped ore hodies of great value at greater depth. The Blue Bslle, several hundred ft. higher up, aleo looks well, and has some very rich ore in sight. Infact, a large scope of ground in that section, most of which is tho property of the company, gives unmistekable proofs of heing richly mineralized. All that is nesded is time and lahor to hring out the latsnt resources of the dietrict. The compauy give employment to hetween 40 and 50 men at the mines and mill. The mill ie of 10 stamps cepacity, almost new, and gives perfect satisfactiou. There ie an ahundance of pine timher adjacent to the mines and mill to supply the camp for years to coms. The canyon is possessed of all the resources to hring out one of the hest mining districts in this section.

There is one store, kept hy Gerraghan & Poujade, one saloon hy Jas. McNulty, and Mr. and Mre. Sommerlott conduct the two boarding-houses at the mines and mill. J L. Roherts o), an old-time pioneer of Treasure Hill, runs the motive power at the mill as well as Uncle Sam's postal affairs. A small log schoolhouee, sufficient for present demands has heen built.—*White Pine News.*

"FLOAT" MINERS.—Down in Mud Springe township (and perhaps in other parte of the county), there are men and boys, quite a number of them, who make a comfortahle euhsistences, and occasionally quite a "strike," in exploriug ravines, croppings and old piles of tailings for "float" (detached chunks of quartz) of promising appearance, wbich they pile up in little heaps at convenient points until a few tons are gathered together, when they hire a teamster to haul it to some neighboring quartz mill, where an agreed price per ton is paid for crushing it. Col. Staples, at the Pocohontas mill, does this description of crushing at $6 per ton. The price for hauling ranges from 75 cents to $2 per ton. In some instances "float" hunters, after paying for hauling and crushing, have heen known to realize from $8 to $12 for their lahor, hut it is generally practiced hy hoys who are satisfied if, for the odd hours throughout the summer which are thus employed, they realizs enough to "keep even" on hilliards, cigars, etc., through the winter. In some cases, however, of experts in quartz and its manipulatiou, fair wages are made in selecting "float," pounding it up in a hand mortar, and panning it out. One gentlemen of good standing and repute, a rancher of Mud Springs township, assured us that during one winter he had made upwards of $700 in this manner, working at this business only on euch days as could not he profitably employed in connection with his business of farming. He ehowed us a pile of "float," estimated to contain hetween three and four tons, from which he expec'e to take out not less than $150 during the rainy days of next winter.—*Mountain Democrat.*

A NEW MINING DITCH.—The Yreka Creek Mining company are hurrying along the work of getting ready for winter. A hulkhead, or wing-dam, some 1,400 ft. long, is being constructed. The new elevator lately received is also heing placed in position, and the other one is to be moved as soon as the new one is ready for work to keep the pit clear of water. In addition to this work, arrangements are heing made for the construction of a ditch immediately to carry the water of Forest House creek to the reservoir, and also to enlarge the ditch ahove the reservoir to Guy's gulch and Cram's gulch, also to enlarge the ditch from the reservoir to Hawkinsville, so as to furnieh 1,360 inches of water, which will keep two elevators in operation during the next four months. By the end of this time the upper ditch will he enlarged all the way to Shasta river, to keep up the supply when the watei is scarce in tbe creeks and gulches nearest the reservoir.—*Yreka Journal.*

THE turning in of a sufficient amount of cold water to work the hydraulic pump should, to a noticeahle extent, the *Enterprise* thinks, cool the water in the Sutro tunnel. Ae the temperature of the water and air is being regularly taken at the mouth of the tunnel and several other points, we shall he able to learu exactly what difference the cold water makes as soon as they commence using it.

THE Oswego Iron Works are reported sold to the Oregon Railway and Navigation Company, together with a large amount of real estate, comprising timher land, etc. Villard proposes to erect rolling mills, to give additional facilities for turning out iron.

The Prospects at Tombstone.

The Tombstone *Epitaph* says: When one statee that the outlook for the permanent prosperity of Tombstone is hetter now than ever, the question naturally arises as to the whys and wherefores. We answer: First, hecause the greater development of the mines, upon which all business is based. In Contention, there has been developed above the 600 level, ore sufficient to keep 40 stamps in steady operation for three years. This we have upon the authority of the managers of the mine. The result of the recent compromiee with tbe Flora Morrison has heen to decide the company to build a 40-stamp mill at the mine. This one fact is sufficient to give an assurance of increased prosperity to all branches of husiness.

In the Tombstone company's mines, there is now developed hodies of ore that aggregate 35,000 tons, from which the stockholders may reasonahly expect another million dollars in dividends. This development ie confined to thres of their eleven mines. When they shall see fit to open up the remaining eight, all of which show unmistakahle evidence of richness, there is no computing the amount of wealth in store for the fortunats owners.

Grand Central is proving itself a veritable Pactolus, from which streams of wealth flow forth in copious ahundance to make glad the enterprising men who have laid broad and deep the foundation for future successful workinge. Girard, with its 20-stamp mill rapidly assuming form, at our very doors, whose stamps will make music on or ahout the first of January, is and other element of proeperity. The Vizina will soon he in a positiou to augment her present very respectahle monthly output, and Ingersoll, with the $200,000 piled upon ite dump, and which is heing added to at the rate of $1,000 per day, a lds other sources of dependence. Then there is Head Center, Sulphuret, Tranquility and Stonewall, that are not to be omitted in this count, with Wedge, Prompter, Anchor, Emerald, Grand Central South, Grand Dipper, Green Cloud, Winfield, Old Guard, and scores of othere rapidly coming on, to augment the productive mines of an area of two miles square immediately adjacent to the city.

To add to the value of thsse developments and bring the reduction works home to our doors, is the increased water supply. In addition to the two companies already furnishing water through pipes, there is the Huachuca company, that will have its pipes laid and the water flowing at the rate of half a million gallons daily, eome time in January next, and the Sulphurct supply, which will bs ample, it is thought, to run the Girard and Contention mills and adjacent hoisting worke. This copious water supply is destined to play as important a part in the future greatness ae almost any one item.

Last, hut not least, will be the building the main line of the Atchison, Topeka & Santa Fe railroad directly through the city, which will give us the henefit of more and cheaper lumher, wood, coal, merchandise and provisions from the eastward, as well as attracting the business of northeastsrn Sonora, to our doors for its supplies. This is no fancy picture, hut one that can be verified to the satisfaction of any husiness man who will take the time and trouhle to investigate the snhject. Never in our knowledge did a place have a hrighter outlook than Tomhstone at this time.

Hite's Cove District.

The Hite Mine.

Tbe Hite mine is showing up first-class below the 900 level. The vein in the hottom of the new two-compartment shaft, which is heing sunk from the ahove level, is of good size and very high grade. The work at this point of the mine has not heen progressing very rapidly, ae all hoisting is done hy hand. As soon as the new turhine wheel arrives, which is to furnish the power for the air compreseor, rock drills and hoisting works, the shaft will he put down as rapidly as powder and compressed air can do it. The new mill ie kept running night and day. The old mill is undergoing considerahle repaire, and will soon be in fine running order, when we shall expect to hear of some fine clean-ups.

The South Hite Mine.

We learn that the ore hody on the 200 and 300 levele of the South Hite mine is showing up splendidly, the vein heing from two to four ft. in width, and of good grade and character. They are now driving the 500 level west into the Spring tunnel claim, where little or no prospecting has heen done, although the croppings show good ore.

Ferguson Lode.

We learn from correepondents that things look very favorahle at this mine. Work appears to he progressing in a manner that indicates something big after a while.

Simpson and Gordon Lode.

The Simpson & Gordon mine, on Sweetwater, is progressing rapidly, with good prospects.—*Mariposa Herald.*

WE see hy the Wood River *Miner* tbat prospectors are swarming ahout the towns along the river and offering their claims at very low figures for cash. Many of them wish to leave for home or a warmer climate, and others will winter here. It takes cash to keep them until the prospecting field is again open, and this is why they will part with their prospects at reasonahle figures.

Concentrations.

THE Brush dam on Bsar river was evidently set on fire.

THE water coming out of the Sutro Tunnel has a temperature of 120°.

MILLS and mines off the railroad are now getting in supplies of wood for the winter.

THE hoiler of the Empire quartz mill hlew up the other day killing the mill hoss James McGregor.

IT is claimed that there is a mountain of copper and iron ore in the district east of Loveland's station, Nevada, which has not yet heen much prospected.

WM. B. HYDE, formerly connected with the C. P. R. R., hut lately manager of the Gen. Custer mines, Idaho, has returned to his home in Oakland.

THE little water mills on Gold canyon, from Gold Hill downward, are gradually resuming work. Most of these reduce ores taken out of small mines in Devil's Gate district.

BULLION to the amount of $462,412.27 was shipped from Tombstone during the month of Octoher. Since April this district has added $2,741,673 49 to the wealth of the country.

THE Tombstone *Epitaph's* mining report shows that the Grand Central mine, for six monthe' run of the mill, has turned out $848,176 in hnllion, from working 18,000 tons of ore.

C. H. JONES, of El Dorado county, died last week. Mr. Jones was for many yeare tbe superintendent of construction and general agent of the California water snd mining company, and its predecessor, the California water company.

THE Eureka Con., Nevada, pays its "trihuters" $2 on $30 oro, and 50% on all ore assaying ahove that sum at the chutes. There are prohably more men engaged in trihuting on the Hill than ever hefore.

THE consolidation of two of the heaviest mining enterprises in New Mexico hae just heen effected in Las Vegas. The properties thus confederated are the Socorro and Mille tunnels in the Socorro mountain.

THE Clipper Gap iron mine is temporarily closed dowu, owing to the want of sufficient coal with wbich to run it. Wheu the kilns now in process of constructiou are completed, there will he 26 in all.

THE only difficulty in the matter of saving the valleys and the hydraulic mining industry is the cost of proper dams. Millions of money can he profitably and economically devoted to this purpose hy the State or nation.

A VEIN of mineral hss heen discovered in Ontonagon county, Wisconsin, on the survey of the Wisconsin, Lake Shore and Western Railway, which aseays 60 % of lead and 15 ozs. of silver to the tou. It will he developed hy Boston and Milwaukee capitalists.

EIGHT hars of hullion, valued at $9,870.20, have been received at Wells, Fargo & Co's offics at Winnemucca from Idaho. Three of the hars, valued at $2,881.54. from the Monarch mine, at Atlanta, were shipped East, and the rest were shipped to San Francisco.

THE Wood River *Miner* warne etrangers against that class of prospectore who have failed to locate any mineral bsaring claims, in order to make a etake for the winter will resort to all sorte of suhterfuges; for this class ie plenty now that winter is coming ou.

WHILE John Treanor, driving one of Seeley's teame, was hauling 100 kege of powder to a mine at Badger hill, Nevada county, a hridge gave away, and the whole outfit was precipitated into the cut. One of the six horses was killed, and Treanor hadly hurt.

MR. G. D. DOUGLAS, agent for the Hecla & Calumet Copper Co., Lake Superior, is at present in Arizona Territory examining the copper interests and gathering statistics relative to present and prospective supply of copper hullion from Arizona and New Mexico.

AT the present time, Enterprise, Great Gulch district, Fresno county, hae a population of ehout 150. New-comere arrive every day, and should the present mining hoom continue, this section of Fresno county is destined in the near future to he one of the livliest in the State.

THE *Herald* says Phœnix, Arizona, is to have a 100-stamp quartz mill built upon the Phœnix mine, near that town. It is expected that shipments of hullion aggregating $75,000 or $80,000 will he made monthly when the mill is completed. The mine is free gold quartz, in slate.

THE bed of Prairie creek recently hroke through into one of the mines of the Chicago, Wilmington & Vermillion Coal Co., in Illinois. The hole thus made is about 200x400 ft. Only four men were in the mine when the hreak occurred, and all of them escaped. The loss to the company is estimated at $100,000.

SAYS the Santa Barbara *Press:* From the oil region of the Santa Clara valley we have news of great activity in that product. Work is active, and drillers command $4 per day. New wells are going down in many directions, and there is increased development, excitement and confidence on all sides.

BY the new arrangement of air pipes, the clearing out of leading drifts and other improvements that have been made in the California and Con. Virginia mines, in connection with the suction fan at the old Con. Virginia shaft, the ventilation is heing wonderfully improved. Already the lower levels are quite comfortahle.

MECHANICAL PROGRESS.

Painting of Cement and Plaster.

Much difference of opiuion prevails respectiag the queetion of paiatiag Portland comont, aad we have eeen work painted a few weeke after the cemeat has set, which has stood well. There is oae poiat which hae a great deal to do with the question of succcssful painting, namely, the absorbency and dryness of the brickwork itself. Many aew walle, saturated with moisture, are comented, and in thie condition no paint can possibly stend if laid ou too soon. It ie a good and safo rule to enforce that Portland cement work should not bo peiated within a year of its oompletion, to allow it to dry thoroughly; but we are safo ia sayiug the majority of new froats are painted hefore they have hoen fiuished threo months. A very desirahle prceeution seems to be to coat the work with linseed oil first.

The painting of plaster work requiros the same care, and the lime works out in small huhbles, destroying thopaint. In painting plaster, white lead and linseed oil, with a little drier, ie recommended hy onc authority. This coat should be of the coasistenco of thin cream, eo thet the oil is ahsorhed into the pleeter in a few hours. In a day or two another thicker coat may ho applied, and a third a few days after, rather thicker, followed hy the haiehiag coat. Foar coats are not too much for good work. By the absorption of the oil into the plaster the surface becomes hardened, and mey ba washed. Aaother method to facilitate this aheorption is followed by paintere, which is to give the plaster two or three ooats of boiliag linseed oil, and thea to apply the other coats of peint. We are incliaed to think the application of the oil hefore the paint a hetter plaa, to iasure a thorough eaturation of the material. The color of Portland cement, and the uaeven tint it sometimes aesumes, is the main reason why paiating is resorted to. For this reason we thiak it may he worth the attention of manufacturers to turn their coasideration to the enbject, and those usiag cemeat ae a stucco might also prevent a hlotchy end uneven tint by attendiag to the preparation of the wall and the sand they use with the cement.—*Building News.*

THE "LONDON" GAS ENGINE.—The popularity of the gas eagine, great as it undoubtedly is already, will, we think, he greatly extended by the introduction of the engiue now being manufactured under Hutchinson's patent hy the London Gas Engine Co. The design and arragements are quite new and original. An oval shaped iron casing of considerahle thicknees, cast in one piece with the cylinder, conceals the piston-rod, connecting rod and crank from view, and while imparting to the engine great firmnces and steadiness, prevents the riek of accideat. Regularity in working ie also attained by the employment of a specially heavy fly-wheel. All parts of the "London" engine are constructed to gauge, and are therefore interchangeahlo and easy of adjustment. The working parts are few in number, and are made of berdened eteel so as to secure the utmost durability and emoothnese of motion. Thc coneumption of gas ielow, and can he regulated with great nicety according to tbe load on the engine. A two-man power engine, working at full power, consumes, on the average, three farthing's worth of gas per hour. Coal, petroleum, atmospheric, or water gas can he ueed equally well. A turn or two of the flywbecl hy hand will set the engiue going, and a hoy or lahorer can attend to it. It is, moreover, very compact and portable. The one-man engine, for instance, occupiee a floor epece of two ft. four inchee by one ft. 10 inchee, and etande three ft. 11 inches high, and weighs four and one-half cwt.—*Ironmonger.*

BRAIN POWER AND MACHINE WORK.—The day of hrute force in the machine shop hae gone hy. The entire operations to-day are more of the hrain than of the muscle, and since some ono must furnieh tho braiu work, it is a pertinent question for the individual machiuist whether he shall educate himself to supply the larger part of it, *and get paid for it*, or whether on the other hand he ehall put himeelf nearer the level of the mechine he operatee, and allow some one elee to get paid for thiaking. This is a matter the mechanic has to eettle for himeelf. —*American Machinist.*

RESISTANCE OF STEEL TO FRACTURE.—Experiments have frequently heeu made, and numherless speculatione have heen indulged in, with referenco to the iafluence of temperature on the reeietance of steel to fracture. The *Moniteur Industriel* states that the chief ceuse of variation in strength is the preeence of sulphur; eteel or iron containing no su phur maintain the eame hreakiog strain at all observed temperatures, the only change being a trifling variation of the limit of elasticity.

TO DETECT A FLAW IN IRON.—If a piece of iron appears to have an unsound weld, or if it hae a crack apparent upon the eurface and it ie desirous to know how deep it penetrates, heat the part to be teeted to a red heat and pour a hoe etream of water on the faulty spot, but mainly on one eide of it, and the iron on that eide will lose its redness more rapidly than the other side, and plainly indicate how deeply the defect extende.

The Bursting of Saws.

When tho shaft nf the Cunard etcamship *Catalonia* recently broke, aad the vessel wae nbliged to retnrn to New York for repairs, tho captain was interviewed, and asked to give an explanation of the cause of the accident. He could, says the *Northwestern Lumberman*, give nn reasou for it. Mr. Roach, the enperintendent of the iron works where tho shaft was made, was also iaterviewed, and tho conversation led to a generel discussion of the lasting qualities of irnn. Mr. Roach said that iron had its time of usefulnoss juet as men and horses have. That time completed, the iron must be born agein. as ie were.

Railroad mea uaderstaad this law, and know how much weight their froight care will carry, aad estimato how meny milee they will run hefore the wheels aad axles will give out. When the shafte run ont their natural livee, they are thrown aside, though there may he no vieihle defect in them.

Iron has a way of crystalizing in tbe process of time, and often when a piece of it breake, one can find no flaw in the material—no apparent reason for its giving away. It has hcen held hy engineers and scientiste that a constaat vibration of iron disintegretes it, the infirmity becoming pervasive throughout the mass of metel. For this reaeon iron bridges have beea supposed to have a limit of endurance and eafety, and it hes heen predicted that the time will come when the Niagara suspension bridge, hy reason of the constant vihration caused hy paseing traias, will outlast ite cohesive iategrity, and suddenly go down, probably while a weight of valuahle life is passiag over it.

Thie mortality in iron snd eteel, under vihratory influence, may account for tbe bursting of circular saws, which often cauees sad hevoc of life and limb in mills. The intense vibration of the dizzy steel, by reasou of its long use, at last hriags the inevitahle weakuess, and it suddenly flies in pieces. If sawyers could arrive at some definite knowledge ae to the life of a circular saw, as the railroad men do as to the endurance of axlee and wheels, many serious accidents might he avoided.

A NEW WRIST PIN OILER.—For yeare American mechanics have heen showiag their ingenuity in devisiag lahor and capital saving machiaery. The succees that has heen met with by them is truly marvelous, and is plainly discernible hy their use in the differeat manufactures of thie country. Among the prominent and late achievements in the field of invention is Jewel's patent automatic wrist pin oiler. This device is ueed for oiling crank pine, guides, conaectiag rods and pillow hlocks of eteam engines, and is placed on the market hy Messrs. Fairhanks, Morse & Co., Chicago, who claim for it easy application to any style or make of engines; that it is simply positive in any place where attached, effectinga saving of from 75% to 90% of the oil used by an oiler heretofore placed on the market. That it is impossible for a hearing to heat or wear where it ie used, as the oil is forced in regular quantities at regular intervale to the part or point required. It is a well known fact that all engineers are required to use oil in abundance on the main heariogs of their engines, and should they he called away hy other dutiee their oiling ie a eource of anxiety until their return. These oilere relieve an engineer'e mind from all anxiety on theee points, ae the bearings are oiled regularly and no more oil is delivered than ie necessary to keep them properly lubricated. They can he adjueted in a moment to feed fast or slow, and the uniformity of feed is equally positive in otber casee.

FINE DRILLING.—Prof. Edward C. Pickering, of Herverd College, says that in undertaking to measure the intensity of the light of the eatellites of Mars he had occasion to need an extremely small hole. Among the artieans who eseayed to furnish what was required was one who had succeeded in making a hole edgewise through an old fashioned three-cent piece, and and another who had pierced a needle through from end to eud. A hole about the 25-100 part of an inch in diameter was finally eecured.

TREATMENT OF NEW FILES.—A new file should be ueed with a light preseure until the very thin sharp edgee are worn off, after which a heavier preseure may he ueed with much less danger of the teeth crumbling at the top or hreakiog off at the hase. Every filer ehould keep a partially worn file to use first on chilled eurfacee or gritty ekin of castings, or on a weld where horax or eimilar flukes have heen employed, or on the glazed eurface of sawe after gumming.

IRON RAILWAY SLEEPERS.—Spanish papere are at present etrongly arguing in favor of the iutroduction of iron and eteel eleopere for railways. The wooden eleepere employed there now are obtained from foreign couutries, while those of iron and eteel could he manufactured in Spain. The *Gaceta Industreal* estimatee the probahle demand for the first 10 yeare to be 500,000 tone, the manufacture of which would yield an income of 20,000,000 france.

RED ANTS.—The judicioue ueo of oil of turpentine will effectually exterminate red ante. It may he injected into cracke and crevicee in cloeete and elsewhere from an ordinary sewing machine oil can.

SCIENTIFIC PROGRESS.

Molecular Attraction.

F. D. Brown, B. Sc., in a recent scientific paper, says: That if we regard chemical affinity as neutralized hy tbe nuion of two elements, we aro then nuahle to acoount for the reactions takiag place between moleculee, and involviag an interaction of atoms composing different molecules. If, however, the act of combination he regarded ae producing no change in the chemicel forces, aad it he euppoeed that the same attraction is exerted between any given pair of atoms witbout regard to the state of combination of one or hoth of the atoms, then a reasonahle account can be given of chemical reactions, and the existence of molecular combinations does not appear very remarkahle. Further, we are provided with a more or lees effective explanation of the relative volatility of subetaaces. Reasoning from this point of view, and coasideriag the carhon compounds specielly, the author concludes that intermolecular attraction ehould he greater in an acid than in a corresponding alcohol; greater in an alcohol of high molecular weight than in a homologue of which the molecule is less complex; greater in a primery alcobol than in the secondary or tertiery ieomeride; and finally, greeter in a chlorinated compound than in the correspondiag eubstaace containing hydrogen. If the volatility of a suhstance he a measure of the forces of attractioa hetween the molecules, then it muet he admitted that the hoiling points of organic compouads show with some reaeon that the ahove expression represents the value of intermolecular attrection. From this point of view the etudy of the latent heat of many carhon compounds would materially aid us in the eolution of the prohlem of chemical affinity.

The Nature of Coal.

Meesrs. C. F. Cross and E. J. Bevaa, says the *Journal of Gas Lighting*, have recently been carrying on a chemical research iato the nature and method of the formation of coal. They treated jute fiher with sulphuric acid at 70°, and ohtaioed an insoluble, hlack, epongy suhstance. This formation is in some way hased on cellulose and dextriu. The productions of thie epoagy substance is uenally of a destructive character, attended with the evolution of carhonic acid and the formation of ecetic acid. A study of the chemical properties of the suhstance has led the above named observere to the conclusion that lignin is derived from cellulose by chemical modification. A remarkable circumstance in connection with tbe phyeical nature of the hlack euhstance in question is that it dries to a hard mass, reeemhling cannel coal, with which it has heen compared, and similar results of chlorination and nitration have been ohtained. This evidence goes in further support of the opinion that coal is not carbonaceous in any more special sense than alcohol, hut ie rather, as supposed hy Balzer, composed of a eeries of C, O, H, N hodies, which are geneticelly if not homologouely related. It is suggested that cellulose, lignite, peat, coal and authracite are terms of an infinite series specialized hy the conditione of their formation.

THE CYCLE OF THE SEASONS.—Different men of science in England hold different opinions in regard to what ie called "the cycle of the eeaeons." E. J. Lowe said, in 1879: "There can he no reasonable douht that a cycle of eeasone exiets, though its precise period has yet to he aecertained. A lengthened inveetigation has, however, eatisfied me that the cycle is ahout 11 years. Thus, every 11 years drouth and heat are experienced, uenally of three yeare' duration —that is to say, the drouth recurring in three coneecutive summere." And in the same year, Mr. Roe, F. R. A. S., broached a theory cloeely resembling Mr. Lowe'e. G. T. Ryves, F. M. S., now calls attention to the fact that the last three summere, which, according to the theory, should bave heen hot and very dry, have, on the contrary, heen cold aud wet, and from thie he drawe the conclusion that at heet euch predictions are hut scientific gueeses, and when put forth as propheciee they are not only sure, in many casee, to disappoint those who put faith in them, hut are apt to create a false impreeeion in the puhlic mind as to what is attainable in the present etate of meteorological science. On the whole, it eeems that any such predictions, no matter who makee them, are not a whit more likely to be verified than if Mr. Venner had made them.

THE LIGHT OF THE STARS.—For a numher of years the epecial work carried on at the Harvard observatory, under the direction of Prof. Pickering, has been the meaeurement of the intensity of the light of the heavenly hodies. Some of the reeulte presented at a recent meeting of the Society of Arte, at the Institute of Technology, Boston, indicate measurements almoet incredibly finc. The light which falle upon the earth from tho eatellites of Mare, for example, is ahout equivalent to what a man'e hand on which the eun ehone at Washington would reflect to Boston. The lahor of measuring the hrightneee of all the visihle etare wae hegun two years ago. It hae eince gone on at the rate of about 40,000 a year, and will he completed next fall.

Climate and Altitude.

Tho Virginia City *Enterprise* (Nevada) furnishes the following: "The relatione of climate to altitude are very intimete, but in most regions are not apparent—that ie, not visihle to tho eye. Hero, however, it is different. For instaace, yesterday (Novemher 15th) while all tho hills and mountains round about were arrayed in robes of dazzling white there was in the center of the eastern landscape one hig spot of brown. This was on the Carson river, down toward Fort Churchill. There not only tho valley lend, but also all the low borderiag hills remaiaed a deep and deeolate hrowa. It was like a dirty spot left in the middle of a newly whitewashed wall. Although this epot is at no great distaace from this city the people thero walk about oa hare ground, while here we wade in a foot of enow. With them it is only late autumn; with us it is genuine winter. However, they have not far to go to get a taste of winter Half a mile from their homes would take moet of them up intn the saow belt.

Persons who have lived all their livee in prairie and other level regions have but an indistinct notion of the great influence altitude has upon climate. When their plaias are hare, they do not know that winter is often but 100 ft. above their heads.

In this mountaiaous region we have an excellent opportunity of etudying the effects of altitude. It ie sometimes quite wonderful to observe the eveaness of the snow line. It ie drawn midway up the face of the whole line of hills as neatly as though marked with a chalkline. Sometimes it is higher, sometimes it is lower, owing to the temperature. The evenness depeads a great deal upon the air. When there is much wind the snow line is not well defined, hut when it is calm the strata of the atmosphere are perfectly regular. The snow line is then as level as though it were the water line of a lake.

Frequently, when no snow lies on our etreets, we can see on the slope of Mt. Davidson, only 200 or 300 ft. above us, the line separating us from the region of winter.

A Beautiful Sight.

The same paper, as above quoted, givee the followiag under the head of "Snow Streamers:" "The peak of Mt. Davidson last evening presented a moet wild and wiatry appearance. The snow streamere were ahroed in all their glory. Last eveniag, however, they could hardly he called streamere. They were in reality an unending series of whirlwinds that chased each other aloag the crest of the mountain. The epiral columns of snow took a thousaad shapes in forming and vanishing. Being etrongly lighted hy the setting eua, the great eurgiag columns looked like whirls of flame and illuminated emoke rolling up from a great fire. This hrilliancy was seen in places where the rays of the sun passed through the thin mist of a single snow whirl. In placee where three of four columns happened for a moment to fall in line hetween the spectator and the sun, the whole was black as the smoke from the funnel of a steamhoat. Frequently eeveral of the colors of tho rainhow would flash out around these dark columns, and a moment after all above tbe peak would he deep red, giving the top of the mountain the appearance of an active volcano. It would have heen a fine opportunity for a scientist interested in the study of atmospheric currente. The motions of these snow whirls show us what is alwaye taking place in the air at the top of the mountain, hoth winter and summer, and if on our mountain, doubtless on all mountains of like hight. The straight current of the atmoephere ie hroken up into thousande of little whirlwinds that riee from 50 to 200 ft. ahove the eurface of the ground.

PREVENTING WATER FROM FREEZING IN HYDRAULIC APPARATUS.—The growing uee of hydraulic machinery for riveting, flanging, etc., in our iron worke, and for elevators, hoisting machinery, cranes, etc., mekes the question of avoiding the danger incideut to the freezing of water in the pipee an important one. The *Engineer* statee that in Eogland there is no generally adopted method. An admixture of methylated epirits, salt or glycerine has heen tried, and Mr. Tweddell, well known in connection with hydraulic machinery, made some experiments on the effect of the addition of glycerine. In open vessels, at a temperature of 28°, when pure water froze rapidly, only a lump of rotten icewas formed when 1% of glycerine was present, less still with 2%, the ico formed not being sufficiently solid to flow, eepecially with a preesure of 1,500 lbs. per square inch. One firm found that in addiug one gallon of glycerine to 300 gallons of water no trouble whatever was experienced, while another firm usee 25%, although they helieve 10% to be enough for ordinary purposes. Salt ie much cheaper, hut while glyceriue rather preeerves leather packings than otherwise, common ealt destroye them, especially wheu in cast iron.

AN OBSERVATORY FOR BOSTON.—Mr. Miller, Preeident of the Atlantic Iron Works, Bostou, with eeveral other gentlemen, have determined on the erection in that city of au iron observatory, which, it is eaid, will he the highest structure in the United States. The models, plane, etc., have all heen completed. The etructure will he built of the heet iron adapted for euch a purpose, and its general appearance will he both ornamental and imposing, at the eame time combining safety and comfort.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Nov. 3.		Week Ending Nov. 10.		Week Ending Nov. 17.		Week Ending Nov. 25.	
Alpha	4	3⅜	3.95	3.80	3.55	3⅛	....	....
Alta	4.35	4	5¼	4¼	4.80	4¼	4.80	4.15
Andes	1.60	1.45	1.60	....	1.60	1½	1.35	1
Albion	2½	2	2.40	1.55	2.40	1.85	2	1 90
Argenta	10c	....	....	....	....	....	10c	....
Addenda	10c	5c	10c	....	10c	....	5c	....
Belcher	2.85	2.80	3⅝	2.85	3.35	3.05	3	2.15
Belmont	60c	55c	60c	....	....	....	30c	....
Best & Belcher	12½	11⅝	12	11½	11⅝	9⅛	9⅜	8⅜
Bullion	1.95	1.70	1.80	1.60	1.65	1⅛	1¼	1¼
Bechtel	55c	50c	60c	50c	55c	....	50c	45c
Bello Isle	....	....	....	....	20c	....	15c	10c
Bodie	7	6¼	6¼	5	7⅞	5⅝	5¼	4¼
Benton	75c	65c	90c	70c	95c	75c	90c	....
Bulwer	2.20	2	2¼	....	....	....	....	....
Boston	....	....	25c	....	25c	....	....	....
Black Hawk	....	....	....	....	10c	....	5c	....
Belvidere	....	....	....	....	....	....	25c	....
Booker	....	....	....	....	....	....	....	....
Caledonia	45c	15c	40c	35c	35c	25c	35c	25c
California	80c	75c	75c	70c	75c	65c	65c	45c
Challenge	70c	....	85c	80c	70c	....	7c	....
Chollar	2¼	2	3.15	2	3	1.70	1.65	1.45
Confidence	3.65	3.35	3.95	....	3.10	3	3.10	2
Con Imperial	30c	....	20c	....	20c	15c	15c	10c
Con Virginia	2.40	2¼	2.35	2.25	2.30	2.15	2.10	1.85
Crown Point	2¼	1.85	2¼	1.95	2.10	1¾	1.85	1¼
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1¼	....	....	....	1¼	....	1¼	1.05
Concordia [Val.	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	20c	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2.30	2	1.95	1.80	1.90	1.85	1.90	....
E. Mt. Diablo	40c	30c	35c	....	35c	30c	40c	25c
Eureka Con	18	16¾	17¼	16¼	17¼	16¾	17	17
Exchequer	1¼	1.35	1.40	1.35	1.40	1¼	1¼	1
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	....	....	....	....	2½	....	2½	2½
Goodshaw	35c	30c	35c	....	50c	35c	50c	45c
Gould & Curry	7¼	6¾	7	6¾	7	5¾	5¾	5¾
Hale & Norcross	3.10	2.95	3.60	2.95	3.55	3	3.05	2.70
Head Center	30c	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	15c	....	....	....
Julia	45c	40c	40c	30c	30c	....	25c	15c
Justice	1	85c	1.05	90c	1	85c	85c	65c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2½	....	2½	....	2½	....	2½	2
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	15c	....	20c	....	15c	....	15c	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	1	....	....	....	....	....	1½	75c
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1½	....	1¾	1½	2	....	2	1.90
Martin White	....	....	3½	....	3	....	2	....
McClinton	....	....	....	....	....	....	....	....
Mono	1¼	1¼	2.35	1¾	2½	2	1.80	1.35
Mexican	8⅜	8	9½	8⅜	9¼	8	7⅞	7
Mt. Diablo	7⅜	8½	6¾	6	5⅞	....	6¼	5⅜
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	50c	40c	40c	35c	35c	30c	40c	25c
New York	10c	....	15c	10c	20c	....	....	....
Northern Belle	12⅜	11⅞	14¼	12⅜	13¾	12¼	12½	10½
North Noonday	25c	20c	10c	....	10c	....	10c	5c
Navajo	40c	....	....	....	....	....	....	....
Occidental	1¼	....	1¼	1.10	1¼	1	1.35	1.05
Ophir	7⅛	5⅝	7⅞	7	7⅞	6¾	6⅝	6
Original Keystone	....	....	....	....	....	....	....	....
Overman	2.60	2.30	2.65	2.40	2.90	2.45	2.65	1¾
Oro	35c	30c	35c	30c	35c	25c	20c	....
Paris	....	....	....	....	....	....	....	....
Potosi	2.70	2.45	2¼	1.85	1.95	1.70	1.55	1.45
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	10c	....	10c	....	....	....
Savage	4	3.45	3.65	3.35	3½	2.85	3.15	2.80
Sep Belcher	8¾	....	8⅞	$	8⅝	7⅞	8	....
Sierra Nevada	14¾	14	16	13⅜	14⅝	11⅝	11⅝	9½
Silver Hill	30c	25c	25c	20c	25c	15c	20c	13c
Silver King	20	19½	19½	....	19½	....	20	19½
Succor	....	....	....	....	....	....	....	....
Summit	....	....	15c	10c	....	....	....	....
Scorpion	1.60	1¼	1.60	1⅜	1⅜	1.20	1.30	1.05
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	....	....	30c	20c	30c	25c	20c	20c
Tioga Con	25c	20c	25c	20c	25c	....	20c	10c
Tiptop	6¾	5¼	5¾	....	5¾	....	5¼	....
Tuscarora	....	....	....	....	....	....	20c	....
Union Con	14⅜	13¾	13⅞	12	13¼	10⅞	11	9¼
Utah	7⅛	6¾	7	6¾	8¼	6¾	7⅛	7
Ward	3	....	3	....	....	....	3	....
Wales	50c	....	....	....	75c	....	....	....
Yellow Jacket	4.35	3.80	5⅜	5¼	5¼	4.20	4.40	3.30

Sales at S. F. Stock Exchange.

Wed'sday A.M., Nov. 23.

60	Utah		7
375	Alta	4.15@4.20	
795	Union	9¼@9⅜	
300	Ward	3	
460	B & Belcher	8¼@8⅜	
530	Yellow Jacket	3.45@3.30	
630	Bullion	19	
	AFTERNOON SESSION.		
195	Albion	1.90	
100	Black Hawk	5c	
100	Belding	25c	
150	Bodie	4.70@4.65	
850	Bechtel	50@45c	
100	Concordia	1¼	
10	Eureka Con	17	
250	E Mt Diablo	40c	
50	Goodshaw	45c	
250	Holmes	30c	
400	Leeds	1⅛	
150	Mono	40@1.35	
30	Manhattan	1.90	
200	M White	2	
20	Mt Diablo	6¼	
100	Noonday	30c	
200	N Noonday	10@5c	
150	Northern Belle	10¼	
300	Oro	20c	
100	Pinal	3	
50	Tioga Con	15c	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Germania, Nov. 17th, $9,000; Hanauer, 17th, $2 640, Eureka, $1,000; Mammoth, 15th, $1,650; Barbee & Walker, 15th, $1,722; Great Basin, 15th, $2,610; Avon, 15th, $3,445; Germania, 16th, $6.600; Horn Silver, 16th, $10,000; Tintic, 16th, $3 593; Germania, 18th, $12 000; Jay Gould, 18th, $3,915; Horn Silver, 18th, $30,000; Barbee & Walker, 18th, $1.243; Stewart, 18th, $9,500; Horn Silver, 19th, $22,500; Mayflower, 19th, $7,785; Stormont, 19th, $2,490; Hananer, 20, $2.200; Horn Silver, 20, $1,500; Ophir, 19, $17,621; Day, 14, $4,400; Eureka, 10, $8,005; Leeds, 15, $1,600; Northern Belle, 14, $5,842; Northern Belle, 16, $6,386; Star, 14, $3,700; Wai Wera, 17, $3.464; Silver King, 16, $27.000; Christy, 18, $2,400; Bodie Con., 21, $6 035, Contention, 14, $16 374; North Belle Isle, 21, $6,000; Christy, 19, $2,166; Head Center, 21, $4,535; Ophir, 18, $17,621; Bodie Tunnel, 21, $3,000; Manhattan, 18, $38,331; Contention, 18, $15,803; Star, 18, $4.199; Christy, 21, $2,233; Northern Belle, 19, $8,461.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alexander M Co	Nevada	1	3 00	Oct 31	Dec 3	Dec 21	A B Cooper 323 Montgomery st
Belty O'Neal M Co	Nevada	2	25	Nov 14	Dec 19	Jan 5	R W Heath 318 Pine st
Belmont M Co	Nevada	30	15	Nov 11	Dec 19	Jan 16	J W Pew 310 Pine st
Black Hawk G M Co	California	13	10	Nov 9	Dec 17	Jan 4	H A Charles 419 California st
Bonanza M Co	Nevada	1	15	Oct 31	Dec 3	Dec 20	J B Treadwell 404 California st
Bodie Tunnel & M Co	California	5	50	Oct 23	Nov 24	Dec 21	C C Harvey 304 California st
California M Co	Nevada	2	10	Oct 4	Nov 9	Nov 30	E F Stone 306 Pine st
Grand Prize M Co	Nevada	7	25	Sept 30	Nov 1	Nov 21	E M Hall 327 Pine st
Hale & Norcross M Co	Nevada	71	50	Oct 6	Nov 9	Dec 1	J F Lightner Montgomery st
Holmes M Co	Nevada	3	10	Nov 8	Dec 12	Jan 3	E A Holmes 318 Pine st
Lord of Lorn M Co	Nevada	2	10	Oct 8	Nov 17	Dec 19	R N Van Brunt 318 Pine st
Mexican M Co	Nevada	17	1 00	Oct 4	Nov 8	Nov 28	C L McCoy 309 Montgomery st
Mono M Co	California	14	1 00	Oct 4	Nov 9	Nov 29	W H Lent 309 Montgomery st
Morning Star M Co	Nevada	1	25	Oct 13	Nov 22	Dec 21	J B Moholm 331 Montgomery st
Mt Potosi M Co	Nevada	8	25	Oct 20	Nov 21	Dec 12	W J Taylor 330 Pine st
North Noonday M Co	California	4	25	Oct 26	Dec 1	Dec 23	W J Taylor 330 Pine st
Noonday M Co	California	4	25	Oct 26	Nov 29	Dec 20	W J Taylor 330 Pine st
Overman S M Co	Nevada	51	50	Oct 17	Nov 17	Dec 8	G D Edwards 414 California st
Potosi M Co	Nevada	7	50	Nov 11	Dec 14	Jan 4	W E Dean 309 Montgomery st
Quartz Mountain M Co	California	13	75	Oct 7	Nov 14	Dec 5	E Hestris 729 Montgomery st
Savage M Co	Nevada	48	50	Nov 3	Dec 6	Dec 27	F B Holmes 329 Montgomery st
Sierra Nev S M Co	Nevada	70	1 00	Oct 6	Nov 10	Nov 29	E L Parker 309 Montgomery st
Tuscarora M & M Co	Nevada	9	15	Oct 17	Nov 24	Dec 14	M E Sperling 369 California st
Utah S M Co	Nevada	36	2 00	Oct 13	Nov 16	Dec 6	G C Pratt 369 Montgomery st
Union Con S M Co	Nevada	18	1 00	Oct 10	Nov 14	Dec 5	J M Buffington 309 Montgomery st
Yellow Jacket S M Co	Nevada	42	1 00	Oct 4	Nov 9	Dec 6	N Otey

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Buckeye M Co	California	4	50	Nov 10	Dec 19	Jan 19	W H Lowden 213 Sansome st
Belvidere M Co	California	12	25	Sept 22	Oct 29	Nov 21	C V Hubbard 310 Pine st
Benton Con Co	Nevada	6	25	Oct 14	Nov 18	Dec 8	W H Watson 302 Montgomery st
Franklin Gravel M Co	California	7	30	Oct 14	Nov 14	Dec 5	G R Spinney 310 Pine st
Goodshaw M Co	California	9	15	Oct 12	Nov 17	Dec 7	Chas C Harvey 309 Montgomery st
Golden Fleece Gr M Co	California	23	40 00	Oct 23	Nov 30	Dec 19	F Schinnier 785 Folsom st
Home G M Co	California	8	3	Oct 20	Dec 3	Dec 21	R Ellon 330 Pine st
Iowa M Co	Nevada	15	05	Nov 9	Dec 17	Jan 5	C C Leavett 411½ California st
May Flowsr Gr M Co	California	13	10	Oct 12	Nov 16	Dec 7	J Morizio 328 Montgomery st
Newcastle M Co	California	2	02	Sept 23	Nov 15	Dec 5	E G Mathews 318 Pine st
Rocky Point M Co	California	9	05	Oct 12	Nov 14	Dec 5	D M Kent 330 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Eintracht Gr M Co	California	H Kunz	209 Sansomo st	Annual	Dec 6

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	California	W Letts Oliver		20	Nov 19
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Sept 27
Father De Smet M Co	Dakota	H Dean	New York	50	Oct 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Nov 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Nov 15
Silver King M Co	Arizona	J Nash	315 California st	25	Nov 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Nov 12
Tip Top M Co	Arizona	H Dean	309 Montgomery st	20	Aug 25
Western M Co	California	C S Curtiss	309 Montgomery st	75	Nov 10

The Mining Share Market.

Stocks continue bad. In fact, it seems as if the loss of interest in them is, while gradual, so sure that they would drop out of sight altogether in time. Our tables show the variation in prices.

To show what work is being done on the Comstock, we take the following from the Gold Hills *News:*

Following is the whole number of men employed at the several north end mines, from the Con. Virginia on the south to the Utah on the north.

Utah—Miners, 24; surface men, 18; total, 42.

Sierra Nevada—Miners, 76; surface men, 14; total, 90.

Union shaft—Miners, 45; surface men, 61; total, 106,

Mexican—Miners, 39.

Union Con.—Miners, 63.

Ophir—Miners, 70; surface men, 19; total, 89.

California—Miners, 28; surface men, 1; total, 29.

C. & C. shaft—Surface men, 43.

Con. Virginia—Miners, 17; surface men, 3; total, 20.

The large number of surface men at the Union and C. & C. shafts is accounted for by the fact that they do the surface work for several mines, and it will be observed that some of the companies, as the Mexican, Union Con., etc., have no surface men. Among the surface men are included carpenters, blacksmiths, engineers, ordinary laborers, clerks, attorneys, etc. It is also probable that some of the so-called surface men, as attorneys, surveyors, etc., are counted over and over in going through the list of mines. However, all told, the several mines in the list foot up but 538 employees.

From this it will be seen that a vast deal of work is being done with very few men, the total number of those put down as miners being 362 men.

Thus, it will be seen that all the drifting, crosscutting, sinking of winzes, drilling, cutting of drains and many other kinds of underground work from the Con. Virginia northward, is being done by the small force of 362 men.

Stockholders have no reason to complain of extravagance in the way of employing workmen. When we consider the vast amount of underground work of all kinds that is daily and weekly accomplished by these 362 men, we can see that they do but very little "soldiering."

Frue Concentrators.—Four Frue concentrators have been sent to Mr. Grayson's Brown Bear mine, Trinity county. Tailings now go $1.50 per ton, the ore running $30. Henry Janin has also bought two for the Minas Nuevas Mining Co., near Alamos, Mexico. J. B. Haggin has sent four for the famous Joquistita mine, Mexico. The ore from this mine runs $300 per ton. L. Charronat has purchased two for a mine at Nevada City. Several of these concentrators have gone to Cherry Creek, Nev., to concentrate the refractory sulphurets of silver ore below the battery. The tailings containing the chloride then become free milling ore, the expense of dry crushing and roasting the whole mass being thereby saved.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Puget Sound Iron Co.—Nov. 19. Capital stock, $500,000. Object: To carry on the business of making, manufacturing or purchasing iron or steel or other metal in California, Washington Territory or British Columbia Directors—G. W. Prescott, J. H. Redington, J. A. Paxton, D. B. Hinckley, C. H. Simpkins, C. F. A. Talbot, A. Ambot.

Regent M. Co.—Nov. 16. (Virginia City, Nev). Location, Nevada. Directors—M. C. Hillyer, C. L. Weller, T. W. Hubbard, L. D. Folsom and Joseph F. Angel. President, M. C. Hillyer; Vice President, C. L. Weller; Secretary, T. W. Hubbard; Charles Elliott, Transfer Secretary, San Francisco; George B. Hillyer, Superintendent. The Regent Co. have 1,500 ft. of ground at Silver City, Lyon county, adjoining the Lower Comstock, and absorb all the leases, etc., from the Royal and Lower Comstock to the Emigrant Prospecting Co. Thus all these different claims—Royal, Lower Comstock and Emigrant Prospecting Co.—will hereafter disappear and all the ground will be known as the Regent. In the last two months the mine has produced nearly $50,000 in bullion, and they are now hoisting and sending to the mill 40 tons of ore per day.

Carson & Colorado R. R. Co.—Third Division—Nov. 19. Capital stock, $9,000,000 in 90,000 shares. Directors—H. M. Yerrington, D. A. Bender, J. H. Dobinson, Wm. S. Wood, D. L. Bliss, S. P. Smith, M. B. Langhorne, all of whom except S. P. Smith subscribe for ten shares of stock each. S. P. Smith, another name for D. O. Mills, subscribes for 1,980 shares, and he has been elected Treasurer of the corporation. The proposed route, on a narrow-gauge track, is from McBride's station, Mono county, the southwesterly terminus of the Second Division, thence by way of Owen's valley and across Mojave Desert to a point in the main line of the Southern Pacific railroad at or near Mojave station, Kern county; an estimated distance of 204 miles.

Meetings and Elections.

Curtis Cons. M. Co., Nov. 18: Directors—John Sedgwick, A. C. Hiester, J. W. Hussey, H. S. Stone and W. M. MacMillan. Officers—A. C. Hiester, President; J. W. Hussey, Vice-President; H. S. Stone, Secretary; David Wilder, Assistant Secretary; Bank of California, Treasurer.

Mammoth Gravel M. C., Nov. 18: Directors—Thomas H. Blythe, L. H. Varney, Thomas D. Diune, Thomas W. Nowlin and William H. H. Hart, who organized by electing Thos. H. Blythe President, L. H. Varney Vice-President, Thos. H. Nowlin Treasurer, and Wm. H. H. Hart Manager and Secretary.

Jumping of Mines.—One of the first topics which Congress will take up when it meets will be the amendments of the mining law. From its action last year, it may be inferred that neither Judge Belford's bill, which received the unanimous approval of the two committees on mines, nor the subsequent hill, which was published last winter, will readily receive the assent of Congress. Yet something ought to be done. Some measure ought to be devised to stop the business of jumping. It has become a regular trade here, in which some of the worst men of the community are engaged, knowing full well that they can always sell their jumper's title—if not to the parties whose property they have jumped, to some outside speculator. There are plenty of men with money in Leadville who are ready to buy a jumper's title if the property promises well. The new law ought to protect a poor man in his rights to the property on which he has spent his money and his time, without having to guard over it with a shot-gun.—*Leadville Circular.*

In the main south drift on the 2275 level of the Overman they are feeling ahead with the diamond drill to guard against water. Some hot water had commenced coming in at the face of the drift before the drill was started.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Kennedy.—Amador *Ledger*, Nov. 19: The mill suspended operations last Saturday. There is nothing doing around the mine except bailing water out of the shaft. How the rock lately crushed paid we are unable to say.

Plymouth Notes.—A Burleigh drill was sent down the north shaft of the Empire on the 15th. It will be in running order in a few days. Fifty-five stamps are kept in motion at the mill.

CALAVERAS.

Hydraulic.—*Mountain Echo*, Nov. 10.: We learn that a hydraulic is soon to be erected on the celebrated Gold Hill mine at Smith's Flat, the proportions of which though small will add greatly to the facilities for the successful working of the mine. The length of the main pipe will be about 800 ft, as to size we are not informed. This mine was first discovered some 23 years ago, and the surface was immensely rich as well as the quartz. It is the intention of the present owners, Osborn & Sou, to commence operations in a short time.

Rawhide Ranch.—*Mountain Echo*, Nov. 15: Rawhide is not very lively just now, but gives promise of a vigorous future, when the various quartz mines in the neighborhood are more fully developed. The Mother lode, as you are probably aware, runs directly through this place, and there is no reason why all the claims located along the line should not prove of value when more thoroughly developed. That they are likely to prove such, is shown by the success of the Gem and Alabama mines situated about three-quarters of a mile northeast of this place. Though the mills are now shut down, owing to the lack of water, operations will be resumed as soon as the water is turned on. These mines are understood to be in a flourishing condition, especially the former. The Gem is owned by Mr. Harris, the Alabama by Mr. Harris and Gen Gashweiler of San Francisco. One peculiarity of these mines is that the most work has been done and the richest ore found, not in the large vein known as the Mother lode, but in the small veins to the east of the parent vein. Coming this way lie the Hooker and Rawhide two claims now owned by the same parties, but upon which no work of consequence has yet been done. Next in line is the old Rawhide mine. Some prospecting is being done toward the northwestern extremity of this claim by Mr. Haydock, who has the mine in charge at present, and it is likely that extensive operations may be commenced before a great while. This claim has a first-class mill, at present in a state of disuse, and is considered by many one of the most promising mines in the country. Running northeast toward Mormon creek are a number of claims, one of which—the Tarantula, owned by Mr. Frisbie—is now being prospected. This is something of a pocket country, too, a number having been found, but you needn't get excited and come over here on that account, for the Mother lode is located from the Stanislaus to the Tuolumne, nearly all the surrounding country is plastered over with patented ranches, and what is left I claim. What we want here is not prospecting, anyway, but capital—men with means and energy who will develop mines, build mills, bring out natural wealth, and make things howl generally.

EL DORADO.

Grizzly Flat.—Cor. *Mountain Democrat*, Nov. 12: Mr. Lyon is pushing ahead at the Driesbach mine, and has sunk a shaft over 30 ft. It is in old ground and he does not expect to strike a ledge for some time. He is now about to let a contract for sinking another shaft 150 ft deep, and as they now have a boarding house completed on the ground, Mr. Gignac can give his whole attention to the management of the mine. The Melton mill is running steadily on rock from one of Driesbach's mines, and from present indications the result will be most satisfactory. The contractors of the Treat mine have finished their 100 ft contract, and it is understood that work will go right along for further developments. Mr. Bullard will start his mill on the Sacramento mine during next week if water can be had. At the Eagle mine they are working two shifts, running tunnel on ledge. At the Mount Pleasant the new mill is completed and during the week will crush about 10 tons of rock as a trial test. The new hoisting works are about completed, and Supt. Smith has men now putting a cage in the shaft. From present appearances, everything will soon be in order, and the mill will be kept running permanently. They are laying in a large supply of wood, timbers, etc.

Another Good Quartz Ledge.—*Mountain Democrat*, Nov. 19: Messrs. F. M. Bickerhoff, F. H. Goyan and A. H. Reed have been drifting in the claim at Ringgold, known as the "Judge Reid claim," and have struck a large and strong ledge of very handsome quartz that gives a fine prospect and will pay at least $30 per ton by mill process.

New Mining Superintendent.—Prof. Thos. Price came up from San Francisco last Wednesday, accompanied by Mr. W. A. Jones, the newly appointed superintendent of the Pacific mine, who takes the place of Mr. Isaac Thomas, recently deceased.

Another Gravel Mine.—McGinnis and Wheeler, at Fort Jim, are running a tunnel and otherwise opening up for systematic operations a bed of gravel that gives very fine prospects.

The Highville Mine.—The now mill on the Highville mine, near Newtown, Patterson superintendent, started up last week and is crushing gravel of extra good quality. In this mine, besides the fine gold that permeates a thick stratum of gravel, it has been common to find in the crevices and on the bedrock a considerable amount of coarse gold. In some instances chunks have been found that weighed from $200 to $300. A few days ago, since work was commenced under the present management, a nugget of solid gold was found which weighed a fraction over 3½ ozs.

Enormously Rich.—The mine at Pleasant valley, commonly known as the Gross mine, recently purchased or bonded by J. E. Lyon, has been turning out some enormously rich ore within the last week. It is from a shaft that is being sunk on the new ledge, which shaft is now down about 30 ft below the bottom of the tunnel. This new ledge was discovered by following some exceedingly rich stringers that made off to the southwestward from the main ledge. The ore taken from the shaft has all been good, ranging from $200 to $500 per ton, but latterly it has been improving, and that taken from the bottom is thickly flecked with gold, and is estimated to be good for fully $1,000 to the ton. The ledge is about 3 ft thick, beautifully ribboned, and the sulphurets are very rich. Mr. Lyon's experience in Colorado has made him more a smelter than a miller of ore, and has convinced him that the smelting process is proportionately much more profitable when applied to high-grade than in the case of low-grade ores, and therefore he has determined to sack this rich ore and send it to San Francisco to be smelted. Already a considerable amount has been sacked, and he has contracted with Mr. Landecker, of this city, to furnish him with a thousand sacks to be used for this purpose.

MARIPOSA.

Mining Items from Coulterville.—*Herald*, Nov. 19: We learn that Messrs. Hulings & Shreve, the President and Treasurer of the Mariposa Quartz and Lumber Mills and Mining Co., are operating on the Malvena quartz lode (or series), which is a parallel vein of the Mary Harrison vein (or Mother lode). The tunnel starts on the Potosi and runs under to open the old Malvena. The tunnel is in about 2,000 ft. The ore shows milling rock for 300 ft on the Malvena. The width of vein on the different cross-cuts shows from 4 to 15 ft. The company are preparing to do extensive work, and have a large amount of machinery in transit for their mines in that locality.

A Big Sale.—Mariposa *Gazette*, Nov. 19: A large sale

of real estate appears entered of a late date in the Recorder's office of Mariposa county. The Mariposa Land and Mining Co., of California, sells to the Mt. Bullion G. M. Co., of New York, 12 sections of land, consideration $1, and $12 000 000 capital stock.

THE LATEST MINE.—The news this week from this mine is of a most cheering kind. The stope from the 70 level is producing more gold than at any other time previous, and continues to improve as the work progresses. Free gold is visible all through the vein matter, and is pronounced exceedingly rich.

LOOMING UP.—The extensive quartz mine near Hornitos known as Quartz mountain, at present under the control of the California Developing Co., is producing fine ore in large quantities.

NOT SERIOUS.—The explosion of the small powder magazine, occurring at the mouth of the tunnel of the Hite G. M. Co., one day last week, did but little damage, as we are informed, and nobody hurt.

NEVADA.

DEATH OF BENJAMIN COLEMAN.—*Transcript*, Nov. 19: Benjamin Coleman, aged 45 years, brother of John C. and Edward Coleman, of this place, died in Washington, D. C., on the 28th of October last. Deceased formerly lived in Grass Valley and at Iowa Hill, Placer county, and will be kindly remembered by a great number of friends. He leaves a son, Arthur, who resides here with Edward Coleman.

A HEAVY BLAST.—San Juan *Times*, Nov. 19: On Saturday evening last the houses of this place were terribly shook up by a blast in the American mine in which 27,500 lbs. of black powder was utilized. The blast did immense execution. It tossed up the whole earth 120 ft in width and 100 ft in length into the hill with a bank face of over 100 ft. The mine is now run by the Yuba Tunnel G. M. Co., a corporation. To prepare for this immense blast a drift was run into the hill as near bedrock as possible, 100 ft; at the end of the drift other drifts were run each way 60 ft, making 220 ft in all. Into these side drifts the powder was placed and the main drift tamped. It was all exploded in an instant of time.

PLACER.

MICHIGAN BLUFF.—Placer *Herald*, Nov. 19: From Ed. Thompson, of Michigan Bluff, we learn that everybody there is well and happy, and times lively. The chrome mines near the bluff are being actively worked, and their extent is practically limitless. During the late storm considerable snow fell at that point.

PLUMAS.

MONITOR.—Greenville *Bulletin*, Nov. 19: The Monitor mine is being worked vigorously. Mr. George Comptou is superintending the mine, and has three shifts of men employed drifting on the ledge. The ore looks well, and milling will soon begin. Mr. D. L. McDonald, of San Francisco, President of the Crescent M. Co., is now at Crescent completing arrangements to re-open that extensive and valuable property. A few men are already at work, fixing up and repairing machinery preparatory to the commencement of extensive work in the early spring. A new working shaft will be sunk, and all the old works thoroughly opened and repaired. The Crescent is well known to be one of the oldest and best mines in the district; it has yielded more bullion in past years than any other mine in it, yet has only been worked to a depth of 180 ft. In the bottom of the deepest shaft is a splendid lode, warranting the assurance that when developed sufficiently it will place the mine upon a permanent dividend paying basis. The people of this vicinity have the greatest confidence in the value of the mine, and will receive with much pleasure the news that it is to be re-opened. The Taylor Plumas mine has recently been sold to, and incorporated by, a New York Company. It is located near the Crescent mine, and was formerly known as the Taylor mine. Mr. M. B. Bransford is a large stockholder, one of the Directors and general superintendent. He has a double shift of men employed driving the tunnel into the mountain along the line of the lode, which daily improves, both in width and richness. The face of the drift now shows 5 ft of high-grade ore. Ample means have been provided for developing the mine and building stamp mills and other needed improvements. The superintendent has the greatest confidence in the superior value of the property, and is pushing forward the development of it, as fast as circumstances will permit.

SHASTA.

SUNNY HILL.—Shasta *Courier*, Nov 20: Mining matters at Sunny Hill are going ahead. Dutton & Peck's arastra and Balinu's arastra are both busily engaged in grinding rock. Joe Davis is running a tunnel on his own new strike, and is taking out good ore. C. J. Russell is running a tunnel on the old Alice mine to tap a rich chimney of ore, cropping about 18 inches in width. Grant, of the firm of Knox & Grant, of Bullychoop, has left Bullychoop for the winter, and is now engaged in prospecting in Sunny Hill mining district in company with a Mr. Bumgarner. We understand that all hands will leave Bullychoop for the winter except the parties engaged in running a tunnel on the old Bullychoop ledge—they will remain and fight it out with the great storm king of that section. Bullychoop is a cheerless region in the winter season, owing to its great altitude. Charles P. Summers and Robert Hall will run J. P. W. Davis' hydraulic placer mine, near Eagle creek, this winter.

QUARTZ HILL.—Thos. J. Harrison was in town Wednesday. He has been engaged in sinking a shaft on his quartz ledge at Quartz Hill, and has it down 40 ft. The ore is good, and the ledge which has varied considerably in width as exposed, is 3 ft in thickness at the bottom of the shaft. Other parties who have locations on the same ledge and have been sinking shafts will probably join with Tom, and the combination concentrate their labors on one shaft. Old Quartz Hill once had very rich placer mines and has the biggest upheaval of quartz to be found above the surface of the earth in this county, while small quartz rocks and pebbles, often containing gold, whiten the ground in every direction. Therefore it is believed that the ledges in the neighborhood will prove to contain rich ore when developed.

SLATE CREEK.—Times have been pretty good the past summer and fall in this upper country, and freight and travel has been lively on the road. No big strikes have been reported in the mines, however, for a long time, although the miners' picks continue to sound from Soda, Hazel and Mears creeks to Portuguese flat, Slate creek and old Dog creek. But times have changed, especially on Dog creek, where the remaining diggings are hard to work, and do not "pan out" like they did 20 years ago when the "Five Nation" company (made up of an American, a Pole, a Prussian, a Sardinian and a Frenchman) took out gold by the handful from their claim on the hillside, or even later, when McCall sluiced out the $100 and $200 ebunks, then noted in the columns of the *Courier*. Those were the days, too, when our old blacksmith and others took out a mint of money on old Shenanagan bar, and gave some of it a lively chance at another bar—not that of justice, however.

EAGLE CREEK AND SUNNY HILL.—Preparations are being made for active work this winter in and around Piety hill The Piety Hill Ditch and Gravel Co. have replaced quite a lot of old pipe and "giants" by new ones. About 2 years more will witness the washing away of old Piety hill. The company are within about 200 yards of the town. The Chicago Co. of South Fork, are now engaged in working and prospecting their mine. Other mines and mining improvements are rapidly progressing in that district. Messrs. Lauderwasser & Roussell have now got their silver mine pretty well developed, and are quite well pleased with their ore showing, and are waiting on the movements of parties below preparatory to the erection of proper reduction works.

SIERRA.

TRUCKEE GRAVEL MINING CO.—Truckee *Republican*, Nov. 19: From Supt. C. F. Byrne we have received the following information concerning the condition and prospects of the Truckee gravel mining company: This company has been quietly going along for the past 2 years prospecting for an ancient channel or river bed situated in the northeastern portion of Sierra county, in Gold Lake district, at an expense of several thousand dollars. This is the first company to start into the deep or hill prospecting, on the Mohawk side of the ridge. The surrounding ravine or surface diggings being very rich, the character of the gold being very coarse and of the finest quality, nuggets being found weighing as high as 56 ozs, the flattering prospect being found in the Truckee claim this summer were obtained at a distance of 750 ft in the mountain, where the channel is beginning to come in, the character of gravel at this point being of the heaviest kind of wash, and of an easy, drifting nature. Everything is now shut down for this winter and in readiness for starting in the spring with the first water.

WATER.—*Mountain Messenger*, Nov. 19: The late storm will give the miners considerable water, and make times brisk for our drift and hydraulic claims. The main tunnel of the Bald Mountain Extension Co., Forest City, is being surveyed this week, by the Bald Mountain Co. The storm this week has driven the Chinamen out of the river, here at the forks. This is the third time that the high water has flooded their diggings and caused them to suspend work, yet they are, with their ancient persistency, at it again.

SIERRA CITY.—The new tunnel of the Sierra Butte M. Co. is in about 250 ft and they are in blasting rock. The heatings for the air compressor are nearing completion, and the Burleigh drills will be set to work at an early day. At Loganville, at the Marguerite mine, things look lively. The company at present employ 32 men. The boarding-house and office are completed, and the mill is near under roof. The machinery and timbers for the hoisting works are on the ground, in fact, everything is being pushed ahead as fast as possible under the able management of Supt. Taylor. The tunnel of the Blue Gravel mine is in 650 ft. The property of this company is one of the best around Sierra City; bedrock was struck in the tunnel about 2 weeks ago, and at last accounts gravel is coming in which prospects in fine gold.

NEVADA.

WASHOE DISTRICT.

UTAH.—Gold Hill *News*, Nov. 21: The blower station at the 2500 level is completed and the blower is in place. The east drift has been extended 30 ft.

SIERRA NEVADA.—On the 2700 level the joint Union Consolidated east winze has been sunk and timbered 10 ft, the joint Union Consolidated east drift was advanced 50 ft, and the west drift 26 ft.

OVERMAN.—Drillhole on 2275 level was run on course of drift 185 ft, when the rod broke and we had to abandon the hole.

OPHIR.—There have been extracted from the cropping 228 tons of ore, and bullion to the value of $17,021 56 has been shipped.

UNION CONSOLIDATED.—In the joint Mexican east winze down from the 2500 level are cutting out a station at the 2700 level.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, Nov 19: The development on the fourth shaft level, mentioned in report of last week, did not prove as anticipated. Ore still shows on the north side of the drift and the outlook is favorable for it continuing down. The general formation in this vicinity is still promising. The other shaft levels have shown no material change during the week. The adit and levels above are not showing quite as well as last week and are not producing quite as much ore. There are being extracted and sent to the mills about 60 tons of ore daily. Both mills are doing the usual amount of work. Bullion shipments for the week ending November 16th, amount to $21,181 57, and aggregate $40,859 26 on November account to the above date.

MOUNT DIABLO.—A drift has been started east, from the bottom of winze No. 1, on the third level, the face of which is in low grade quartz ore assaying from $32 to $39 per ton. The north crosscut from winze No. 3, is in 100 ft. In the intermediate, below the third level, the ledge is smaller but the ore still continues of fair grade. The east drift on the third level has advanced 13 ft It has shown spots and streaks of ore, assaying from $40 to $64, since last report. The winze from the east drift on the second level has reached a depth of 58 ft. The upraise from the west drift, same level, has attained a distance of 42 ft. The winze in the gulch is down 175 ft.

CRABB DISTRICT.

WATER.—Esmeralda *Herald*, Nov. 19: S. Y. Crabb, after whom Crabb mining district was named, paid the *Herald* office a visit last Sunday. He says preparations are being made to take water out of Walker river at a point that will give sufficient fall to run the wheel for the mill which is to be built by H. X. Thompson. The mill is expected to be ready to crush ore by the 1st of March. Only a few men are at work in the mines at present, but active operations will commence next month. A boarding-house has been built at the mill site on the river and is now open for the accommodation of the public. Two houses are in course of construction at the mines. Mr. Crabb thinks they will be shipping bullion in five months.

CHERRY CREEK DISTRICT.

STAR.—White Pine *News*, Nov. 12: At the Star the usual work is going on in the several drifts above the 540 level, and the usual quantity of ore is being extracted, which now shows a higher assay than for several months past. The sinking of the shaft is also progressing satisfactorily. At the Exchange, they are clearing away the ground around the shaft, and doing other necessary work, preparatory to starting operations on a large scale They will also put their mill in order, or what is more probable, erect a new one. The Exchange is a valuable mine, and with adequate milling facilities, cannot fail but prove a source of profit to the owners. The Tecup property is at a standstill. The notes of this company to creditors here fall due on the 20th inst., and it is probable that some of its leading officers will be out from New York at that time and make arrangements to resume work at an early day. They have a good mine and mill, but like most Eastern companies, they expected too much at the outset, and that was what brought on their financial complications.

EGAN CANYON DISTRICT.

SAN JOSE.—White Pine *News*, Nov. 12: At Egan Canyon, the repairs to the San Jose Co.'s mill are nearly completed and teams have already commenced to haul ore from the mine to the mill. The ore stopes in the mine are now looking much better than a month ago, and in consequence the force of miners has of late been considerably increased.

ESMERALDA DISTRICT.

THE CORTEZ MINE.—Esmeralda *Herald*, Nov. 19: The incline shaft has reached the lower tunnel level, and the tunnel is being rapidly pushed to tap the ledge at that point. The intersection will be made some time this month. Work has been commenced on drift No. 1, running west from the upper tunnel. This drift will open up a portion of Silver Hill that has never had a pick stuck into it, and those familiar with the character of ground now being broken in the drift, say the chances of encountering rich ore bodies in that direction are very favorable. Things are running smoothly in the absence of Supt. Wells, under the guidance of acting Supt. Tucker and Foreman Murphy.

RICH ORE.—Recently 20 tons of ore from the Aurora Hill Con. mine, of this place, was shipped to Bodie and worked in the Bulwer-Standard mill. The result was $8,475 05 in gold and $512 07 in silver, making $8,985.12 the total yield of the 20 tons; or, $440.25 per ton. As we have repeatedly stated, and we want it as a mill to show the outside world that we have got mines, and good ones, too.

THE FANNIE GOLDEN.—Ed Greeley has started operations on the Fannie Golden mine. Griff. Williams is superintendent. The tunnel is being driven ahead with the expectation of striking the ledge at no very distant point. But should the ledge be a myth, the Fannie Golden is a good property, for a good supply of water already has been encountered, which could easily be brought into town for use, and would insure a revenue to the owners equal to a dividend-paying mine.

GARFIELD DISTRICT.

LOTTIE.—*True Fissure*, Nov. 14: The owners of the Lottie mine, located in Garfield district, have received returns from a shipment of ore worked by the Lyon M. & M. Co. The first-class ore yielded an average of $1,391.20 per ton; the second class, $954.34. The ore was sacked for convenience of handling, each sack containing 110 lbs. and produced an average of $76 per sack. The owners of the Lottie are deserving of their success from the energy which they have displayed in the rocky, waterless country where it is situated.

SAFFORD DISTRICT.

SATISFACTORY.—Eureka *Sentinel*, Nov 19. We are pleased to learn, from a reliable source, that the developments now being made in the above named district are of a most satisfactory character. The vein on the northeast end of the Onondaga continues in ore of a high grade. In the Mary Ann, a location southeast of the Onondaga, a cut was run on the surface some distance and the ledge struck, upon which a shaft is being sunk. At a depth of 20 ft a body of blue bromide ore, 5 ft in thickness, with well-defined walls, has shown itself. The ore appears to be strong in place and has every appearance of being extensive. At a further depth crosscutting will commence and the bonanza explored. Work on the Alta is being prosecuted with vigor. The shaft is down 25 ft, with ore in the bottom the full width of the shaft. The ore is rich, and the prospect bids fair to be second to none in the district. The Constitution has a shaft down 65 ft, with the ore body showing as strong as ever.

SHELL CREEK DISTRICT.

EL CAPITAN.—White Pine *News*, Nov. 12: The El Capitan, at Schellburn, is looking well, and good ore is being extracted. They are now hauling ore to the mill, which will be started up next Monday. A profitable run is anticipated.

SILVER CANYON DISTRICT.

ORE.—White Pine *News*, Nov. 12: At Silver canyon, Dr. Brooks' company are doing some good work in the way of dovetailing and extracting ore from the Sadie L., Blue Bello and Buckborn mines. The company's mill is also running to its full capacity.

TAYLOR DISTRICT.

MONITOR.—White Pine *News*, Nov. 12: The Monitor Co., at Taylor district are working a big boranza, and are making nice bullion shipments by every stage. No doubt, Messrs. Briggs, Lyon and McGill have one of the best mining properties in eastern Nevada, and all being practical men, they are working it to good advantage.

WARD DISTRICT.

MARTIN WHITE.—White Pine *News*, Nov. 12: The superintendent of the Martin White Co., at Ward, reports to his company that he is taking out some of the finest ore ever discovered in the mine. This, of course, means that it goes away up in the hundreds. Taken altogether, the mining interests in eastern White Pine look far more promising than for years past.

ARIZONA.

PLACERS.—Arizona *Miner*, Nov. 18: B. C. Smith, superintendent of the company that recently purchased, through Messrs. Murphy & Moody, the Jackson placers, on Lynx creek, reports that he is busily engaged clearing out the old ditch and reservoir. The ditch is over a mile and a half long, and can flume about 300 inches of water. The reservoir is on the diggings, and is used for ground sluicing. The ditch is tapped with iron pipes that are used for hydraulic mining. This property, when systematically worked, has always paid well. The late Calvin Jackson made a handsome clean-up the winter before he died. We are glad to see energetic men run this property, and will report progress from time to time.

YAVAPAI.—Doctor Farnham, who represents the Yavapai M. & M. Co., returned from a visit to some of the properties belonging to the company yesterday. He furnishes us the following particulars: On the Yavapai they have a tunnel in 200 ft, with a vein 12 ft wide, containing 6 ft of very high-grade ore. At the distance of 200 ft, the ledge is 100 ft or more beneath the surface They are now drifting south, and will soon cut the ledge to ascertain its correct width. Another property belonging to this company is the Wadleigh, containing gold, samples of which exhibited to our view were perfectly permeated with bright particles of the precious metal.

CONTACT.—Tombstone *Epitaph*, Nov. 20: The strike in the Contact is better than we were at first led to believe. It was made at a depth of 17 ft. The ore is a heavy, rich, brown and yellow carbonate. Those who have been to the mine pronounce it the most promising of anything heretofore struck in that section. We hope those having it on bond will make a fortune out of it. The millionaires who owned and bonded it rather than spend money to develop it, ought to see it prove the richest mine in this rich camp, just to make them happy for the act of generosity they performed in giving others a show to become rich men also.

WORTHINGTON (SAN DIEGO) MINING CO.—A rich strike has been made in an uprise from 130 level. A 6-inch vein of grey carbonate was encountered, assaying $200.91 silver with a trace of gold. The average of assays taken across a 4-ft ledge was $81.

COLORADO.

OLD HICKORY COPPER MINE.—Salt Lake *Tribune*, Nov. 18: Work on this mine still continues with the most encouraging results. Negotiations for one of Rankin, Brayton & Co.'s improved copper smelters have been entered into. These new copper smelters are now doing splendid work for the Copper Queen mine, Bisbee, Arizona, and have developed a good property. Other places in Arizona, California and Colorado are using these smelters and meet with unbounded success. B. A. Spear, who is their agent in Utah, expects to have, before the close of another year, quite a number of them running in Utah.

PAYROCK TUNNEL.—Cottelyou & Co., who have a lease on the HopeWell, have been at work only a little over a week, and, although they commenced in barren rock, have opened up a streak of 900 ounce ore.

BISMARCK.—The stope is still improving. A mill-run made last week contained over 230 ozs silver per ton, an increase of over 50 ozs above the preceding run. The production for the last month has paid the owners at the rate of about $11 a day for each man employed.

EAST CASHIER.—In the Italian's lease they have an average of about 6 inches of ore for about 80 ft, sometimes widening to 12 inches and sometimes pinching out to 1 inch. The last mill-run from this lease gave 601 ozs first-class and 263 ozs second class, the whole mill-run returning $2,336. This was from the work of 4 men for 6 weeks.

DUNKIRK.—Hennessy & Co., lessees, are stoping on the 420-ft level, west of the shaft, and have from 3 to 4 ft of quartz, with mineral scattered throughout the entire width. At the last mill-run, about 3 weeks since, the return was 100 ozs silver, sorted into 1 class.

MENDOTA.—For the last week the workmen have been employed in putting up a whim-house, 28x24 ft, which has delayed the work in the mine. In general the ore is improving gradually in quality, as depth is gained. The best ore, gray copper, is associated with rosin zinc and this is increasing in quantity.

PELICAN-DIVES.—Work has been stopped in the main shaft in consequence of the influx of water, but sinking will be resumed as soon as a pump can be furnished and put in place. Manager Duff has now gone east on company business and will procure the pump during his absence. Bush & Kennedy's lease is in about the same condition in every respect as we published 3 weeks since, producing about the same amount of ore. These parties have also commenced sinking on the Unicorn, 200 ft west of the main tunnel. Phillips & Co.'s lease is unchanged in character and produces the usual quality and quantity of ore. The lease of Fitzpatrick & Coughlin is looking well and improving. They have from 1 to 5 inches of high grade ore. A new lease has been let to Ed Barry and James Rowe in the old surface workings of the Pelican on the west side of Cherokee gulch. They took out about 2 tons of ore last month, carrying between 300 and 400 ozs silver.

IDAHO.

THE FIRST SMELTER CLOSED.—Wood River *Times*, Nov. 16: At 3 o'clock yesterday the Wood River Smelting Co.'s works were closed for the winter. The summer campaign of these works will mark an epoch in the history of Wood River, as the first local smelter started up. The small capacity of the furnace—10 ton per day—precluded the possibility of any larger profit accruing to the owners from its working, but by next spring they will have a 30-ton furnace, and can then look for results satisfactory in every respect.

BRODHEAD'S MINES.—Col. Brodhead, of Sawtooth, has shown us a sample of the recent strike in the Beaver Extension claim. It is a handsome specimen of black sulphuret and ruby silver ore that is evidently very rich. The sample came from the middle of Brodhead tunnel of the claim. This tunnel was started on the foot wall about a month ago. After running it a distance of 80 ft, a couple of shots were put in the ledge in the side of the tunnel, and 2½ ft of ore that will average between $300 and $400 a ton were uncovered.

THE NELLIE GROUP.—This group is composed of 6 mines situated in Smiley's gulch, and is being developed by 3 tunnels. Two of these tunnels are in the Nellie—the claim whence the group derived its name—and are just getting in the ledge. The other tunnel is in the Nellie Extension. When Col. Brodhead left this tunnel had cut into 2½ ft of ore.

MONTANA.

BELLE OF BUTTE.—*Inter-Mountain*, Nov. 18: For some time past the sinking of the Belle of Butte shaft has been vigorously progressing, and it has now attained a depth of 160 ft. Several days ago a crosscut was started south, which, yesterday, at a distance of 8 ft, struck the footwall. The ledge has since been penetrated 5 ft and the hanging wall has not yet been encountered. Mr. Jas. Talbot, from whom we obtain the above information, states that no assays have yet been made, but from the appearances of the ore, as uncovered in the crosscut, he is of excellent grade and gives promise of developing handsomely. From the footwall the crosscut, as far as extended, is all in ore, and from the rapidity with which the ledge increased in width in the upper levels, it is reasonable to assume that at the present depth an extensive ore body will be developed. In the meantime, the crosscut is being rushed ahead.

LEXINGTON.—It is not definitely settled whether or not it was the main ledge which was tapped in the Lexington on Tuesday. There is, however, no disposition to deny the fact that a large body of high-grade ore was encountered, so that in any event the strike was an important one.

ALICE.—The Bruckner furnace in the Alice mill will be fired up in a few days and will prove of vast benefit, as the stamps will operate exclusively on base ore. The bullion, too, will be finer than it is now and a considerable discount will be saved.

MORNING STAR.—We have another ore body this time. Where we passed through the ledge in the shaft, there was a pinch, but I knew the ore shoot was west, so started a drift with entire confidence. At 40 ft we struck specimens of native and wire silver, just like we had in the upper level, and then I knew that we had 'em. Yesterday morning she looked better than ever, with about 12 inches of clean, solid ore and a good deal of fine looking ledge matter. When I went down the shaft this morning, there was less ledge matter and more ore. At the distance of 50 ft from the shaft, there is now a 3-ft breast of quartz that samples 90 ozs in silver and some gold. From the upper level, at a distance of 40 ft from the shaft, we started a winze which is now 30 ft deep, and which shows in the bottom 1½ ft of very pretty ore. This will be a good deal wider when we make connection with the 200 level, and you can just imagine what a pretty piece of ground will soon be available for stoping.

PHILLIPSBURG.—Cor. *Inter-Mountain*, Nov. 18: The Hope mill is running night and day, being plentifully supplied with ore from the Hope mine, which, under the careful management of Mr. B. Ballard, the very efficient foreman of the mine, is keeping up its old time record. The Algonquin mill, which has been closed for a short time, will start up again in a few days, with plenty of ore on hand. Mr. J. K. Pardee, with his usual foresight and eye to business, has leased the Emerald mine from Messrs. Ulery & Thomas. Operations on the Trout are progressing as usual. Mr. Freeman is developing the Tintic and Cheyenne, and in all probability, we will hear from him in a short time, as this property is the extension of one of the best leads ever struck in Phillipsburg.

OREGON.

QUARTZ.—*Democratic Times*, Nov. 18: A spur of quartz has been found in the tunnel now being run to strike Geo. Schumpf's ledge near Willow Springs, and it is expected that the main ledge will be struck very soon. The prospects are announced to be favorable. George W. Lance, of the firm of Lance & Hosmer, (who are engaged in extensive mining operations on Foot's creek), was in town Wednesday after some hydraulic pipe manufactured at K. Kubli's establishment. He says that the rains furnished considerable water, but it has since run down. Charles F. Chappel & Co., of Star gulch, are at work, though with a limited supply of water. W. S. Brodbeck and Lennes Kipple are again working their claim on Dividend bar. Some of the miners have been engaged to do some work, but most of them are engaged in getting ready. Piping is going on at the mines of the Sterling Co. and Gin Liu, though the ditches are not full as yet. All the miners are getting ready for winter and a great deal of mining will be done this season, much more than last. Dan Silva, at the Grand Rapids gravel diggings, made a cleanup the other day that resulted satisfactorily. Piping still continues. Messrs. Bolt, Layton and others have purchased Hadley's interest in the great ledge recently discovered on Steamboat. The ore promises better than ever. J. W. Ingram and John Ambrose have purchased a piece of mining ground in Willow Springs precinct, and have been engaged in clearing up the ground sluice. The Squaw Lake ditch company will soon receive a large amount of new hydraulic pipe from Portland. This assures more extensive and successful operations by the company, which is all that is needed.

UTAH.

SOUTHERN UTAH PRODUCT.—Silver Reef *Miner*, Nov. 12: For the past few years Utah has held a first place among the silver-producing States and Territories of the country. And although less favored in many respects than our neighbors on the east and west, the time is fast approaching when it will lead the van in the product of the precious metal. It only remains for southern Utah to receive that recognition which is its due, and this result will soon be accomplished. San Francisco district, lying immediately on our northern boundary, within a brief time has demonstrated to the satisfaction of the most skeptical that our mineral deposits are not only large but immense. The Horn Silver is now acknowledged to be the largest developed ore body in the world, and there are many other mines in that and adjoining districts which are making a splendid record and require time and labor only to prove their worth. In our own district we can point with pride to the fact that all our mines that are being operated are paying handsome dividends, which can scarcely be said of any other within the great mineral territory. The companies that have been actively engaged for the quarter ending September 30th last—to-wit: the Christy, Stormont and Barbee & Walker with an average of 15 stamps, or 5 to the company, gave a bullion product aggregating $273,000. This will be considerably increased during the current quarter; but taking the above figures, it is safe to put the product of the stamps, allowing continuous operation, at $1,100,000 for the year ending December 31, 1881.

At the incline from the joint shaft of the Belcher and Crown Point companies repairs have been completed to a point 100 ft. below the 2560 level. They are putting their pumps in condition to handle all the water.

Practical Lectures to Mechanics.

(CONTINUED.)

Constructive Processes.

Machinery is divided into four classes:

First—Motive machinery for utilizing or converting the natural forces.

Second—Machinery for transmitting and distributing power.

Third—Machinery for applying power.

Fourth—Machinery of transportation.

Or, more briefly stated: Motive machinery; machinery of transmission; machinery of application; machinery of transportation.

Each of these classes should be treated separately, or, as we might say, some branch of either of these classes would be a sufficient theme for a lecture or a number of lectures.

The remaining part of my lecture will be devoted to

Machinery of Application,

Or, rather, to the processes performed by such machines, mainly in calling your attention to concrete facts. First, I will speak of forging:

A peculiarity of forging is that it is a kind of hand process, where the judgment must continually direct the operations, one blow determining the next, and while pieces forged may be duplicates, there is a lack of uniformity in the manner of producing them. Pieces may be shaped at a white welding heat or at a low red heat, by one or two strong blows or by a dozen lighter blows, the whole being governed by the circumstances of the work as it progresses. A smith may not throughout a whole day repeat an operation precisely in the same manner, nor can he, at the beginning of an operation, tell the length of time required to execute it, nor even the precise manner in which he will perform it. Such conditions are peculiar, and apply to forging alone.

I think proper to point out these peculiarities, not so much from any importance they may have in themselves, but to suggest critical investigation, and to dissipate any preconceived opinions of forging being a simple matter, easy to learn, and involving only commonplace operations.

Forging.

The first impressions an apprentice forms of the smith-shop as a department of an engineering establishment is that it is a black, sooty, dirty place, where a kind of rough, unskilled labor is performed—a department which does not demand much attention. How far this estimate is wrong will appear in after years, when experience has demonstrated the intricacies and difficulties of forging, and when he finds the skill in this department is more difficult to obtain, and costs more relatively than in any other. Forging as a branch of work requires, in fact, the highest skill, and is one where the operation continually depends upon the judgment of the workman, which neither power nor machines can to any extent supplant. Dirt, hard labor and heat deter men from learning to forge, and create a preference for the finishing shop, which, in most places, makes a disproportion between the number of smiths and finishers.

Forging plant consists of rolling mills, trip hammers, steam hammers, drops and punches, with furnaces, hearths and blowing apparatus for heating. A general characteristic of all forging machines is that of a great force acting throughout a short distance. Very few machines, except the largest hammers, exceed a half-inch of working range, and in average operations not one-tenth of an inch.

Percussive Force.

These conditions of short range and great force are best attained by what may be termed percussion, and by machines which act by blows instead of positive and gradual pressure; hence we find that hand and power hammers are the most common tools among those of the smith-shop.

To exert a powerful force acting through but a short distance, percussive devices are much more effective and simple than those acting by maintained or direct pressure. A hammer head may give a blow equal to many tons by its momentum, and absorb the reactive force which is equal to the blow; but if an equal force was to be exerted by screws, levers or hydraulic apparatus, we can easily see that an abutment would be required to withstand the reactive force, and that such an abutment would require a strength perhaps beyond what ingenuity could devise.

The Philosophy of Hammering.

This principle is somewhat obscure, and the nature of percussive forces not generally considered—a matter which may be illustrated by considering the action of a simple hand hammer. Few people, in witnessing the use of a hammer, or in using one themselves, ever think of it as an engine giving out tons of force, concentrating and applying power by functions which, if performed by other mechanism, would involve trains of gearing, levers or screws; and that such mechanism, if employed instead of a hammer, must lack that important function of applying force in any direction as the will and hands may direct. A simple hand hammer is in the abstract one of the most intricate of mechanical agents—that is, its action is more difficult to analyze than that of many complex machines involving trains of mechanism; yet our familiarity with hammers causes this fact to be overlooked, and the hammer has even been denied a place among those mechanical contrivances to which there has been applied the name of "mechanical powers."

Let the reader compare a hammer with a wheel and axle, inclined plane, screw or lever, as an agent for concentrating and applying power, noting the principles of its action first, and then considering its universal use, and he will conclude that, if there is a mechanical device that comprehends distinct principles, that device is the common hammer. It seems, indeed, to be one of those provisions to meet a human necessity, and without which mechanical industry could not be carried on. In the manipulation of nearly every kind of material, the hammer is continually necessary in order to exert a force beyond what the hands may do, unaided by mechanism to multiply their force. A carpenter, in driving a spike, requires a force of from one to two tons; a blacksmith requires a force of from five pounds to five tons to meet the requirements of his work; a stonemason applies a force of 100 to 1,000 lbs. in driving the edge of his tools; chipping, calking, in fact, nearly all mechanical operations consist more or less in blows, such blows being the application of accumulated force expended throughout a limited distance.

Machines and tools that operate by blows, such as hammers and drops, produce effect by the impact of a moving mass by force accumulated throughout a long range, and expending the sum of this accumulated force on an object. The reactive force not being communicated to nor resisted by the machine frames, is absorbed by the inertia of the mass which gave the blow; the machinery required in such operations being only a weight, with means to guide or direct it, and mechanism for connection with motive power. A hand hammer, for example, accumulates and applies the force of the arm, and performs all the functions of a train of mechanism, yet consists only of a block of metal and a handle to guide it.

Punches.

Machines with direct action, such as punches, shears or rolls, require first a train of mechanism of some kind to reduce the motion from the driving power so as to attain force; and secondly, this force must be balanced or resisted by strong framing, shafts and bearings. A punching machine, for example, must have framing strong enough to resist a thrust equal to the force applied to the work; hence the frames of such machines are always a huge mass, disposed in the most advantageous way to meet and resist this reactive force, while the main details of a drop machine capable of exerting an equal force consist only of a block and a pair of guides to direct its course.

Large Hammers.

Leaving out problems of mechanism in forging machines, the adaptation of pressing or percussive processes is governed mainly by the size and consequent inertia of the pieces acted upon. In order to produce a proper effect, that is, to start the particles of a piece throughout its whole depth at each blow, a certain proportion between a hammer and the piece acted upon must be maintained. For heavy forging, this principle has led to the construction of enormous hammers for the performance of such work as no pressing machinery can be made strong enough to execute, although the action of such machinery in other respects would best suit the conditions of the work. The greater share of forging processes may be performed by either blows or compression, and no doubt the latter process is the best in most cases. Yet, as before explained, machinery to act by pressure is much more complicated and expensive than hammers and drops. The tendency in practice is, however, to a more extensive employment of press-forging processes.

Crystallization.

Another peculiar feature in trip hammers is the rapidity with which crystallization takes place in the attachments for holding the die blocks to the helves, where no elastic medium can be interposed to break the concussion of the dies. Bolts to pass through the helve, although made from the most fibrous Swedish iron, will on some kinds of work not last for more than 10 days' use, and often break in a single day. The safest mode of attaching die blocks, and the one most common, is to forge them solid, with an eye or a hand to surround the end of the helve.

At the risk of laying down a proposition not warranted by science, I will mention, in connection with this matter of crystallization, that metal when disposed in the form of a ring, for some strange reason, seems to evade the influences which produce crystalline change. A hand hammer, for example, may be worn away and remain fibrous; the links of chains and the tires of wagon wheels do not become crystallized; even the tires on locomotive wheels seem to withstand this influence, although the conditions of their use are such as to promote crystallization.

Among exceptions to the ordinary plans of constructing trip hammers may be mentioned those employed in the American Armory at Springfield, U. S., where small hammers, with rigid frames and helves, the latter 30 inches long, forged from Lowmoor iron, are run at a speed of "600 blows a minute." As an example, however, they prove the necessity for elasticity, because the helves and other parts have to be often renewed, although the duty performed is very light, such as making small screws.

Connected with this matter of forging is the subject of steam hammers:

Steam Hammers.

The direct application of steam to forging hammers is without doubt the greatest improvement that has ever been made in forging machinery; not only has it simplified operations that were carried on before this invention, but has added many branches, and extended the art of forging to purposes which could never have been attained except for the steam hammer.

Keeping in view what has been said about concrete facts, let us apply the inductive process to these machines:

First—The power is connected to the hammer by means of the least possible mechanism, consisting only of a cylinder, a piston and slide valve, induction pipe and throttle valve; these few details taking the place of a steam engine, shafts, belts, cranks, springs, pulleys, gearing, in short, all such details as are required between the hammer head and the steam boiler in the case of trip hammers or crank hammers.

Second—The steam establishes the greatest possible elasticity in the connection between a hammer and the driving power, and at the same time serves to cushion the blows at both the top and bottom of the stroke, or on the top only, as occasion may require.

Third—Each blow given is an independent operation, and can be repeated at will, while in other hammers such changes can only be made throughout a series of blows by gradually increasing or diminishing their force.

Fourth—There is no direct connection between the moving parts of the hammer and the framing, except lateral guides for the hammer head; the steam being interposed as a cushion in the line of motion, this reduces the required strength and weight of the framing to a minimum, and avoids positive strains and concussion.

Fifth—The range and power of the blows, as well as the time in which they are delivered, is controlled at will; this constitutes the greatest distinction between steam and other hammers, and the particular advantage which has led to their extended use.

Sixth—Power can be transmitted to steam hammers through a small pipe, which may be carried in any direction, and for almost any distance, at a moderate expense, so that hammers may be placed in such positions as will best accommodate the work, and without reference to shafts or other machinery.

Seventh—There is no waste of power by slipping belts or other frictional contrivances to graduate motion; and finally, there is no machinery to be kept in motion when the hammer is not at work.

Elastic and Dead Blows

Steam hammers are divided into two classes, or, as we might better say, there are two modes of operating—one by dead blows and the other by elastic or rebounding blows.

This I will attempt to explain without drawings or figures. If I succeed, you will remember whatever is new in the remarks; it will not pass away like a theorem or formula might.

In operating by elastic blows, the steam piston is cushioned at both the up and down stroke, and the action of a steam hammer corresponds to that of a helve trip hammer, the steam filling the office of a vibrating spring; in this case a hammer gives a quick rebounding blow, the momentum being only in part spent upon the work, and partly arrested by cushioning on the steam in the bottom of the cylinder under the piston.

Aside from the greater rapidity with which a hammer may operate when working on this principle, there is nothing gained and much lost; and as this kind of action is imperative in any hammer that has a "maintained or positive connection" between its reciprocating parts and the valve, it is perhaps fair to infer that one reason why most automatic hammers act with elastic blows is either because of a want of knowledge as to a proper valve arrangement, or the mechanical difficulties in arranging valve gear to produce dead blows.

In working with dead blows no steam is admitted under the piston until the hammer has finished its down stroke, and expended its momentum upon the work. So different is the effect produced by these two plans of operating, that on most kinds of work a hammer of 50 lbs., working with dead blows, will perform the same duty that one of 100 lbs. will, when acting by elastic or cushioned blows.

This difference between dead and elastic strokes is so important that it has served to keep hand-moved valves in use in many cases where much could be gained by employing automatic acting hammers.

Some makers of steam hammers have so perfected the automatic class, that they may be instantly changed so as to work with either dead blows or elastic blows at pleasure, thereby combining all the advantages of both principles. This brings the steam hammer where it is hard to imagine a want of further improvement.

The valve gearing of automatic steam hammers to fill the two conditions of allowing a dead or an elastic blow, furnishes one of the most interesting examples of mechanical combination.

It was stated that to give a dead or stamp stroke, the valve must move and admit steam beneath the piston after the hammer has made a blow and stopped on the work, and that such a movement of the valve could not be imparted by any maintained connection between the hammer head and valve. This problem is met by connecting the drop or hammer head with some mechanism which will, by reason of its momentum, continue to "move after the hammer head stops." This mechanism may consist of various devices. Messrs. Massey, in England, and Messrs. Ferris & Miles in America, employ a swinging wiper bar, which is, by reason of its weight or inertia, retarded, and does not follow the hammer head closely on the down stroke, but swings into contact and opens the valve after the hammer has come to a full stop.

By holding this wiper bar continuously in contact with the hammer drop, elastic or rebounding blows are given, and by adding weight in certain positions to the wiper bar, its motion is so retarded that a hammer will act as a stamp or drop. A German firm employs the concussion of the blow to disengage valve gear, so that it may fall and effect this after movement of the valves. Other engineers effect the same end by employing the momentum of the valve itself, having it connected to the drop by a slotted or yielding connection, which allows an independent movement of the valve after the hammer stops.

There is a kind of hammers not known in this country, or not employed at least, that may be called compound hammers.

Compound Hammers.

Another principle to be noticed in connection with hammers and forging processes is that of the inertia of the piece operated upon—a matter of no little importance in the heavier kinds of work.

When a piece is placed on an anvil, and struck on the top side with a certain force, the bottom or anvil side of the piece does not receive an equal force. A share of the blow is absorbed by the inertia of the piece struck, and the effect on the bottom side is, theoretically, as the force of the blow, less the cushioning effect and the inertia of the pieces acted upon.

In practice this difference of effect on the top and bottom, or between the anvil and hammer sides of a piece, is much greater than would be supposed. The yielding of the soft metal on the top cushions the blow and protects the under side from the force. The effect produced by a blow struck upon hot iron cannot be estimated by the force of the blow; it requires, to use a technical term, a certain amount of force to "start" the iron, and anything less than this force has but little effect in moving the particles and changing the form of a piece.

From this it may be seen that there must occur a great loss of power in operating on large pieces, for whatever force is absorbed by inertia has no effect on the under side. By watching a smith using a hand-hammer, it will be seen that whenever a piece operated upon is heavier than the hammer employed, but little, if any effect is produced on the anvil or bottom surface, nor is this loss of effect the only one. The expense of heating, which generally exceeds that of shaping forgings, is directly as the amount of shaping that may be done at each heat; and consequently, if the two sides of a piece, instead of one, can be equally acted upon, one-half the the heating will be saved.

Another object gained by equal action on both sides of large pieces is the quality of the forgings produced, which is generally improved by the rapidity of the shaping processes, and injured by too frequent heating.

The loss of effect by the inertia of the pieces acted upon increases with the weight of the work; not only the loss of the power, but also the expense of heating increases with the size of the pieces. There is, however, such a difference in the mechanical conditions between light and heavy forging, that for any but a heavy class of work there would be more lost than gained in attempting to operate on both sides of pieces at the same time.

To attain a double effect, and avoid the loss pointed out, Mr. Ramsbottom designed what may be called compound hammers, consisting of two independent heads or rams moving in opposite directions, and acting simultaneously upon pieces held between them.

It would be inferred that the arrangement of these double-acting hammers must necessarily be complicated and expensive, but the contrary is the fact. The rams are simply two masses of iron mounted on wheels that run on ways, like a truck, and the impact of the hammers, so far as not absorbed in the work, is neutralized by each other. No shock or jar is communicated to framing or foundations as in the case of single-acting hammers that have fixed anvils. The same rule applies in the back stroke of the hammers, as the links which move them are connected together at the center, where the power is applied at right angles to the line of the hammer movement. The links connecting the two hammers constitute, in effect, a toggle joint, the steam piston being attached where they meet in the center.

The steam cylinder which moves the hammers is set in the earth at some depth below the plane upon which they move, and even when the heaviest work is done there is no perceptible jar when one is standing near the hammers, as there always is with those which have a vertical movement and are single acting.

I will next refer to machine combination, or combined machines as we generally say. The connection between this subject and forging is not very apparent; indeed is wanting, because I believe steam and trip hammers to be almost the only machines that have not been combined with something else. The reason is, no doubt, that hammers will shake off almost any kind of attachment, even their own parts.

Machine Combination.

The reasons that favor combination of functions in machines, and the effects that such combinations may produce, are so various that the problem has led to a great diversity of opinions and practice among both those who construct, and even those who employ machines. It may be said, too, that a great share of the

combinations found in machines, such as those to turn, mill, bore, slot and drill in iron fitting, are not due to any deliberate plan on the part of the makers, so much as to an opinion that such machines represent a double or increased capacity. So far has combination in machines been carried, that in one case that came under the writer's notice, a machine was arranged to perform nearly every operation required in finishing the parts of machinery; completely organized, and displaying a high order of mechanical ability in design and arrangement, but practically of no more value than a single machine tool, because but one operation at a time could be performed.

First—By combining two or more operations in one machine, the only objects gained are a slight saving in first cost, one frame answering for two or more machines, and a saving of floor room.

Second—In a machine where two or more operations are combined, the capacity of such a machine is only as a single one of these operations, unless more than one can be carried on at the same time without interfering one with another.

Third—Combination machines can only be employed with success when one attendant performs all the operations, and when the change from one to another requires but little adjustment and re-arrangement.

Fourth—The arrangement of the parts of a combination machine have to be modified by the relations between them, instead of being adapted directly to the work to be performed.

Fifth—The cost of special adaptation, and the usual inconvenience of fitting combination machines when their parts operate independently, often equals and sometimes exceeds what is saved in framing and floor space.

Referring first to the saving effected by combining several operations in one machine, there is perhaps not one constructor in 20 that ever stops to consider what is really gained, and perhaps not one purchaser in a hundred that does the same thing. The impression is that when one machine performs two operations it saves a second machine. A remarkable example of this exists in the manufacture of combination machines in Europe for working wood, where it is common to find complicated machines that will perform all the operations of a joiner's shop, but as a rule only one thing at a time, and usually in an inconvenient manner, each operation being hampered and interfered with by another; and in changing from one kind of work to another, the adjustments and changes generally equal and sometimes exceed the work to be done. What is stranger still, is that such machines are purchased, when their cost often equals that of separate machines to perform the same work.

In metal working, owing to a more perfect division of labor, and a more intelligent manipulation than in wood-working, there is less combination in machines—in fact, a combination machine for metal work is rarely seen at this day, and never under circumstances where it occasions actual loss. The advantage of combination, as said, can only be in the framing and floor space occupied by the machines, but these considerations, to be estimated by a proper standard, are quite insignificant when compared with other items in the cost of machine operating, such as the attendance, interest on the invested cost of the machine, depreciation of value by wear, repairing and so on.

Assuming, for example, that a machine will cost as much as the wages of an attendant for one year, which is not far from an average estimate for iron-working machine tools, and that interest, wear and repairs amount to 10% on this sum, then the attendance would cost 10 times as much as the machine; in other words, the wages paid to a workman to attend a machine is on an average 10 times as much as the other expenses attending its operation, power excepted. This assumed, it follows that in machine tools any improvement directed to labor saving is worth *10 times* as much as an equal improvement directed to the economy of first cost.

This mode of reasoning will lead to proper estimates of the difference in value between good tools and inferior tools; the results of performance instead of the investment being first considered, because the expenses of operating are, as before assumed, usually 10 times as great as the interest on the value of a machine.

In view of these propositions, I need hardly say to what object machine improvements should be directed, nor which of the considerations named are most affected by a combination of machine functions. The fact is that if estimates could be prepared, showing the actual effect of machine combinations, it would astonish those who have not investigated the matter, and in many cases show a loss of the whole cost of such machines each year. The effect of combination machines is, however, by no means uniform. The remarks made apply to standard machines employed in the regular work of an engineering or other establishment. In exceptional cases it may be expedient to use combined machines. In the tool-room of machine shops, for instance, where one man can usually perform the main part of the work, and where there is but little space for machines, the conditions are especially favorable to combination machines, such as may be used in milling, turning, drilling and so on; but wherever there is a necessity or an opportunity to carry on two or more of these operations at the same time, the cost of separate machines is but a small consideration when compared with the saving of labor that may be effected by independent tools to perform each operation. The tendency of manufacturing processes of every kind at this time, is to a division of labor, and to a separation of each operation into as many branches as possible, so that study spent in "segregating" instead of "aggregating" machine functions is most likely to produce profitable results.

A great share of the alleged improvements in machinery, when investigated, will be found to consist in nothing more than the combination of several functions in one machine, the novelty of the arrangement leading to an impression of utility and increased effect.

Useful Information.

The "Eastlake Style" of Architecture.

This modern idea of architecture is of comparatively recent origin, being the outgrowth of conceptions originating with Mr. Charles E. Eastlake of England—not as a style of house architecture, but in connection with house furniture and internal decorations, as contained in a published work by Mr. Eastlake, entitled "Hints on Household Taste." Its peculiar features, however, soon became popular, not only in the sphere of the mechanical arts to which it was first applied, but in the external embellishment of buildings. This popularity, to a greater or less extent, has spread throughout all sections of the United States, and is now being greatly sought after upon the Pacific coast.

Unfortunately, it is simply a "style"—not a classified "order" of architecture, with defined principles of treatment, and rules of application and delineation. It is so unrestrained in its requirements, that the wildest caoeeits of the uneducated pretender may be imposed, and the most absurd and distorted features defended as "in keeping with the style." Delineated with accurate taste and good judgment, its application in the construction of a certain class of buildings may be made pleasing to the eye; but the excessive *gaucherie* indulged in by a class of reckless adventurers, who abuse the integrity of this new idea by extravagant, unsightly and ill-conceived creations of their own, is calculated to render it offensive and repulsive to those enjoying a fair degree of refinement in the æsthetics of architecture; this may cause its rejection even as a "style," except by a limited number who prefer oddities and peculiar things because they are such.

Could Charles E. Eastlake behold some of the extravagant delineations covered by his name, he would doubtless cry to the gods to blot out the monstrosities as hideous deformities. Judicious liberties and combinations are excusable in all orders and styles of architecture; but when they run rampant, with no regard to consistency, beauty or harmony, the doctrine and rules of propriety cease, and disorder and distraction ensue. The tendency of the "new style" runs in this direction, as it provides the basis upon which unqualified men may operate, and find a defense for their stupid creations.

"All can't invent and imitate,
No more than those who clothe us can create."

And so it runs with the Eastlake style. Those who can invent nothing meritorious in architecture can imitate the new idea; that is to say they can scribble up something that *looks peculiar*, and give it the name of Eastlake.—*California Architect.*

Bismuth in Soft Solders.—The fusibility of soft solders is increased by adding bismuth to the composition. An alloy of lead four parts, tin four parts, and bismuth one part is easily melted; but this alloy may itself be soldered with an alloy of lead two parts, bismuth two parts, and tin one part. By adding mercury a still more fusible solder can be made. Equal parts of lead, bismuth, and mercury, with two parts of tin, will make a composition which melts at 122° F., or an alloy of tin five parts, lead three parts, and bismuth three parts will melt in boiling water. In mixing these solders, melt the least fusible metal first in an iron ladle, then add the others in accordance with their infusibility. To cast stripe of solder, pour the molten metal on a flat surface of stone or metal.

Compressed Fuel From Coal Dust.—An interesting process for preparing compressed fuel from coal dust has been devised by Mr. L. Trallo. The dust is placed in an iron vessel provided with an archimedean screw and heated by means of steam. As the vapor is driven out of the dust, it is withdrawn from the apparatus by a large air pump, and at the same time a certain distillation of the volatile portions of the coal takes place, which renders it somewhat cohesive. It is then pressed into bricks of a suitable size by means of a steam ram. The fuel thus prepared is said to give general satisfaction in Germany, where the process is quite extensively used. A detailed description of the process of the mechanical welding together of various solids, will be found under the head of "Mechanical Progress" in this issue of the Press.

Improvement in Silk Winding.—An improvement in machines for winding silk has been patented by Mr. Henry H. Bartlett, of Watertown, Conn. The object of the invention is to soften raw silk and prevent generation of electricity in boiled silk during the process of winding. The invention consists in providing the winding machine with a steam generator for dampening or moistening the silk by a spray of steam, whereby the gum on the raw silk is kept soft, and in case of boiled silk it is rendered flexible while being wound, and the generation of electricity is prevented. The steam generator for effecting these results is arranged below the swifts of the machine, and is provided with perforations in its upper side for the distribution of steam to the silk on the swifts.

The Blue Color of Milk.—Herr Hansse, an authority in such matters, explains in a recent foreign scientific journal, the cause of the blue color in milk. He has discovered in milk which has become blue, a peculiar microscopical organism, known as *bacteria*, which multiplies with very great rapidity, and in so doing produces a peculiar blue matter similar to aniline. Milk which is kept in such a manner as to prevent the access of these organisms does not become blue. In view of these facts, it is evident that blue milk is unfit for food; and, although it may be eaten with apparent impunity by adults with vigorous digestive powers, it should never be given to children, whose weaker stomachs would be unable to resist the tendency to decomposition which such milk possesses.

Poisonous Honey.—In bad seasons honey in some localities is apt to be poisonous. This arises from the fact that in such seasons the bees are often obliged to gather it from poisonous flowers. Great care should be taken to remove all poisonous plants from the neighborhood of hives. In 1790 a great many people in Philadelphia died from eating honey gathered from the flowers of the kalmia latifolia. In good seasons the bees avoid poisonous plants.

The Vineyard.

Lemons for Cancer.

Written for the Press by Laura J. Dakin.

I knew Mr StC. when I lived in Massachusetts. He had a cancer on his right hand, and a terrible looking hand it was—as thick as four common hands. The cancer at the commencement resembled a wart, and they called it a cancerous wart. He had employed several physicians who tried everything they knew. Nitrate of silver was among the remedies prescribed; but nothing seemed to be of any avail. He was finally persuaded to go to the hospital, where they were supposed to have doctors who ought to fully understand his case. But he hated to go, he was getting quite old, and felt as though going to the hospital meant being shut up away from all his friends. Yet his hand was such a torture to him he consented at last to go. His daughter went over to the hospital with him and the doctors got about him and looked at his hand. One wanted him in charge, and another wanted him; and a third thought he could do best by him. There seemed to be a hint at amputation, and the poor old man got frightened and begged his daughter to let him go home and have his liberty. So home they went, and that evening his grandson was reading aloud from a newspaper and came across this one line: "Cure for a cancer: Lemon poultice."

"Why not try it for grandpa?" said the boy.

"It couldn't do any harm," replied his mother; "I think we will. Put on your cap and run down to the grocers and get a dozen lemons."

The lemons were soon brought, and the question was, how to prepare the poultice. As there were no directions she did the best she knew how—took two or three lemons, squeezed out the insides, removed the seeds and stirred in pounded crackers to thicken it. I think she warmed it so as to soften the cracker, and then applied it to the hand. Well, for three hours that man walked the floor in such agony as he never suffered before. But he would not have the poultice removed, and, at the end of three hours, the pain began to lessen. In the morning that poultice was taken off and a fresh one applied, which he kept on 24 hours. In trying to remove the fourth poultice it stuck so to his hand the daughter feared hurting him when she tried to remove it.

"Never mind," said Mr. StC., "just pull it off anyhow."

So she gave a steady pull, and out came the whole cancer, leaving a hole so large she could have set a coffee cup into it. The cancer was as black as ink; that might have been caused by the nitrate of silver which had been used.

The hand began to heal right away, and in a few months was so well he could work as hard as other men of his age. He cut and split cord wood for my husband that winter, and that, you know, is pretty hard on the hands.

I have written the above story of Mr. StC.'s case very nearly as I lately heard it from a friend, hoping it might lead some sufferer to try the "lemon poultice remedy" for themselves, as I know many give up in despair when they find they are afflicted by that dreaded scourge—cancer.

I knew another case, that of an editor in Vermont, who had what was said to be a cancer commence in his cheek. He immediately changed his diet to bread and milk and vegetables, avoiding meat and all pastry. Instead of getting larger the sore gradually decreased in size till it disappeared.

I have read a well authenticated account of a lady who had a cancer as large as a pullet's egg, who spread raw, mashed cranberries on a cloth and applied as a poultice, changing it three times a day, until the whole was drawn away—the cancer becoming softened and decreasing in size until completely cured.

"A jeweler had a cancerous pimple on his cheek, in using gold dissolved in nitro-muriatic acid he unconsciously rubbed the cancer with his impregnated fingers, and was surprised to find it speedily change appearance and shortly after disappear. Proportions one ounce acid to six ounces chloride of gold." This remedy might be used where poultices could not be applied. I copy it and the one before it, from an article in the *Toledo Blade*.

[The cases referred to by our correspondent were undoubtedly cancerous tumors and not true cancers. Among the tumors admitted by general consent into the order of cancers there are widely diffsrent degrees of malignity, the most malignant of which—the true cancer—seldom, if ever, yields to any other treatment than the knife, and then only when it is taken early, before it invades the lymphatic glands.

The practical distinction of these tumors involves the closest observations and a thorough knowledge of the anatomy and relations of the textures in which they arise, including also an intimate acquaintance with the minute structure of such growths, such as can only be obtained by a skillful use of the microscope.

There are many species of cancerous tumors which readily yield to simple treatment, and it is such cases generally which are largely talked about and advertised by quacks as wondrous cures. It is best in all cases of suspected cancer to apply to a well educated physician. If it should prove a simple tumor he will treat it better than any self-advertised "cancer doctor," and for less money. If it should prove a true cancer, you will always be the safer in such hands. A "quack" never yet healed a true cancer; and they never advertise their failures. Eds. Press.]

Is Dying Painful?

Our own observation fully accords with the opinion expressed by a physician, that in all ordinary cases there is little physical pain in dying. A previous correspondent has said that, "as a physical fact, in 99 cases out of 100 the act of death is suffering and agony which only those familiar with it can understand." To which the physician replies:

"I beg leave, as a physician, to object very decidedly to this statement. Since I began my novitiate on the battle fields of the South, I had been a frequent observer of the passing out of my fellow-beings, in army and navy, in large hospitals—civil and military, and in private life, and hence cannot help feeling that what I have seen must be a fair sample of the methods of dying peculiar to our race.

"The result of these sad observations, covering 18 years, is that the vast majority of persons do not find death 'suffering and agony.' Many suffer from the various illnesses from which they recover than most do in the article of death. A very large proportion become unconscious, and hence pass away without distress to themselves; while as regards those who retain a good measure of intelligence before life is extinct, I have been considerably surprised, considering my early religious teaching, to discern in them an almost general indifference to their fate.

"I have always supposed that, in spite of apparent mental lucidity, disease clouded the intellect so that apathy becomes the ordinary state of the dying. Of the few deaths I have witnessed, the mere onlookers might call horrible, there was good reason to believe the patient unconscious."—*New York Observer.*

Sleep and Sleeplessness.—Dr. J. M. Granville, in an interesting work on this subject, says, with reference to the difficulty some persons find in getting to sleep: "Habit greatly helps the performance of the initial act, and the cultivation of a habit of going to sleep in a particular way, at a particular time, will do more to procure regular and healthy sleep than any other artifice. The formation of the habit is, in fact, the creation or development of a special center or combination in the nervous system, which will henceforward produce sleep as a natural rhythmical process. If this were more generally recognized, persons from sleeplessness of the sort which consists simply in being unable to go to sleep, would set themselves resolutely to form such a habit. It is necessary that the training should be explicit, and include attention to details. It is not very important what a person does with this intention of going to sleep, but he should do precisely the same thing, in the same way, at the same time, and under as nearly as possible the same conditions, night after night, for a considerable period, say three or four weeks."

The Roseberg (Oregon) Land Office sold during October, 413 acres of land for cash, admitter 24 homestead entries, covering 3,259 acres, and 21 preemption fillings, besides timber entries etc.

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Passing Events.

This week is a broken one, onr annual set day for Thanksgiving coming in the middle of it. California has for this year, anyhow, great canse to celebrate the day, as it is now in an era of prosperity which hae been wanting for some time. Our only drawback is the nnfortunate controversy about the debris question. Mint Director Burchard, in his lately issued report upon the production of precions metals, estimates that the annnal output of gold in California during the next 10 years will he $15,000,000. He shows that of this amount the hydraulic mines will produce $10,000,000 per year if they are permitted to continue in operation. As we can not afford to lose ten millions, it is to he hoped the compromise will he arranged.

In this number of the Press we give two lectures on mechanical snbjects, hoth by workers in our midst. These are specially valuable to our mechanical readers.

From the mining regione the news is generally encouraging, except from the Comstock. At that center no bonanzas are announced, though that is where they are most anxiously looked for.

Excitement at Deep Creek.—We learn that there is quite a mining excitement at Deep creek, on the Utah line. Many claims have heen located there recently, and it is said that Salt Lake parties are becoming interested in many of the mines. A hoom is looked for ont that way in the spring.

But for the Indians, there would have been a large influx of people to Arizona and New Mexico this winter, eeeking investments. As it ie now, much of that capital will find employment in Mexico, especially Sonora, in which conntry there ie at present much interest.

Deep Gold Mining.

Tbe Australians seem to be going through an experience which may bs of benefit to us in California bsfore long. In soms of ths older gold districts in the colonies, as dspth was reached mining langnished. Then in several places they went to work with diamond drills, and by proving the ground qnickly and easily, have given a new impetns and inspired greatsr confidencs by proving the permanence of ths lodee at greater depth.

A recent report from there ehows that in the Crown Cross United mine at Stawell the diamond drill was set to work at a depth of 1,322 ft., and on boring 375 ft. further had pierced a recf of about 10 ft. in thicknss. The core has been tested, and is found to contain gold at the rate of 17 dwts. 3 grs. per ton, a prospect with which the company is eo satisfied that it proposes at once to sink for the reef. This work will occupy a year, and will cost about 4,000*l*. The discovery is entirely due to the valuable instrument of which miners have recently secured the use. Without it it is quite possible that the company would never have incnrred the expenditure necessary to sink a ehaft. This is not the only, thongh it is the most prominent, instance of the usefulnss of the drill as an instrument for prospecting. It is not long eince that its use in a claim at Hepburn led to discoveries which improved the quotable nature of the claim to the extent of 10,000*l*. At Stawell, we learn that the discovery in the Crown Cross United mine of a paying reef at a depth of 1,700 ft. has infused a new spirit of enterprise into mining work. The discovery in itself of paying quartz at this great depth is of vast importance as giving an enormons extension to tbe area of the known workable ground, and it immensely enlargee viewe of the permanence of gold mining in the colony. But the great point of interest is that the discovery was made by means of an instrument which reduces the cost of undergrond exploration in a great degree. It is quite natural that the utility of the instrnment should epecially strike the pnblic mind when it leads to a positive discovery. But it is easy to see that it is equally useful when its use indicates at a small outlay the inutility of expending money in any certain direction.

It is represented that the discovery of the Smeaton and Kingston gold fielde was due to diamond drille which seem to be finding great favor in the colonies. Gympie (Qneensland) is turning ont splendid returns from the new finds at the deeper levels, and one mine which was offered at 500*l*. within the last 18 months is now worth 150,000*l*., and 120,000*l*. casb was refused last month for it.

Here in California many people are prejudiced againet the diamond drill on account of the way it has been used in Nevada silver mining in times past, the "insiders" baing able by means of it to hold the key to the situation. It has proven itself so very useful, however, of late years that the wonder is the drill is not more frequently used in prospecting in gold mining regions. The conclusions reached in the work in Australia with reference to the gold ore at great depthe will encourage many persons here.

Nevada Bullion.

According to the statement of the Connty Recorder of Storey conty, the bullion yield of the Comstock mines for the qnarter ending September 30th, was as follows: Total tons of ore and tallinge, 29,862 and 1,462 lbs. Total gross yield, $251,495.99. Total net yield, $44,228 97. Total tax, $1,822.48. Average grosa valne of ore per ton, 14.47. Net yield of ore per ton, $2.87. Average tax on ore per ton, about 12 cents. Average gross valne of tailings per ton, $4.37. Net yield of tailings per ton, 55 cents nearly. Average tax per ton on tailings, 2 134 1,000 cents. A comparison of the returns for the last two quarters gives the following results: Decrease in ore extracted dnring the last quarter, 9,780 tons. Decrease in gross value of ore. $199-269,28. Decrease in net yield of ore, $39,732.17. Decrease of tax on ore, $1,897.24. Increase in tailings redneed dnring the last quarter, 13,253 tons. Increase in grose value of tailings, $55,-602.62. Increase in net yield of tailings, $7,-538.78. Increase in tax on tailings, $285.44. Total decrease in tax on the net proceeds of ore and tallinge extracted and reduced for the past qnarter over that ending Jnne 30th, $1,611.80.

A stampede is in progress toward Beni river, in Bolivia, nnexplored nntil last winter, when E. A. Heath ascended it and discovered vast forests of cinchona and cacutchne. Ten thousand men have gone there, and the export of rubber has risen from 15,000 to 75,000 lbs., with promises of 6,000,000 next year. Dr. Heath ie sanguine of finding rich deposits of the precious metals and medicinal plants along the Madre de Dios.

Says the Bodie *Free Press;* "It has besn well observed that as operations become more centralized and general, co-operations will entcr into the future work and plans of mining. Isolated mining companies have been compelled to erect machinery for treating their ores, and many disasters have been the result. One shaft, pump, hoisting works of large capacity will do the work of a number of smaller ones, cheaper and better."

Lectures to Mechanics.

We give in tbis issne of the Mining and Scientific Press, full reports of lectures delivered to the mechanics of San Francisco by John Richards, of the S. F. Tool Co. and G. W. Dickis, of ths Risdon Iron Works. Both of these lectures are by practical men on their specialties, and are worthy of careful perusal by all psrsons interested in mechanics.

We are of the opinion that tbe single course of lectures of which these form a part will call the attention of the citizsns of this city to the great need of a regular course of snch lectures to be given each winter to the yonng people of the town. There are plenty of gentlemen who could be found to give a portion of their time to such a purpose provided they can see any practical results are likely to follow. When the lectures are given in plain, simple language, and not so scientific as to be beyond the reach of an ordlnary mechanic, they are mucb more nsefnl than when too "deep." And they must be given in a place where mechanics will be likely to go. Big halle, with committees, and parade and show, gather a lot of people who want to advertise themselves, but do not gather the right kind of hearere. The lectnres now being delivered, have been so far just what was wanted.

Portable Drilling Machines.

For the pnrpose of producing a portable self-acting adjustable feed drilling machine that can he readily adapted and clamped to heavy pieces of machinery or iron bridge work, for the purpose of drilling or boring holes in the same, at a speed proportionate to the hole to he drilled, an ingenious arrangement is proposed hy Messrs. Lees, of Hollinwood, Manchester. A euitable frame supports the drill spindle and accompanying driving apparatns, which are secured to a horizontal arm, which arm, when required, will revolve so ae to point the drlll spindle to almost any angle. The revolvlng motion of the drill spindle is obtained hy the application of a handle or pulley and a pair of ordinary bevel wheels, one of which is fixed to the handle or pulley and the other to the drill spindle. The stud carrying the handle or pulley and its bevel wheel may, with equal convenience, occupy their several positions in order to facilitate the drilling of the work at difficult angles. The self-feed of the drill spindle is effected hy the application of four small differential spar wheels fixed above the bevel wheel on the drill spindle, two of whicb revolve with, and are on, the drill spindle, and the remaining two differential wheels are on a stud parallel to it, which, with the wheels keyed on it, is lifted when the drill is to be put out of gear. The lifting of the stud and the two wheels thereon enables the operator to put the tool quickly to or withdraw it speedily from its work.

Thanksgiving.

We did not need the proclamation of a Governor and a President to make the people of California give a day this week to thanksgiving. There is need enough for rejoicing in our improved prospects, onr present prosperity and our rsnewed vigor and enterprise.

True, jnst at present California mining interests are to some extent under a clond owing to the unfortunate debris contest; but aside from this everything is harmonious. Our mechanical progress is very rapid. All onr fonndries are filled with work; new industries are springing up on every hand. It is gratifying to one who has full faith in prodnctive effort as the only true basis of prosperity, to see that the whole population are looking no more for a "lively stock market" to advance their trade and manfacturing interests, but are with one accord attributing the present general activity to the downfall of the power they once courted. It is a signal triumph for industry. It alone wonld give occasion for a general thanksgiving.

The theme is one which thie week commends itself to many; and we do not therefore devote much space to it. Nevertheless, we, in common with others, feel like congratulating onrselves that on this occasion particnlarly, we can enter into the joys of thanksgiving with a full sense that we have a great deal to be thankful for.

The Garfield Shaft.—In the last issue of the Press we described the natnre of the machinery which is to be built for the new Garfield ehaft, at the New Almaden mine, Santa Clara county. Instead of the rope there described, after consultation with experienced mining men, it is thought best to nse flat crucible steel wire rope 3½ inches wide by ⅜ thick, of which the working load is 12,000 pounds and the weight per 100 feet, 242 pounds. Shaft will have one compartment for hoisting, one for pnmps. Two reels will be reqnired, one carrying a tail rope in pnmp compartment as a counter balance.

The Mt. Pleasant mine, near Grizzly flat, El Dorado county, has a new 20-stamp mill, with all modern improvements, a set of hoisting works, etc. It now belongs to Eastern parties.

Marine Engineering on the Pacific Coast.

The following lecture was delivered at Capt. McNevin's nautical school on Thursday evening of last week by G. W. Dickie, of the Risdon Iron Works:

Aftsr consenting to taks part in this course of lectures, I felt some difficulty in choosing a subject npon which I could talk to you in an intsligent way, and one in which yon would feel interested. Taking it for granted that the most of my hearers to-night are connected with mechanical pursnits, and that you are hsre expecting to learn something that will be of nse to you in pursnit of your daily calling, I felt that my subject must not only treat of some branch of mechanical engineering, but that I must endeavor to point out how *you*, who are to help in its future development, can best prepare yourselves to take part in advancing that branch of our honorable calling that I have chosen for my subject to-night, namely—"Marine Engineering on the Pacific Coast." The greater part of my work here during the past 10 years has been devoted to this branch of engineering; and while circumstances have compelled me to study up and execute important works in other branches, I have always considered that the marine engine was my special etudy, and I trust that the day is not far off when it will be *here* (as it is in the older conntriee) considered enough if a man is proficient in one branch of his profession. My advice to the young men who hear me to-night, and who may have large ideas as to the extent of the field they will be able to cultivate in machanics, is to try a little patch first.

Our First Knowledge

Is so apt to lift us up, that we think our vision can grasp the whole mechanical field; the beginner is generally more satisfied with his progress than he who has long been in the work. Those thinge in mechanics, which, to the beginner, like the stem of a tree, seem simple and easily grasped, spread away heneath into interminable roots, where we can never count them all, nor reach the end of any one. Just try to master a single subject, and you will find it so. The road becomee longer and the field wider as you proceed; side pathe strike off; related sciences penetrate yonr special subject of etudy, which must be known if you are to understand your own department thoronghly, till yon feel how brief is life, and how long is knowledge. The more one knows and the longer one works, the more he feels it, and the wider the application of mechanical science growe as a whole, the less is the portion that can he overtaken hy each individual. Each mind works like a glow-worm, with its little spot of light around it, hut there is no one broad enough to pour illumination on the whole.

This branch of engineering that we are to consider to-night will, in the future, he the most important one on this coast. It will give more positions of trust than any other to the young engineers who are preparing to make their presence felt among us, and it is to those young men whom we expect by-and-by to

Design and to Handle Our Steamship Engines,

That I wish more especially to address myself to-night. I do not expect to he able to tell you much that is new; in fact, I have no desire to do so. My aim will be to point out the direction in which you are to push your inquiries. We will therefore consider marine engineering on the Pacific coast: First, with reference to design—the drawing-room; second, construction—the ship; and third, management—on board ship. There is perhaps no richer field for the clever designer to labor in than that of

Designing Marine Engines.

Every vessel he is called upon to provide engines for, needs special treatment; in fact, the vessel throughout, hoth hull and machinery, should he a homogeneous design. Yonr design ehould be in harmony with its surroundings; in fact, it shonld be *such*, that an engineer of taste, boarding the vessel you have engined, should find just what he expected in the engine-room of euch a vassel. It is this feature of harmony in design that makes the donhle-ended boilers and those heautifully deeigned three-cylinder engines of Mr. Kirk's so appropriate when worked into the lnngitudinal section of a vessel of great length in proportion to depth and breadth.

Not only should your engine, in form and type, conform to the main fixtures of the vessel it is to propel, hut in finish it ehould harmonize with the general finish and appointments with which it is surrounded.

Another point to he observed in general deeigning, and which I will advert to now, before enteriog into details, is this:

Make Provision for Light

In your engine and fire-rooms. Here yon will encounter your first and most determined opposition of the ship owner, or, more properly speaking, his superintending captain. I am most decidedly of the opinion that many steamship disasters and much rapid deterioration is induced by darkness in the engine-rooms and fire-rooms of many otherwise well-appointed vessels. Dirt accumulatee in dark places, where It would not be allowed if there were light to make it visible; proper inspection would he had of parts that no inspecting eye ever sees hecanse of the darkness and dirt. Make your design with ample provision for light, and fight for deck room to obtain it. Remember that yon will have to compromise and plan to do with less than you call for in yonr design; therefore

begin large enough to be able to make concession for peace.

We will now consider the leading types of marine engines for ocean service, and for two reasons we will first take paddle, or, as you term them,

Side-Wheel Engines.

First, because of their age and respectability; and second, because I believe there is a future for this class of engine on the Pacific coast. In America, there is but one type of paddle engine in general use at present, and for large radial wheels, turning slowly and yet attaining considerable piston speed, the American beam engine has had a long and honorable term of office, and for certain purposes should still be retained. But if a fast ocean passenger service should be required on this coast, as it will be when our coast population increases, then long, low saloon steamers will be built, maybe of California steel, with fast-running feathering-wheels. I have advocated such vessels for some years past, and I doubt not but some of you will take part in the building of them before many years have gone by.

In that class of engines where the cylinders are placed directly under the shaft, I would give the first place to

The Oscillating Engine.

This class of engine was first built by Henry Mendely for the Thames river steamers about 1822 or 1824. His son, Joseph, was the first to construct oscillating engines with slide valves worked by eccentrics, about the year 1827. This arrangement of valve gear came so perfect from his hands that no attempt has been made to improve upon it. The engines of Her British Majesty's yacht, *Osborne*, are, I think, the largest pair of oscillating engines in use. They were built by Mandely & Sons in 1870. The cylinders are 100 inches in diameter and 8-ft. stroke, and make 32 revolutions, indicating 3,374 horse power. There are at present some fine specimens of compound oscillating engines being built by Mandely for continental boats of the London, Chatham and Dover railway. Having in view the advantage of a perfectly steady and uniform motion for feathering wheels of great power, I would prefer, if my customer's purse was deep enough, to adopt the compound three-cylinder type of oscillating engine. In making some preliminary studies for a set of engines lately, to work up to 2,500 horse power, I adopted 1·42 inch high pressure, and 2·62 inch low-pressure cylinders, 7-ft. stroke, 35 revolutions, steam 90 inches. This gave a light load on the trunnion and a very equal distribution of power throughout the whole revolution. In this case, the high-pressure cylinder would be set in the center, with a low pressure on each side; the cranks would be set at 120°; the power would be transmitted from the engine to the wheel shaft through a drag link. In this case, the high-pressure cylinder occupies the place usually assigned to the air pumps and condenser; these I would make independent of the main engines, as also the feed pumps. I would also employ piston valves, two on each cylinder; this enables you to balance the cylinders properly on the trunnions. I would also employ in all oscillating engines the center of oscillation of which is directly under the shaft, two piston rods to each cylinder; these should be far enough apart to take the crank in between them and form the cup bolts for the brasses. This plan secures the necessary rigidity, fore and aft, and gives more burning surface in the neck bushes. There is no better study for a young designer who aims at a high degree of proficiency in his profession, than the oscillating marine engine, and I will leave it to you with this warning, never attempt to make a cheap oscillating marine engine. The boldness of design required, and the grace of motion that accompanies a well designed oscillator, do not admit of cheapening. The best efforts of such men as Mandely, Pen & Elder, have been lavished on this engine. They loved it, and it comes to us with many marks of their devotion. In fine, there is no place for second or third rate oscillating engines; it is either a grand piece of marine engineering, or it is a small motor to drive a donkey pump or small hoisting machine.

Another class of paddle engine, with the center line of cylinder directly under the shaft, and which deserves some attention is

The Staple Engine.

The principal feature in this engine is the return motion, and, as the name implies, they are tall structures. An engine of 8-ft. stroke would measure from the bottom of cylinder to the top beam of the guides 48 ft., and the piston rods would be about 32 ft. long. The Messrs. Todd & Magregor, Glasgow, made this form of engine a study and built many fine examples; and at present the plan is again revived in England in the shape of a six cylinder compound engine to which we will again refer further on. Some of the finest and largest examples by Todd & Mugregor were fitted with four piston rods, two being on each side of the cranks. The guides were carried clear down to the entablature and fitted with a guide block for the piston rods, about 10 ft. below the main guide block on the crosshead. This gave great stability to the rods when on the up stroke. The entablature of necessity standing close down on the cylinder covers, required some special designing, in order to make the piston accessible. In designing an engine of this sort of considerable power I should prefer to adopt the three cylinder compound, with the high pressure in the middle, the valve sheets on the after side of the cylinders, and the condenser on the forward side, an ordinary bucket-lift air pump having the full stroke of the engine could be used in this design. Feed, bilge and circulating pumps should all be independent. A six-cylinder staple engine is being built in England just now of considerable power. There are two nests of three cylinders each, the high pressure in each nest being placed directly under the crank, and the two low pressures placed fore and aft of it. There are four piston rods to each crosshead, two from the high pressure piston, and one from each of the low pressure pistons—the crank rods swings in a cage of piston rods. The condenser stands fore and aft in the center line of the engine, the pumps being long stroke bucket lifts, it is claimed for this arrangement that fore and aft stability is obtained, and span for the guide housings, without adding special framing for the purpose; but if the condenser be worked into the framing of the three-cylinder engine, as much fore and aft stability can be obtained, and besides secure a well balanced engine, the cranks being disposed at 120°. This is important in heavy paddle engines, especially when designed for feathering wheels and high speed. We have extended our remarks on the staple engine not because we expect this class ever to obtain favor on this coast, but because it presents many points of interest, for a young designer, affording more opportunities for design in trussed frame work than any other form of paddle engine.

As we are considering engines for ocean service it will not be necessary to refer to the horizontal form of paddle engine as in sea-going vessels. The center of gravity of this form of engine would be too high to make a practical design. The regular form of direct slide and connecting rod engines are therefore more or less inclined. Where the vessel has a considerable depth of hold, the cylinder may be placed diagonally fore and aft of the center line of shaft, as in the four-cylinder compound paddle engine by John Elder & Co., several of which were sent out to the Pacific Coast of South America.

The usual form of diagonal engine is the simple compound, one high and one low pressure cylinder, cranks at right angles, many fine examples of which have been built lately for service on the English coast and between the

Morgan's Feathering Paddle.

various ports on either side of the English Channel. In engines with vertical cylinder not under the shaft line, the form you are most familiar with, is

The American Beam Engine.

The construction and design of which you have examples at work all around from which you can gather materials for new designs. Study new frames for this class of engine, also the best method of building compound beam paddle engines. Amongst the engines with vertical cylinders, the side lever long held a prominent place. Those built by Napier for the Royal Mail Steamship Co. were fine examples of engineering, but the room they occupy and the great weight of framing necessary, have relieved the ponderous style from active service. The handsome elevations they made still give them a first place in our engineering picture books—where I trust they may find a place for many years to come to stimulate the taste and inspire the grand ideas of our rising engineers.

Before closing my remarks on the various forms of paddle engine, there is another form of engine I would like to notice briefly, on account of its simplicity and cheapness, and I think also its efficiency for moderate powers up to say 700 horses, indicated, viz.:

The Grasshopper Engine.

In this type of engine the cylinders are generally placed far enough aft of the shaft for the crank to clear them as it rotates, the vibrating levers are generally centered twice the length of the stroke forward of the center of the shaft. The full length of lever being three times the stroke of piston, thus for a 9-ft. stroke of piston, the crank would be 3 ft. center or at that point the stroke would be 6 ft. The air pump is placed midway between the connecting rod and the fulcrum of the lever, that would be 3-ft. stroke for the air pump, (sketch). Of course, I would not adopt such a plan for very large engines, as the unbalanced weights would be too great for the steam distribution to correct, but a very pretty and cheap design could be worked out on this principle for small powers—which I trust some of my young friends will set about doing these long evenings.

Having thus briefly reviewed the leading features of the various forms of engine employed in paddle vessels, we come now to the

Consideration of the Paddle Wheel Itself.

Every propelling instrument whether it be a paddle, a screw, or a pump, drives a ship by means of the forward reaction of the current of water which it sends backward. That reaction is transmitted through the propelling instrument to the ship, and when the ship moves at a uniform speed it is equal and opposite to the resistance of the ship.

Of different kinds of propellers in practical use that which has the simplest action is the feathering paddle, because it drives a stream of water directly astern, or nearly so. The radial paddle acts less simply and less economically, because part of the stream of water on which it acts is driven obliquely upwards, and the reaction due to the vertical motion of that water has no effect in propelling the vessel. The screw drives water astern in various directions more or less oblique; and the reaction due to the transverse component of the motion of each particle of water has no effect in propelling the vessel. The most important constant quantity in calculations respecting the action of propellers of every kind is the mass of a cube ft. of sea water, that is its weight in pounds, divided by the accelerating effect of gravity in a second. When velocities are expressed in ft. per second, the value of that constant is almost exactly 2. When velocities are expressed in knots per hour, the coefficient $5\frac{3}{4}$ is to be used, being $2 \times$ the square of the number of ft. per second in a knot per hour. The reaction of the stream of water acted upon by any propelling instrument is the product of 3 factors: 1st. The mass of a cube ft. of water. 2d. The number of cube ft. of water acted on in a second. 3d. The velocity in ft. per second impressed on that water by the propeller.

The number of cube ft. of water acted on in a second, is to be calculated by multiplying the sectional area of the stream by its velocity relative to the ship. This calculation might be made either before or immediately after the action of the propelling instrument takes place. The latter mode of calculation is the more convenient, because it appears from the results of experiments that the sectional area of the stream immediately after the action of the propeller is either very nearly or exactly equal to the area of the propeller itself projected on a thwartship plane; that is for feathering paddles simply the area of a pair of floats. For radial paddles the breadth multiplied by the depth of immersion; and for a screw the area of the disc less that of the boss. The velocity of the stream relative to the ship is the sum of two quantities; the velocity of the ship, and the velocity relative to still water of the stream driven back by the propeller, in other words, the apparent slip of that stream. For feathering paddles, the slip of the stream of water driven back is the same with that of the paddle floats themselves, because they press directly backwards on the water; but for a radial paddle wheel and a screw fan, owing to the obliquity of their action, the slip of the stream driven back is less than the slip of the paddle or screw. In the proportion of the square of the cosine of the obliquity of their surfaces to a thwartship plane, a ratio which is different for different parts of the stream of water acted on by the same paddle or screw. Having said this much on the principles of the action of propellers in general, we will for the present devote our attention to the paddle wheel and endeavor to set before you the leading principles that should guide the engineer in designing a

Pair of Feathering Wheels.

To determine the proper area of a pair of feathering floats for the paddle wheels of a given vessel to be driven at a given speed, with a given ship, the paddles working in water that is not sensibly disturbed by the ship. To solve this question the engineer must know, first, whether the vessel is so proportioned that her resistance depends on her augmented surface only. We cannot give the time at present to investigate the principles of skin resistance; this would lead us into an inquiry beyond the scope of this lecture, You must therefore be content with the statement that augmented surface is the whole area of the under water portion of the hull augmented by a multiplier, which is 1 + the means of squares of sines of obliquities of the water lines—that is, the fuller the lines of the vessel, the sines of obliquity would be greater and the augmented surface increased. Being satisfied, therefore, that the vessel is properly proportioned for the proposed speed, we divide the augmented surface by the ratio which the intended ship bears to the intended speed of the vessel; by the ratio which the intended speed of the centers of the floats bears to the intended speed of the vessel, and by the constant 566, the quotient will be the area required. In different conditions of the ship's bottom the constant division may have different values, which in the present state of our experimental knowledge, may be taken as ranging between 500 and 600. Take for example the steamer *Orizaba* (to which we lately fitted feathering wheels), her augmented surface is 8,560 square ft. Intended ratio of slip to speed of vessel 0.28, intended ratio of speed of centers of floats to speed of vessel 1.28—then $8,560 \div 0.28 \times 1.28 \times 566 = 42$ square ft. required area of a pair of floats giving 21 square ft. for a single float, which is the actual size of the float fitted. Having found the size of float or propelling instrument, we must now find the power required to drive the paddles. The prime factor in this problem is

The Resistance of the Vessel

in lbs. at her intended speed. Now the principles of resistance like that of augmented surface lie outside of the scope of this lecture, but its computation at a given speed is performed by multiplying the augmented surface by the square of the speed in knots and dividing by 100 for a clean bottom. Having obtained this resistance we must multiply this resistance of the vessel in lbs. by the speed of the paddle floats relative to the vessel, that is by the speed of the vessel plus the slip of ft. per second. This will give the required power in ft lbs. per second. Allowance must be made for the power wasted through slip, through wasteful resistances of the propeller, and through the friction of the engine. In making this allowance the practical engineer must depend upon his own experience. It of course varies in different ships, propellers and engines. In my own experience I find that it varies little from 60 %, so that as a probable value of the indicated power required in a well designed vessel we may multiply the net power by 1·6. The marine engineer, as we have just seen, has much to do with the

Hydraulics of Ship-building.

He should therefore accustom himself to the values and terms that are most convenient for the computations he requires to make. Now, an indicated horse-power is 550 ft. pounds per second and a knot is 1.688 ft. per second, therefore, an indicated horse-power is $550 \div 1.688 = 326$ knot lbs., nearly, or 326 lbs. of resistance overcome through one nautical mile, in an hour. If we estimate, then, the net or useful work done in propelling the vessel as equal to the total work of the steam, divided by 1.60, we shall have $326 \div 1.60$, in round numbers 200 knot lbs. of net work done in propulsion for each indicated horse-power. Hence, we have the following rule: Multiply the augmented surface in square ft. by the cube of the speed in knots and divide by 20,000, the quotient will be the probable indicated horse-power. The divisor in this rule, 20,000, expresses the number of square ft. of augmented surface which can be driven at one knot by one indicated horse-power and is called the coefficient of propulsion.

Having thus briefly stated the principles of propulsion common to all classes of propelling instruments, we may now turn our attention to the construction of a feathering paddle wheel. Having determined the area of the floats by the methods described, the breadth or length rather is commonly from twice to three times the depth. They are usually like radial paddles, rectangular and oblong—and sometimes have the corners rounded; and are made sometimes of wood (usually elm or pine) and sometimes of plate iron or steel. They ought always to be champered to a thin edge all round. The extreme depth of immersion of the lower edge of a feathering paddle ranges from 1 and ⅓ times to twice its depth. The pitch of the paddles or distance between them measured on the circle which passes through their centers of oscillation in some of the most successful examples, is from 1.6 times to double their depth or nearly so, and as this appears to give a sufficient hold of the water, a closer pitch is unnecessary, although I have met with examples in which the pitch is but little greater than the depth.

The mean radius of the wheel measured from the axis to the centers of the paddles, is seldom less than twice, or more than 3 and ½ times the depth of the paddles. A feathering paddle wheel continues to work efficiently at a deeper immersion, in proportion to its outside radius, than a radial paddle wheel, having in some cases been found to answer very well with half of its outside radius immersed. In the usual mode of framing feathering paddle wheels the centers and sets of arms are two in number only, and the arms in each set are equal to the number of paddles. The arms are commonly made to stand obliquely to the axis, so that they lie in two "dished" or concave conical surfaces. This enables the bearing for the paddle shaft journal which is carried by a bracket or projecting part of the vessel's side to be brought nearer to the center of gravity of the wheel than would otherwise be possible. There is sometimes only one ring to each set of arms immediately inside the circle of paddle, this is the case in these built for the *Orizaba*, and then the outer ends of the arms form curved spans to carry the bearings of the paddle journals.

In other examples there are two rings to each set of arms, one inside the circle of paddle and one outside; the intermediate parts of the arms being straight and having short spans projecting from them. The latter construction is no doubt the best for rough and stormy ocean navigation, because in the event of the feathering paddles being destroyed or disabled, radial paddles can be fixed on the parts of the arms between the two rings. Each of the paddles has fixed on its back two journal boxes lined with lignumvatie bushes or steel bars covered with brass secured in the spare of the arms. From the back of each paddle projects a lever, called the stem or stem lever, of a length equal to about 6 10° of the depth of the paddle. The ends of the stem levers are connected by means of guide rods of equal length, with the eccentric collar, which turns freely, either about a center pin fixed to the spring beam of the paddle box, or about an eccentric disc fixed to the side of the ship, and large enough to contain within it the paddle shaft and its bearings. The latter

(Continued on Page 356.)

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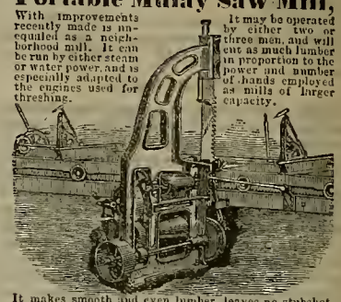

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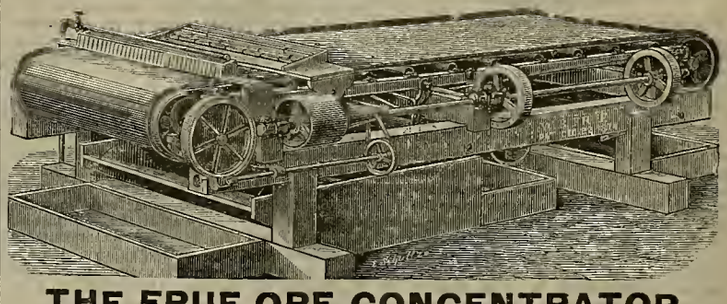

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Assaying in all its Branches.
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Working Tests (Practical) Made.
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We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.
Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
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Mining Engineer,
Late Director of the United States Bureau of Statistics Mining Commissioner for the United States Monetary Commission, etc., No. 216 Sansome St., San Francisco. Cable address—"Del Mar, San Francisco." Branch Office, 61 Broadway, New York. Cable address—"Del Mar, New York." London Agency: H. Stodes & Co., 24 A, Southwark St., S. E. Cable address—"Del Mar, London." Paris Agency: J. H. McDonald & Co., 13 Rue St. Lazare. Cable address—"Del Mar, Paris."

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METALLURGICAL WORKS,
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Mines examined and reported on.
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Mining Engineers & Assayers,
Examination of and Reports on Mines a Specialty.
No. 331 Montgomery Street, Room 28.
SAN FRANCISCO.

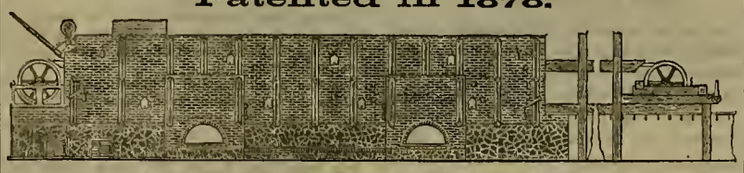
NOTICE.
The office of the STETEFELDT FURNACE CO., having been removed to New York, parties wishing to obtain information in San Francisco about the Stetefeldt Furnace will apply to Messrs. Prescott, Soott & Co., Union Iron Works, San Francisco. C. A. STETEFELDT

SHEET IRON PIPE.

FRANCIS SMITH & CO.,
Manufacturers of
THE PATENT CHANNEL IRON WHEELBARROWS.
THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand
SHEET IRON PIPE.
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Artesian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.
Office and Manufactory, 130 Beale Street, San Francisco.

SHEET IRON PIPE.

THE O'HARRA
CHLORIDIZING FURNACE.
Patented in 1878.



SIDE ELEVATION OF THE O'HARRA FURNACE.
This Furnace is Constructed with two SEPARATE HEARTHS, one for DESULPHURIZING and one for CHLORIDIZING the Ore.
BOTH PROCESSES ARE PERFORMED AT ONE OPERATION.
An endless chain carrying conveyors or scrapers passes continuously through over both hearths, going one way through one chamber and the other through the other chamber. By this means the ore is fed and discharged at the same end of the furnace.
A cheap Furnace to build and to run.
The process is essentially the same as the well-known Freiberg process; but this mechanical devices applied to the furnace and the peculiarity of its construction enable the inventor to thoroughly desulpburize and chloridize the ore to a higher percentage than other furnaces, and with less cost for fuel and labor.
At Washoe and Ophir Tailings Mill it costs $1.10 per ton to work 40 tons in 24 hours.
At the Exchequer Mill, Alpine County, 20 tons are worked in 24 hours, at a cost of $2.61½.
Lewis Chalmers, of the Isabella O. & S. M. Co., Silver Mountain, Alpine Co., says: The O'Harra Furnace did all that is represented in the MINING AND SCIENTIFIC PRESS, roasting and chloridizing at the figures there given, antimonial and arsenual sulphurate of silver up to from 84% to 95% of the assay.
SEND FOR DESCRIPTIVE CIRCULAR TO
WHITNEY, VEASEY & CO.,
Carson City, Nevada.
Agents for San Francisco, KUSTEL & CO., 318 Pine Street.

MOREY & SPERRY,
MANUFACTURERS OF
Gold and Silver Grinding and Amalgamating Machinery
HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.
IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.

Stamp Mils, Rock Breakers, Crushing Rolls, A lgamalin Pans and Separators for Gold and Silver Ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill supplies Iron Work complete for Wood Frames, also
SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.
☞ Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
MOREY & SPERRY—Warerooms, 92 and 94 Liberty St., N. Y.

LEFFEL'S IMPROVED WATER WHEEL.
PRICES REDUCED!
PATENTS REISSUED 1868.
This "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.

Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
JAMES LEFFEL & CO., Springfield, Ohio, and 110 Liberty St., N. Y. City.
PARKE & LACY, Sole Agents, 21 and 23 Fremont St., S. F.

STEEL CASTINGS
FROM 1-4 TO 10,000 lbs. WEIGHT.
True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
CRANK SHAFTS, SHOES, DIES and GEARING specialties. Circulars and Price Lists free. Address
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SMELTING and LEAD CO.,
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HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
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ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

Mines and Mining Properties Solicited for Sale.
I have unexampled facilities for rapidly placing Mines and Mining Properties, and claims of
Ascertained Value
Upon the Market, through my Branch Offices in
NEW YORK, BOSTON, PHILADELPHIA, CHICAGO, ST. LOUIS, LONDON, ENGLAND.
OWNERS OF
Meritorious Mines and Prospectors
WHO HAVE NOT THE MEANS TO PROPERLY DEVELOP THE SAME MAY FIND A PURCHASER THROUGH MY OFFICE.
If You Have a GOOD MINE, or a GOOD PROSPECT for sale, apply to me in person or by letter.
JAMES. A. MARS,
45 to 49 Merchants' Exchange, California St
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REFERENCES:
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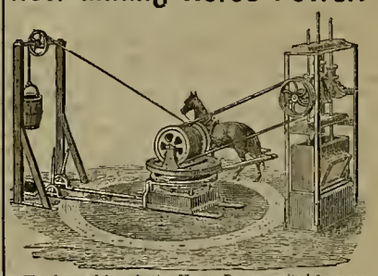
Louis A. Garnett, Capitalist, S. F., Cal.
Daniel Meyer, Capitalist, S. F.
Prof. Thos. Price, M. E., S. F., Cal.

New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
Agent and Manufacturer of Mining Machinery
38 and 40 Main St., S. F.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

Marine Engineering on the Pacific Coast.

(CONTINUED FROM PAGE 353.)

plan which must be adopted where the wheel has outboard hearings, is nsed on the *Orizaba;* hut from the difficulties attending the working of such a large eccentric ring it should never he adopted in a new deeign.

All the guide rods except one, are jointed hy means of rounn pins to the eccsntric collar from which they radiate, that one called the driving rod, is rigidly fastened to the collar hy holts, or otherwise, and serves to make the collar revolve once for each turn of the paddle wheels. This is the mechanism used in Gallowery, otherwise called Morgan's feathering paddle wheel, and ie the only kind of feathering mechanism that is extensively used iu practice. The following is the best

Method for Finding the Center

About which the collar with the guide rods ought to turn: Let A, (in the drawing), represent the center of the paddle wheel; B C, the vertical diameter of the circle in which the centers of the paddle journals revolve. The most efficient kind of motion for the paddles to have is such, that in going into and coming out of the water, they shall move edgeways relatively to the current of water whicb their action produces—that ie relatively to current moving horizontally astern, with the velocity of the point B. In order that such niay he the motion of the paddles, their surface during their action on the water, ehould he parallel to lines radiating from C. We therefore draw W, W, to represent the low water line, cutting the circle B C, in D and E, then draw the straight lines C D and C E, these will show the proper positions for paddles leaving and entering the water respectively. The line C B already shows the proper position for a paddle at its deepeet immersion, which is vertical.

Draw D G,=B F,=E H, about 6·10° of the depth of the paddle, to represent the three corresponding positions of the stem lever, which is commonly perpendicular to the paddle, hut may, if convenient, he placed slightly obliqne to it, then find the center, K, of a circle travereing the three points G, F, H, that will be the proper positiun for the center of the collar, and K G=K F,=K H will esch he equal to the radius of the circle of pins in the collar added to the length of the guide rod.

To make eure whether the guide rods will, at all points, clear the inner edgee of the floate, produce A K to M, making K M equal K G, about M with a radius equal to a stem lever, draw a short circular arc cutting the circle B C—in L, then draw a paddle in the position corresponding to the position of L M of the stem lever; if the guide rod K M cleare the paddle in that position it will clear it in every other. When the feathering machinery is constructed according to these rules, the paddles, although they do not perform the rcquired motion with mathematical precision, approximate to it near enough for practical purposes throughout the arc E B D and for a short distance beyond it at hoth ends.

The greatest strees npon a stem lever and its guide rod occurs when the entering and leaving floats are about half immersed, as at D and E, in our diagram, and then according to the ordinary way of fitting up the mechanism there is thrust on the guide rods when the vessel ie driven ahead and tension when sbe is driven astern.

Mr. Scott Russel used to fix the stem levers on the fronts instead of the hacks of the floats and placed the center of the eccentric collar ahaft instead of afore that of the paddle wheel, so that there was tension on the guide rods when the ship was driven ahead and thrust when she was astern. The paddle wheels of the *Great Eastern* were so fitted, it was thought to he an arrangement more favorable to the etrength snd durahility of the rods than the ordinary arrangement.

Every paddle wheel, feathering or radial, ehould he properly halanced on its axis. It is had practice to fix counterpoises in the paddle wheel for the purpose of halancing the reaction of any part of the machinery on hoard. These produce great and irregular straine and endanger the eafety of the whole structure.

It was not my iutention when I began to prepare this lecture to devote so much time to the paddle wheel, and paddle wheel engines, and yet I have only succeeded in touching a few of the most prominent points of that branch of my euhject. My own conviction that this branch of marine engineering will have a future importance on this coast must he my excuse for setting you to thinking and I trust also to working on the subject. Advocating the adoption of swift paddle steamers for

Coast Passenger Work on this Coast,

Has been considered one of my weaknesses, hut now and again a new convert is made, and propositione that two or three yeare ago were laughed at are now considered, and compared with present plans.

I have here hefore you to-night a model for a vessel prepared hy me for the Southern trade of the Pacific Coast Steamship Co., and which they did me the honor to concider in all its hearings hefore ordering the *Queen of the Pacific*, now building for them.

This model was for a epeed of 18 miles per hour, wae to he of iron, 330 ft. long, 33 ft. beam and 20 ft. hold. By a peculiar section the sides were to sweep out in a curve to the guards, this would give great etahility in rough water and provide a great expanse of deck for passenger accommodation.

The engines were to be 3 cylinder oscillators ae already mentioned, of 2,500 horse-power, indicated. This vessel was to have a complete double hottom, the inner bottom being 3 6 from the onter, divided into four compartments; thie gave additional safety in case of touching ground.

But the principal object of this arrangement was to provide a means of keeping the vessel practicslly in the same trim for all oonditions of load. Thus the paddles would he desigued for the load line, that is with the water compartment all fnll, then as cargo was taken in, water would he pumpsd out, thus keeping the immersion of the paddles practically the same with all conditions of load.

Vessels of this clsss will be built yet for our coaet, and, in view of that fect, our time tonight has not been spent on an antiqnated type of the marine engine. The next time you and I meet we will have eomething to say about marine engines for screw propnlsion.

Notices of Recent Patents.

Among the patents recently obtained throngh Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

JOURNAL AND BOX.—Wm. H. Foye, San Francisco. No. 249,607. Dated Nov. 15, 1881. This invention relates to jonrnals and boxes for shafting and the framework therefor. The object is to secure a flexible frame and a line of flexible shafting witbout binding or in any way interfering with the rotation of the ehafting. It is specially adapted for use upon that class of agricultnral machinery which includes rotary or gang plows, pulverizere, harrows, and rotary cultivators of any description which require flexibility in order to conform to the irregularities of the ground over which they pass; but the fremework and ehafting are also for other uses and in other connections. The hearings for the shafts on the frame consist of spherical halls to receive the journals, these balls having a limited endwise motion in the bearings.

COMPOUND BARREL.—Hugo Mattullath, S. F. Dated Nov. 15, 1880. No. 249,650. Considerable difficulty is experienced in the construction of oasks for tbe transportation of oils or liquids of a penetrating nature, such as thoee derived from petroleum; and double wooden vessels either with or without an intervening filling have been employed, or wooden vessele having a close-fitting metallic lining variously oonstrncted; but all these are open to some objection. Mr. Mattullath'e invention relates to that class of compound barrele or packages in which an exterior case of wood is lined with metal. It consiste in certain details of constrnction of a combined wooden and sheet-metal cask. It is, in brief, a metallic cask having its end portions formed of sheets having tapering and gradually deepening corrugations from the edge to the chines or ends, combined with a central hand, to which the end portione are nuited, and hy whicb the length of the metallic cask is regulated and the whole strengthened.

HAY PRESS.—L. B. Lathrop, Hollister, Cal. Dated Nov. 15, 1881. No. 249,640. Thie ie a patent which covere certain detaile of construction, improving the press patented hy Mr. Lathrop on March 9, 1880. The prese ie a horizontal one, made of iron, and is designed to be permanently placed upon a four-wheeled wagon; and when in use, the wheels are locked, or the wagon is otherwise etaked to the ground, so that it is immovable. Mr. Lathrop doee good work with this press, and tbese new improvements make it still better. It would require elaborate engravings to ehow all the little points devised and carried out hy the inventor.

ADDING MACHINE.—P. C. Forreeter, S. F. Dated, Nov. 15, 1881. No. 249,606. This invention relatee to that class of adding machinee, the design of whiob is to record the sums of snccessive figures, by mechanical appliancee without any other mental operation than is necessary to work the machine. The principle of the invention is the operation of needles npon dials by means of a key hoard through intermediate mechanism, whereby the escapement governing the needles ie regulated to respond to the action of individual keys, denoting the nine digits. The mechanism of the devics ie very simple.

VEHICLE GEAR.—Geo. C. Buckland, Tulare, Cal. Dated, Nov. 15, 1881. No. 249,581. Mr. Buckland's invention on vehicle geare has for its object eimplicity and economy in conetrnction, together with durahility and effectiveness in nse. These improvements consist in a peculiar constrnction of the springs, and on the means of eecnring them to the axle and head block, the latter, of which, ie especially adapted to receive them; also in a croes hrace and a novel center spring riveted to said cross hrace, and extending forward under the axle and up on front, past hoth axle and head hlock, and hack upon itself, forming a spring loop throngh which the king holt passes.

THE Sutro tnnnel is gradually heing pnt in excellent repair. Old and shattered timhers have everywhere heen replaced hy new ones, and the sub-drain is kept in excellent order.

News in Brief.

A WILDCAT four and a half ft. long, and weighing 45 lbs., was killed near Lafayette, Contra Costa county, a few days ago.

AT a meeting of the directors of tbe Denver and New Orleans railroad the road was definitely located hy way of Pnehlo.

CINCINNATI finds great comfort in the helief that Vanderhilt and Gonld, working as rivals, are ahont to make that city a great railroad center.

THE total loss over the whole province of Ontario, Canada, by bush fires during the past season is estimated at hetween $10,000,000 and $15,000,000.

GRANT is said to bave made a round $500,000 out of his railroad connectione this year. Gossip always has a fondness for round numbers in theee matters.—*Philadelphia Press.*

THE *Whitehall Review* is reeponsible for the rumor that the Marqnis of Lorne and his illnstrious spouse may ultimately replace Earl Cowper and Conntese at Dnblin.

THE reports of Guiteau's trial excite tbe ntmoet astonishment among the English lawyers that such continued violations of decency are permitted in court.

THE San Jose Board of Education bas voted $500 for the pnrchase of type, cases and other printing apparatus, intending to have the art of printing taught in the public schools as a regular branch of education.

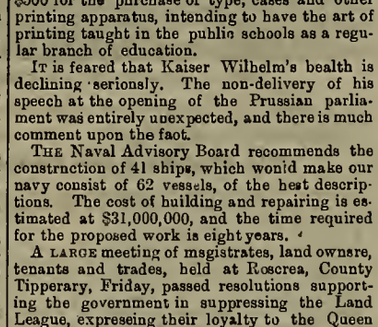
IT is feared that Kaiser Wilhelm's health is declining seriously. The non-delivery of his speech at the opening of the Prussian parliament was entirely nnexpected, and there is much comment upon the faot.

THE Naval Advisory Board recommends the constrnction of 41 ships, which wonld make our navy consist of 62 vessels, of the best descriptions. The cost of building and repairing is estimated at $31,000,000, and the time required for the proposed work is eight years.

A LARGE meeting of msgistrates, land owners, tenants and trades, held at Roscrea, County Tipperary, Friday, passed resolutions supporting the government in suppressing the Land League, expreseing their loyalty to the Queen and Constitution, and thanking the oonstahulary for their conduct in the late crisis.

Removal of Patent Agency and Newspaper Offices.

October 20th the patent agency and newspaper offices of Dewey & Co., were removed to the northeast corner of Front and Market Sts., occupying a large space on the upper floor, where we have spacious and pleasant rooms for the accomodation of our increasing business. Our apartments will have two entrances as shown in the following engraving: Our stairway, No. 252 Market St., and our elevator, No. 12 Front St.



☞ Take the Elevator at No. 12 Front St.

Visitors will find it better to step around the corner from Market St., to the elevator rather than ascend the stairs. Old and new friends are cordially invited to give us an early call in our new quarters.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omissiou of agents

BOOKSELLERS, STATIONERS, ETC.—Messrs. Payot, Upham & Co., No. 204 Sansome Street, are one of the oldest, most enterprising and reliable firms in the hook and station ery trade in San Francisco. Scientific, industrial and foreign publications are a specialty with them. They are also noted for their first quality of blank hook and fine station ery line of goods.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

ANNUAL STATISTICIAN of 1881.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 810 California st. Price, $4.

San Francisco Metal Market.

[WHOLESALE.
WEDNESDAY, November 16, 1881.

IRON.—			
American, Pig, soft, ton	—	@	30 00
Scotch, Pig, ton	26 50	@	27 50
American, White Pig, ton	—	@	—
Oregon Pig, ton	—	@	—
Clipper Gap, No. 1	—	@	26 00
Clipper Gap, White	—	@	30 00
Clipper Gap Car Wheel	—	@	33 00
Refined Bar	4	@	7½
Horse Shoes, keg	—	@	5 50
Nail Rod	—	@	7½
Norway, according to thickness	6½	@	7½
STEEL.—			
English Cast, lb	13	@	15
Black Diamond, ordinary sizes	—	@	15
Drill	15	@	16
Flat Bar	16	@	18
COPPER.—			
Ingot	—	@	22
Sheet	—	@	20
Sheating, Tinned 14x18	—	@	31
Nails	—	@	—
Bolts	—	@	33
Old	—	@	—
Bar	—	@	22
Cement, 100 fine	—	@	16½
LEAD.—			
Pig	—	@	5
Bar	—	@	6
Pipe	—	@	8
Sheet	—	@	9
Shot, discount 10% on 500 Bags			
Drop, per hag	—	@	2 10
Buck, "	—	@	2 30
Chilled "	—	@	2 50
TIN PLATES.—			
10x14 I C Charcoal	—	@	7 50
10x14 I C Coke	6 15	@	6 40
Banca Tin	—	@	27 50
Australian	—	@	23 50
I. C. Charcoal Roofing 14x20	—	@	5 90
ZINC.—			
By the Cask	—	@	9
Zinc, sheet 7x3 ft. 7 to 10 lb., less the cask	—	@	10
NAILS.—			
Assorted Sizes	4 00	@	4 15
QUICKSILVER.—			
By the flask	40	@	41
Flasks, new	—	@	1 35
Flasks, old	—	@	1 05

REMOVAL NOTICE.

The Sweepstake Plow Company's Works have been removed to

Benicia from San Leandro.

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Benicia, Solano County Cal.

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The "Explorers' and Assayers' Companion," of library or pocket size (3d edition), 488 pages, now ready, . . . 6 00

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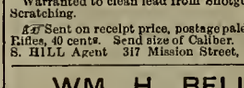
California Elastic Gun Wiper.



SUPERIOR TO ANY OTHER.

Warranted to clean lead from Shotguns or Rifles without Scratching.

☞ Sent on receipt price, postage paid; Shotguns, 50 cents. Rifles, 40 cents. Send size of Caliber. Trade Supplied B. S. HILL Agent 317 Mission Street, San Francisco, Cal.

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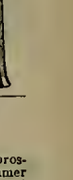

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NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the twenty-third day (23) of September, 1881, the several amounts set opposite the names of the respective stockholders as follows:

Names.	No. of Cert.	No. Shares	Amt.
C. C Marsh, Trustee.....	41	1000	$ 20 00
C. C. Marsh, Trustee.....	42	4000	80 00
C. C. Marsh, Trustee.....	44	300	6 00
A. B. Grogan, Trustee.....	45	12500 bal.	216 00
G. P. Thurston, Trustee.....	46	12500 bal.	230 00
G. P. Thurston, Trustee.....	48	10000	200 00
G. P. Thurston, Trustee.....	49	10000	200 00
G. P. Thurston, Trustee.....	50	5000	100 00
G. P. Thurston, Trustee.....	52	3500	70 00

And in accordance with law, and on an order of the Board of Directors, made on the second day (2) of November, 1881, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the Company, Room 33, No. 318 Pine Street, San Francisco, California, on Monday, the fifth day (5) of December, 1881, at the hour of four o'clock P. M., of said day, to pay said delinquent assessment thereon, together with the cost of advertising and expenses of sale.

F. G. MATHEWS, Sec'y.

Office, Room 33, No. 318 Pine St., San Francisco, Cal.

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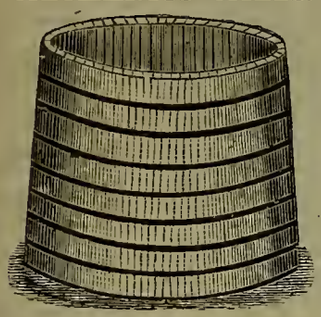

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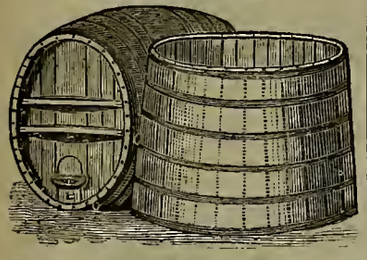

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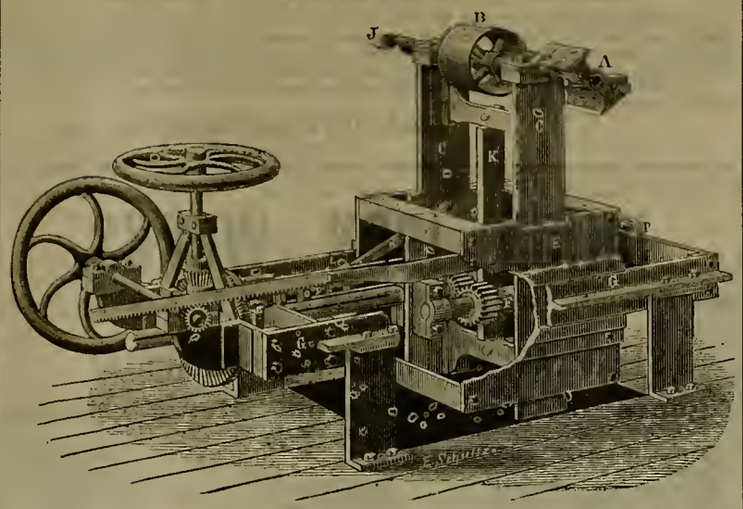

The above cut represents the Framing Machine invented by ISAAC LEPLEY, of Amador City, Cal. For perfection and rapidity of work it has no equal. Any form of cut, tenon, mortice, gain or dovetail in timber of any size can be made with exactness, and as rapidly as desired. It is complete in itself in all its parts, ready for the belt. The machine is simple in construction, and can be run by anyone of ordinary ability. Every mine requiring timber, and all mills where much framing is to be done, should have one, as a matter of economy. It will do the work of twenty men.

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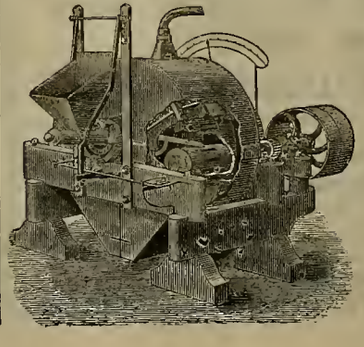

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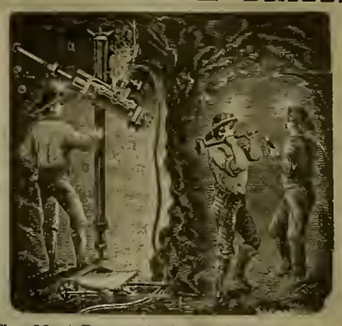

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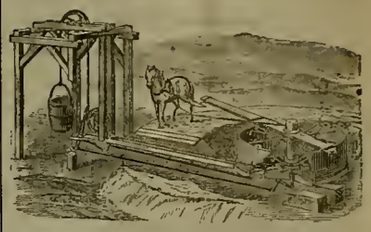

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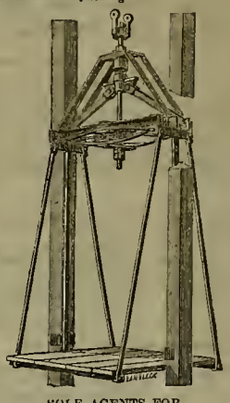

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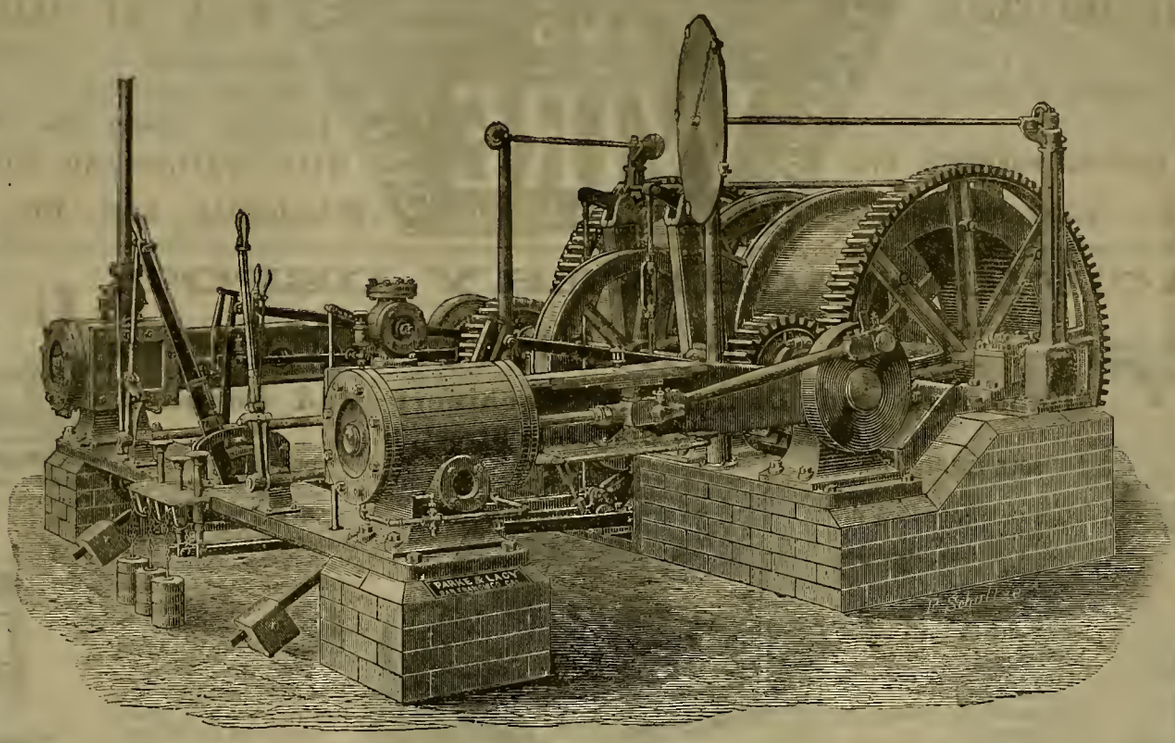

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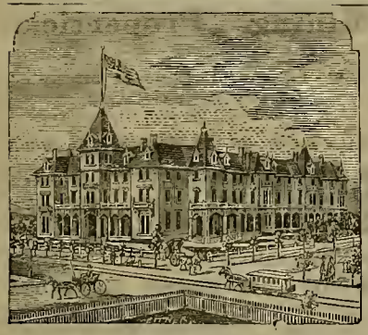

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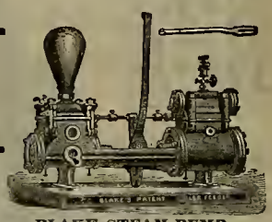

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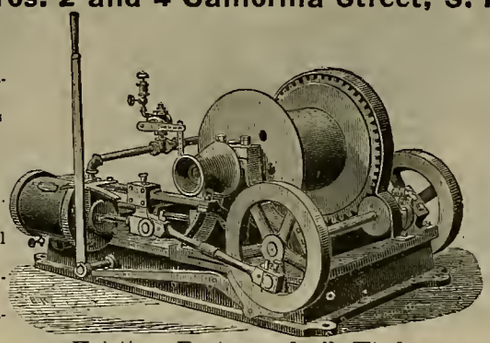

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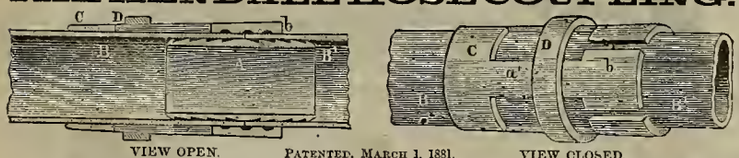

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SAN FRANCISCO, SATURDAY, DECEMBER 3, 1881.

VOLUME XLIII Number 23

Construction of Geological Cross Sections.

In the construction of underground curves, two methods are in general use:

1. By equal thickness.
2. By equal (parallel) dips.

The calculated thickness of each stratum is rigidly preserved throughout in the first method, by making the curvature in each seam concentric to those above it. These curves are usually compound curves composed of circular arcs.

When the second method is employed, no attempt is usually made to preserve uniformity of thickness along the axes of anticlinal or synclinal flexures, the opposing dips are prolonged until they intersect, and the curvature sketched in to suit the fancy of the draftsman; but a combination of this and the preceding method is sometimes employed.

The difference between these two methods is illustrated by Figs. 4 and 5, in which the surface observations are identical, but the underground (hypothecated) curves vary widely. In Fig. 4 each stratum preserves a uniform thickness throughout, but in Fig. 5 the prolongation of the opposing dips produces an augmented thickness along the synclinal and anticlinal axes.

As it is evident that the first method will show the minimum depth of any coal in the basin, and the second the probable maximum depth—in all but exceptional instances—a combination of these two methods is apparently preferable, as more nearly approximating the probable underground curvatures. Such a combination has been employed by some members of the Geological Survey in the construction of many of the sections in Pennsylvania.

But there is a serious objection to any system, involving in whole or in part the method of equal thicknessess, viz., *the gradual obliteration of the surface flexures in the underlying rocks.*

This is illustrated by Fig. 6, which is constructed partly on this system. It will be observed that the steepest dips are *along the line of observed exposures;* above and beneath this line the axes rapidly fade away, and can hardly be seen in the basal stratum. The same result obtains in the (restored) formations lying above the present surface.

Sections constructed on this principle (Figs. 4 and 6) will, therefore, always show the maximum curvatures along the line of observed dips. It is hardly necessary to say that any method uniformly giving these results must be essentially false. The apparent regularity of profiles so constructed lends false pretensions of accuracy to the section.

Under *one sequence of conditions only* does this method give results approximating the true underground structure. Having reference to Fig. 6, let us suppose the lower strata to consist of hard, massive sandstones, or conglomerates, and the upper rocks of soft slates or shales. If a lateral compressing (flexing) force acts upon this series, the lower massive formation will yield in curves of large radius, while the overlying softer strata compressed in the trough thus formed will be thrown into a series of crimplee resulting in flexures similar to those shown in the section.

If, on the contrary, the observed dips in the upper rocks are in hard strata underlaid by softer rocks, these latter would suffer the greatest contortion, whereas the construction shows them nearly flat.

I have lately made a series of experiments on rock contortion, by artificially compressing layers of clay, paper, India rubber, wax, etc., and have attempted to deduce laws governing the relationships of the resulting curves, which might be practically applied to geological sectioning; but the factors involved are so numerous and vary between such wide limits, that it seems an almost hopeless task. I have, however, arrived at some general conclusions that may be of service.

1. The subordinate flexures of the sub-basins in a synclinal of soft rocks underlaid by a hard resisting formation, decrease in sharpness towards this basal rock.

2. If a series of soft measures underlies the hard formation, it may be contorted by a series of flexures bearing no relation to the upper series.

3. Where large masses of approximately uniform hardness are contorted by compression, the resulting curves bear close complementary relations to each other. (See Fig. 5)

The first of the above propositions has already been referred to on a preceding page. When these conditions obtain, as in the anthracite coal basins, the coal-measure rocks are crimpled and distorted while their hard basal plate of conglomerate has been arched into curves of large radius, with flat dips, as proved by diamond drill-holes. When these conditions obtain, the method of equal thicknesses, or a modification of that method (Figs. 4 and 6), will give curves more nearly approximating the underground structure than any other method.

Fig.4.

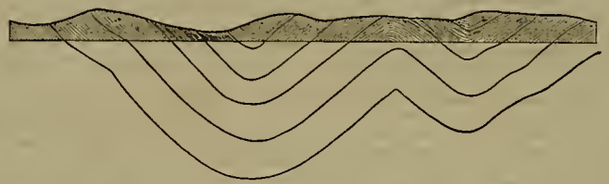


Fig.5.

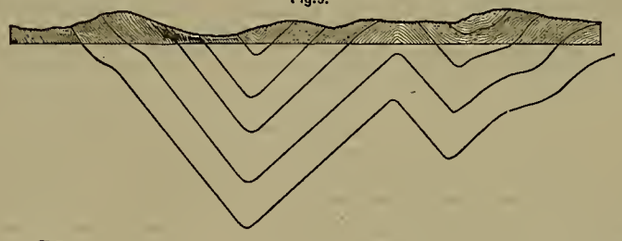
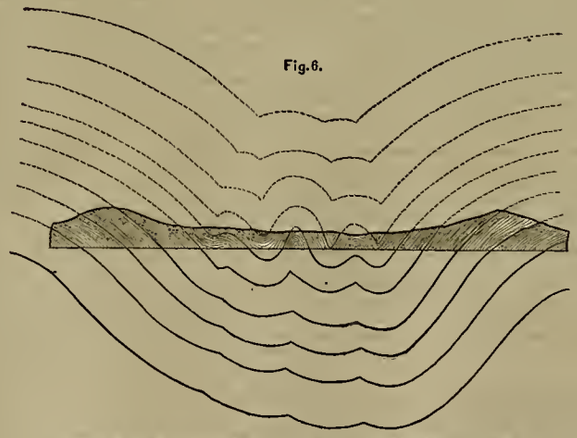


Fig.6.



PROFILES OF GEOLOGICAL CROSS SECTIONS.

On the Lehigh river we find a striking exemplification of the second proposition. At Slatington the lower Silurian (roofing) slates, No. III, are twisted and contorted by a complex series of overturned flexures. Above these come the hard sandstones and conglomerates, No. IV, forming the mountain, dipping down in gentle curves of larger radius beneath the softer upper Silurian strata of Hazardville and Bowmansville. These latter are twisted, faulted, and overturned, but these flexures can have no possible relation to those in the roofing slates, lying 5,000 ft. beneath, and separated from them by the hard rocks of No. IV, which reflect the minor flexures of neither the former nor the latter. Under conditions similar to these it is of course utterly impossible to indicate the curves of the lower formation from any data obtained from the upper rocks.

The conditions of the third proposition are strikingly shown by cross-sections of the coal measures in some parts of France, in which the various coal seams are bent in a series of parallel zig-zag lines. Here the second method, *i. e.* by equal dips, is peculiarly applicable.

When the observed dips are in a hard, massive formation underlaid by softer rocks, and underground curves are always indeterminable.

Too much reliance is often placed upon geological cross sections as a means of determining underground structure. In this their utility is limited, but as a means of estimating rock thickness, as a help to intelligent prospecting, and as a pictorial means of representing demonstrated and hypothecated structure, their value is great.

A CORRESPONDENT of the PRESS writing from Plano, Tulare county, says: I might call attention to the fact that there is an excellent and inexhaustible supply of granite on a spur of the foothills close by to this place, some 30 miles southeast of Visalia, and that a few miles further there is some excellent marble. Also, there is a hill with good magnesite ore rich in iron, none of which are worked.

AS TO the power and rights the miners have derived from the Government, the Amador *Sentinel* can see little room for argument. When the mining land was sold no reservation was made. It was well known that the water used in mining must find its way into the streams again, and that a certain proportion of the earthy substance would accompany it. For 30 years this mining has been going on, and no attempt of a serious nature has been made to interfere with it until the present year.

ALL the miners believe that the right to mine was conferred by the general Government, and unless reparation be made the miner, a State court cannot take from him his occupation and render his property valueless.

Blasting in Collieries.

It seems somewhat strange that after seeing the remarkable difference in product arising from the use of powder in mines, that the possibility of doing without it should ever be considered. Yet for many months the subject has been discussed in Great Britain. The government considers it a necessary step, in order to preserve human life, to insist that no one shall be in the mine when shots are fired. It seems the matter cannot be left to mine owners to decide, whether the mine is dangerous or not. Some persons advocate prohibiting entirely the use of powder in coal mines.

A meeting of the members of the Mining Association of Great Britain was held recently at the Westminster Palace hotel for the purpose of considering a circular issued from the Home Office, through Mr. J. Dickinson, the inspector of mines, to the proprietors of mines. The circular in question drew attention to the opinion expressed by the law officers of the Crown as to the interpretation of Sec. 51 of the Coal Mines Regulation Act, 1872, making it obligatory on persons ordinarily employed in the mine to be out of the mine when gunpowder was used for blasting purposes; and requested that the requirements of the act should in future be strictly carried out where heretofore they had not been observed. Mr. Alfred Barnes, M.P., the president of the association, occupied the chair, and there was a numerous attendance of delegates from all parts of the country. After a long discussion, the matter was eventually referred to a representative committee to be considered and reported upon.

Nearly 50,000 miners and others employed in collieries of South Wales and Monmouthshire were represented at a delegate conference held at Aberdare a few weeks since, when the Home Office circular as to shot firing in mines was considered. After a prolonged discussion, a resolution was passed expressing the opinion that, considering the hard nature of some of the seams being worked, and the almost insurmountable difficulties of the ripping of top and the cutting of bottom without the aid of explosives, to work a number of seams in the South Wales coalfield without blasting would be impracticable, and that with care and competency the present regulations for the use of gunpowder are sufficient. It was subsequently resolved to send copies of the resolution to the mine inspectors, and others. A deputation of the delegates waited by appointment upon Lord Aberdare to lay before him their reasons against the recently issued government prohibition of powder blasting in collieries, except when the colliery are all out of the working. His lordship, when Home Secretary, had charge of the Mines act, the Home Office construction of a section of which act is now the subject matter of dispute. His lordship acquiesced in the general tenor of the views of the deputation, and it was arranged to have a representation made upon the matter to Sir Wm. Harcourt.

So far as hydraulic mines not being run for the special benefit of the laborers, it may be said that the same will apply to farming, manufacturing, or any other occupation. They are carried on more particularly with a view to benefit the owners. In mining, white men receive from $2.50 to $3 per day, which is far above the rate that is paid for farming or manufacturing labor. The working miners complain of the injunctions, because they are kept from pursuing their occupations for an indefinite length of time, and are prevented from gaining a livelihood. They do not complain of the wages paid them when they can work, and are then as prosperous as any working men in the State.

CALVIN PELCIVAL died at Washington, Nevada Co. on Nov. 15th. Mr. Percival was a miner of extensive experience, having visited the mines of Australia, Montana and many other parts of the world, in addition to California. He made money rapidly and was once very rich, but, like the majority of old timers, he spent the greater part of it in prospecting.

California Water Rights.

A decision was rendered Nov. 3d, by Judge Brundage of the Superior Court of Kern county, in the great water suit of Miller & Lux et als. vs. the Calloway Canal Co., in favor of the defendants. In its relation to the agricultural interests of the southern part of the State, the case is of supreme importance. The plaintiffs are the owners of certain swamp lands lying between Buena Vista and Tulare lakes; Kern river is an effluent of Buena Vista lake. In times of high water, this lake sometimes overflows these lands or fills some ill-defined channels that meander through them. Upon this circumstance they claimed the waters of Kern river as riparian owners, and brought an action for an injunction to prevent the diversion of water through the Calloway canal. The defendants claimed the water as prior appropriators to irrigate public lands along said canal. Similar suits were commenced against all the other irrigating companies diverting water from Kern river. Had the plaintiffs been successful, the irrigating system of Kern valley would have been at their mercy, as they would virtually have owned the waters of the river.

The decision of Judge Brundage has apparently been prepared with great care, and after long study of the subject and search for authorities. It involves the vital point of riparian ownership in water, as defined by the present English law against the prior appropriation rights, which were recognized in the older English law, and are in force in all countries where irrigation is practised. The decision of Judge Brundage is published in full, in a supplement to the *Kern County Californian*, of Bakersfield, where all who desire the opinion in extenso may obtain it. It will serve the purpose of the majority of our readers to have the leading points involved and the decision thereupon, and these we present in the form of an abstract of the decision, made by the Bakersfield *Record*, as follows:

The plaintiffs claiming as riparian owners, contend that the common law of England is in force in this State, and that by its provisions, a riparian owner of a stream not navigable takes the land to the center of the stream, and that the right of the use of the water flowing over the land is an incident to his estate, and he has a right to have the water flow, as it was wont naturally to flow, without diminution or alteration. The claim for damages was abandoned, and the suit is now one in equity for an injunction alone.

The defendant claims that plaintiffs are not riparian owners, and even if they were, the doctrine of riparian rights for which plaintiffs contend, has no application to California on account of the physical condition—that the law in this case is the law of appropriation to beneficial uses, and not the modern English doctrine of riparian law.

The Court says: "The plaintiff's lands consist of two parcels lying in Buena Vista swamp: one parcel, lying near Tulare lake, some 50 miles below the head of the Calloway canal, through which the defendant directed the water of Kern river, and the other parcel, higher up in the swamp, about 20 miles below the head of the Calloway.

"The defendant claims the right to divert the water for irrigating public lands along the Calloway canal, as a prior appropriation, having made the appropriation before the plaintiffs acquired title to their lands.

"The plaintiffs derived their titles to their lands as swamp and overflowed land from the State of California, under the reclamation law of the State by patents bearing date subsequent to the appropriation for the Calloway canal."

One of the principal points in the decision is that "riparian rights are subordinate to rights of appropriation," and in support of his views on this subject, the Court quotes numerous authorities to show where the rights of appropriation have attained a precedence over the riparian law. He holds that the common law of England, adopted by the Legislature of California in April, 1850, was adopted only so far as it conformed and was consistent with our institutions and forms of government, and was applicable to our conditions. The Court says:

"The doctrine of riparian law, which had been found applicable and suitable in England, and possibly to the abundantly watered States east of the Rocky mountains, if enforced in the State of California would condemn to perpetual barrenness nearly the whole of the great interior valleys.

"The courts of New York had decided that although the Legislature of that State had adopted the common law of England, and that law declared that no stream was navigable beyond the ebb and flow of the tide, did not apply to this country, where the physical conditions are different—that it could have no application to a continent full of great navigable rivers and fresh water lakes, where the tide does not ebb and flow, but which are really navigable waters."

The court holds that the law of appropriation is strengthened by custom and the acquiescence of both the State and Federal governments, the same foundation upon which rests the whole superstructure of the common law of England. "'The common law of England,' says Blackstone, 'is a law built up from custom, and it is one of the characteristic marks of English liberty that the common law depends upon custom, which carries internal evidence of freedom along with it, that it was probably introduced by the voluntary consent of the people.'"

"It is generally held throughout the Pacific States and Territories, that the right to water by prior appropriation for any beneficial purpose, is entitled to protection. * * If the water had been diverted before plaintiffs bought their land, they purchased it with a knowledge of the policy of the government and the grant gave them no rights to the water. If, when they purchased the land, the water was still flowing in the stream and unappropriated, and they needed it for their farm, they had nothing to do but appropriate it and apply it to their own uses."

"Even upon the strict doctrine of riparian rights, as declared in the decisions of States where irrigation is not a necessity, the defendant is entitled to the same privilege with reference to the water of Kern river as a 'supra' riparian proprietor. This gives it the right to make a reasonable use of the waters to supply all natural wants, of which, upon these desert lands, irrigation is one, and the defendant's appropriation of the water here does not exceed such reasonable use. * * The defendants might, if necessary, have taken for this and other natural wants all the water in the river, but the proof here is that only a reasonable portion of it, in fact, was taken."

"I am inclined to the opinion, from the hurried review that I have been able to make of the apparently conflicting authorities on the subject, that the true rule in a case of this kind is that a court of equity will not take jurisdiction on a bill for an injunction when the title is disputed, without first requiring the complaining party to establish his title of law, and this the plaintiffs have not done.

"I am also of the opinion that the plaintiffs, although the full period of the statute of limitations has not run, have been guilty of such laches that a court of equity ought not to entertain a bill for an injunction. Some of the titles under which the plaintiffs claim and on which they rely, were obtained January, 1876, and the others at different times down to August, 1878. If these plaintiffs had any right of action at the time they commenced this suit, they had an equally valid one more than three years before. They stood by and saw the defendant expending vast sums of money in constructing its irrigating canal without objection or protest—without seeking in any manner the interposition of a court of equity, and it does not seem equitable to give the extraordinary remedy of an injunction which will necessarily render valueless this expenditure, destroy the canal and condemn the whole country along its course, now converted by the money and enterprise of the defendant from a desert into a garden. This view seems to be abundantly supported by authority.

The Car Shops of West Oakland.—The work on the Central Pacific car shops in the new yards is fairly under way. The foundations on the east side are all laid and squared on the top, the south wall of the west wing up eight or ten feet, the corners laid, and this morning the bricklayers commenced work on the north wall. The building is 153 ft. front and 80 ft. deep in the main structure with a west extention of 80 ft. more, making the center portion nearly 160 ft. square. There are 15 men employed, and over 400,000 bricks will be used. The work is all first-class, and is under the supervision of Mr. Geo. Nagle, the contractor. In front of the building is to be placed a transfer table, upon which cars can be moved to any of the entrances of the main building, which is to be fitted with tracks throughout. At the southwest corner of the building is to be erected a brick engine house, 56x22, in which there will be a stationary engine to run the lathes and other machinery in the shops. The new round-house, which will be erected south and west of this building, will be commenced after the bricklayers are through with the present work. The building will be complete in every respect, and a great improvment on those now in use. The building at the foot of Wood street is ready for the roofers.—*Oakland Tribune.*

The hydraulic pumps at the Chollar-Norcross-Savage shaft, which was described and illustrated in a recent number of the Mining and Scientific Press, will soon be made to run by a natural flow of water led to the feed pipe from the works of the Virginia & Gold Hill Water Co. When this change has been made there will be no need of the present surface apparatus by means of which a pressure is brought to bear on the water in the feed pipe, and a return column for the replenishment of the feed pipe brought to the surface. The flow of water down the feed pipe will run the pumping apparatus at the 2400 level, and all the water will pass out at the Sutro tunnel level.

Chas. Jones, one of the two miners who discovered the famous group of Robineon mines, in Colorado, died while drunk in a Leadville saloon. He then owned a quarter interest in seven mines out of the 12 constituting the Robineon consolidation, from which the late Lieutenant Governor Robineon made his fortune of over $1,000,000. The heirs of Jones live in Vermont, and not being informed of the great value of his estate, were induced to accept $1,200 for an estate really worth $250,000. A legal contest is to follow.

The mining situation on the Forest Hill and Iowa Hill divides, Placer county, is very satisfactory.

The Sebillot Process.

Sulphuric Acid and Ores.

It is a long-established fact in chemistry that heated sulphuric acid will completely disintegrate ores. That agent is used by the United States assay offices for the purposes of assaying, and it is quite generally acknowledged to be the most effective disintegrator known to chemistry. Its application in the treatment of ores on a large working scale has, however, thus far been impossible; for no means has been applied for conserving the evaporated acids, and its heavy cost would preclude its use even at those points where it is cheapest, and much more in the larger mining States, where it sells at over $100 per ton. These obstacles to its use appear to have been effectually surmounted by M. Sebillot, an eminent Paris engineer, through patented contrivances by which he condenses so much of the acid as evaporates and reproduces such portions of it as go into combination with the ore in course of treatment, both the condensation and the reconstruction being, it is claimed, effected at a comparatively nominal cost.

The complete reduction of the ore is effected through mixing it, in a pulverized condition, with from one to one and a half times its weight of strong sulphuric acid, and subjecting it to a moderate heat until the acid is entirely evaporated. The reduced mass is then subjected to processes regularly practiced in metallurgy, and the entire contents of precious and base metals are obtained in a pure condition, the iron being available for the manufacture of steel without further change. As already stated, the acid that has been used in the conversion of the ore is saved or re-made, with but a trifling loss, and is available for repetitions of use without limit.

The inventor claims that the cost per ton of this procuring all the metals, precious and base, each in a chemically pure condition, is far less than that of procuring the gold and silver alone under the best and most carefully operated processes at present known; and, considering the nature and economics of the process and its exemption from destructive temperatures or expensive agents, there seems to be good *prima facie* evidence that this claim may be well founded. The process professes to be equally adapted to all kinds of ores. For sulphurets it should possess a special adaptation, inasmuch as it conserves the sulphur and includes an apparatus for converting it into sulphuric acid at a small part of the cost common in the leading acid works of our manufacturing cities. In some parts of the country this would be a most important advantage; as, for instance, in North Carolina, where the sulphur could be extracted from now worthless pyrites and made into sulphuric acid for the manufacture of phosphate manures, the residuum of the ore being treated for its base metals and such gold or silver as it might contain. When it is considered that large masses of those now useless ores contain in each ton about 950 lbs. of sulphur, and 950 lbs. of iron, and from $2 to $12 in gold, the profit that would accrue from such treatment becomes apparent. It is computed that Colorado ores contain, on an average, about 250 lbs. of iron per ton, 200 lbs. of zinc, 80 lbs of copper, and 300 lbs. of sulphur; which, being claimed to be recoverable under this process, would give it a most important advantage over the best existing methods.

Miners will perceive at a glance that, if this process can be successfully applied, a great revolution in mining must result. A method that gives the assay contents of procuring 60% to 95% of those metals, and that gives in addition all other minerals in the ore that have any value, would confer a largely increased value upon all ores and make profitable a vast extent of mining that can now be conducted only at a loss. It would not only increase the value of mining property, but would revive mines that have been abandoned because of the low grade or the refractory nature of their ores. Vast quantities of stubborn ores in Colorado that, while assaying $40 to $75 per ton of gold and silver, are worthless because no process can reduce them at a profit, would then yield a good return to the miner. Indeed, it is not easy to put a limit to the extension of mining that must follow the successful application of such a process. However, forecastings may be very properly deferred until the Sebillot method has had a fair trial, which it appears likely to have at an early day. A company has been formed for working the process, and preliminary works have been started at Denver for perfecting the working details, preparatory to the erection of works on a large scale.

So long as we are accustomed to announcement of "improvements" in reduction which turn out to be failures, it is proper to regard all new processes as on probation until their merits have been demonstrated by working results. It is only just, however, to M. Sebillot's method to acknowledge that it carries on its face more probability of success than new processes generally do. It comes from an engineer of acknowledged ability and character in his profession. It attempts nothing new in chemical processes. Indeed, beyond the condensation of the acid vapor and the reconstitution of acid destroyed—which from expert evidence appear to be accomplished with success—the process includes nothing that is not commonly done in industrial operations. What is new seems to be the simplest part of the process, and what is old has been put beyond doubt by experience. This much must, in justice, be conceded in advance of trial; for the rest we must wait for the verdict of results, though from what we know of the process, we incline to an anticipation that the results will largely justify the inventor's claims.—*N. Y. Commercial Bulletin.*

Brief Mining Notes.

Hon. Robt. Ingersoll, of lecture fame, is interested in mines near Chloride, N. M.

The Copper Queen mine, Arizona, ships 300 tons of copper per month.

A rich strike is reported at the Burning Moscow mine, San Buenaventura.

If Eureka does not have a mining boom next spring, then all the signs will fail.

The Prospect Mountain tunnel, Eureka, has now been run a distance of 1,775 ft. When completed it will be 3,000 ft. long.

The Eureka mill, one of the largest and most complete in Nevada, has been "hung up" for a long time.

D. B. Lyman, Supt. of the Pacific M & M Co., has been appointed superintendent of the Utah mine, vice Rooney, who declined to accept.

The bins at the Richmond company's works are overflowing with charcoal, and there are some 40,000 bushels piled up in sacks besides.

Reduction works are a necessity in Tucson. Capital is abundant, and will not hesitate to come, if prospectors and interested parties will direct their attention to demonstrating the existence of large deposits of low-grade lead ores.

A correspondent writing from Poormen's district says: While we blast and pick and shovel the ore into the bucket, as it comes sliding down the incline, we forget about bacon and frijoles, and overalls and rough blankets, other petty discomforts, and talk about Europe and World's Fairs as familiarly as though they were things of the present; and although we do not build castles in the air, we lay plans for a good many under ground.

Daniel Collins, who lived in Humbug Canyon, about three miles below Damascus, for the last 25 or 30 years, one of the oldest residents of that locality, was found dead in his cabin last Monday. His body was so badly mashed that his bowels protruded, which led to the conclusion that he must have been caved on in his mine, and extricating himself had crawled in his cabin, some 2,000 ft., in his badly crippled condition, and there lying down in an exhausted state, died.

The Antelope mill at Del Monte station, recently bought by Gov. Blaisdell, is a very handsome brick structure, with a battery of 20 stamps, the boiler and engine and all the machinery complete. It was erected during the mining excitement in Aurora several years ago, at a cost of over $200,000, and was run but a short time. The Governor now has a force of men at work putting in new foundations and arranging everything for an extended run. He purposes working ore from his West Humboldt mine.

The miners paid the Government for their lands, just as the agriculturists did, the only difference being that the miners paid $250 per acre as against $1.25 by the ranchers. The miners also were the first to occupy the public domain. In the early days everybody came to California to mine for gold. Few, if any, came to till the soil. It seems harsh in the extreme that the men and industry which peopled those golden shores and gave birth to a sovereign State, should be forced to take back seats in the end.

Gold and Silver in Norway and Sweden.—Two Englishmen, Mr. W. Gray and Captain M. R. M. Griffith, R.N., have recently obtained a concession from the Norwegian Government to search for alluvial gold in the rivers of Finmarken, in the north of Norway. Every year several parties of Norwegians have been engaged in washing gold in these rivers, close to the Russian frontier, the only condition which the Government imposes being that the quantity of gold extracted is duly reported. The profits, however, of these enterprises have hitherto been very small; in fact, only just paying for labor. Silver lodes of more than ordinary richness have also been discovered in the north of Norway, and offered to the Norwegian public, and it is said that the formation of a company is contemplated with a view to work these lodes. When it is considered that the silver-works of Kongsberg, now belonging to the Crown, were for more than 200 years worked with a very small surplus, and that the cost of producing an ounce of silver at the Tinoren Silver works was equivalent to spending such a quantity in gold, we cannot be surprised that the concern is not received with very great enthusiasm in Scandinavia. The prospect of interesting Englishmen in the alluvial gold deposits in Finmarken has therefore met with much favor, the Norwegians being evidently of opinion that our capitalists have more money to expend on such operations than their own. In this connection it may be mentioned that gold has also been lately found in not inconsiderable quantities in the copper mine of Falu. In some instances the lumps brought up with the quartz in which it is imbedded have been, it is said, about the size of peas. The discovery is, however, not considered of any financial importance, but looked upon merely as a geological curiosity.—*Iron.*

MECHANICAL PROGRESS.

Erroneous Ideas of the Steam Engine.

Every first-class mechanical engineer can remember the time when the commonest terms in use about steam and its mechanical employment were unknown Greek and Latin to him; so no excuse is necessary for the following answers to questions by young mechanics that have been preferred more than once. In theory and in principle there is no machine in use that is less complex and more readily understood than the steam engine. Its principle is founded on the plainest abstract rules and the most obvious practical experiments in natural philosophy, but in practice the numerous transformations of the steam engine, and the apparent intricacy of its mechanism appal the earnest inquirer who imagines that the text books do not give him half the facts, and that engine builders withhold mysterious truths which none but the initiated can understand. This is not so, but more befogging about the steam engine has come from the misuse of terms than from the withholding of facts.

The two Systems of Steam Engines.

There are two general systems of using steam in engines that give two divisions of steam engines known, in common parlance, as "high pressure engines" and "low pressure engines." These terms are, however, not only indefinite, but calculated to convey a wrong idea. To the impractical inquirer the term "high pressure," as contradistinguished from "low pressure" implies the use of steam at a much greater energy to the square inch than "low pressure," and suggests possibly greater danger from explosions. But the fact is that there are "low pressure" and "high pressure" boilers which carry steam of the same general pressure. A "high pressure" boiler is not, necessarily, a dangerous one, neither is a "low pressure" boiler necessarily safe.

The proper distinguishing terms are "non-condensing" and "condensing" engines, the "non-condensing" corresponding to "high pressure" and the "condensing" to "low pressure."

When the steam used in the engine cylinder has performed its work of driving the piston from one end of the cylinder to the other it is allowed to escape either into the atmosphere or into an exhausted receiver known as the "condenser." The "non-condensing," or misnamed "high-pressure" engine exhausts its steam directly into the atmosphere, striking against it with such force as to produce a noisy concussion heard at every stroke of the piston, and particularly noticeable on locomotives on starting and while getting under way. The extent of this force can be readily understood when it is remembered that the atmosphere presents an obstacle against the steam of a weight of 15 lbs.—or nearly—for every square inch of area. It is evident, then, that the productive power and useful energy of the "non-condensing" engine is short of just that amount of effectiveness—in other words, that the energy necessary to displace the atmosphere and remove its pressure by the escaping steam is not used in the propulsion of the engine and its load.

Comparative Value of the Two Systems.

At first sight it would appear to be demonstrated that the "non-condensing" engine would, of course, be more expensive in use than one that did not have this drawback; but this is not necessarily so, for some other elements than those of the first cost of steam and its direct effectiveness are concerned in the problem of how to produce and use steam power economically. If this were not so there would be comparatively small advantage in the variety of styles of steam engines; and yet it is apparent to the most cursory observation that steam engines must be designed for their special place and work as much as road vehicles should be—the coach, omnibus, and truck team having only the most general characteristics in common with the buggy, racing gig and bicycle.

The "condensing" engine, on the contrary, exhausts its steam into a vacuum—as nearly a vacuum as may be produced by mechanical means—formed by exhausting the air from a vessel called the "condenser." When the exhaust steam from the engine has done its work of pushing the piston in one direction it passes instantly into this vacuum, where it is met by a jet of cold water, instantly condensing the steam, thus reducing its volume from about 1,700 to 1, the proportion between water in a vaporous or gaseous state and water in a solid condition. At the same time the latent heat in the steam leaves the water at a proper heat to be fed back to the boiler, the temperature being from 100° to 120°.

But the addition of the condenser, the necessary air pump and appurtenances make the condensing engine more complicated and cumbersome than a non-condensing engine, and somewhat limits its use, and greatly adds to its first cost. These facts have restricted the general use of the condensing engine, and almost confined its employment to the propelling of large steamships and the driving of machinery in extensive manufactories. There is

Another Popular Error

Relating to steam engines, and their work, and that is the common style of talking "horse power" in allusion to the power value of steam engines. This method of defining the energy of steam was originated by James Watt, who had no other handy and available comparison than the work done by Cornish horses in raising coal, men and water by means of winch and pump from the depths of coal mines. As his engine was primarily constructed to supersede, or to compete with the work of horses it was but natural that Mr. Watt should place their animal power in contrast, or comparison, with his atmospheric engine; and having ascertained that the best of the trained hoisting horses could raise 33,000 lbs. one foot in one minute over a single pulley, he adopted that as his initial or rudiment of power-measuring. From Mr. Watt and his works at Soho the "horse power" went out as the unit of steam power.

But modern engineers, although employing this term, do so with mental reservation, or at least mentally define it in the consideration of: Pressure per square inch. Area of piston in square inches. Velocity of piston. If nearer approximation is desired, other considerations are taken into the problem, as the point of cut-off of the admission of steam to the cylinder, the character of the valve gear, the amount of clearance, the diameter and weight of the flywheel, and other items relating to the normal condition and useful quality of the steam. For general and rough estimates, however, the practical engineer conveys to a brother engineer an idea of the power of an engine by stating the boiler pressure, diameter of piston and length of stroke.

How the "Indicator" is Used.

When approximate and nearly absolute results in the knowledge of steam use are desired, the "indicator" is attached to the steam engine cylinder. This is a small steam cylinder that takes the steam at the same instant the engine piston takes it, and, of course, with the same pressure; and while the engine piston is doing its work, the minister's piston is recording it, by means of attached mechanism on a sheet of paper. By having one of these indicators at each end of an engine cylinder, the reciprocating action of the steam in the cylinder is simultaneously recorded in the form of a diagram that, by right lines and curves, gives the data of the admission of steam, the point of its shutting off, the amount of its expansive energy, and the total of its work. Very accurate measurations have been made by this miniature instrument, but the diameter of the cylinder has an area of only about one inch, while that of the measured cylinder may vary from 6 or 10 square inches to as many square ft. By the use of this instrument, the determination between "nominal" (calculated) and "indicated" (real) horse power is found, the variations of which are very marked.—*Boston Jour. of Com.*

The Cost of Iron Castings.

When an individual, a firm or a company runs an iron foundry without a machine shop, or a boiler shop, or any other like attachment, it is very easy to determine just what it costs per pound to make iron castings. Again, when the proprietor of a shop buys all his castings, he knows to a certainty what they cost. But when an establishment consists of a foundry, a machine shop, and perhaps two or three other departments, the probabilities are that no accurate account will be kept of the actual cost of iron castings. The proprietor must of necessity know what are the net results of his work, but where a mixed business is carried on, there is no way to know exactly what castings cost, or what machine work costs, unless a separate record of every element of expenditure is kept for each department. A large portion of the shop owners are satisfied if the establishment is making money upon its aggregate business, without bothering themselves about probable elements of loss.

Relative economies are overlooked when a fair exhibition of general economy is apparent. Thus, it often happens that concerns making their own iron castings pay more per pound for what they use, all elements being considered, than the same could be procured for on contract with some neighboring foundry. Tell them that this is the case, and they will not believe it. Sometimes a shop of this kind takes an order for a lot of castings for outside parties at what is considered a fair price, and makes the unpleasant discovery when the order is executed that there is no profit, but on the contrary a loss in the transaction.

The effect of such an event upon the business habits of the proprietor is apt to be salutary.

It is often decidedly cheaper to buy castings, even in large quantities, than to conduct a foundry and make them.—*American Machinist.*

SHARPENING CIRCULAR SAWS.—The following method is recommended for sharpening a circular saw which has become blunted. The saw being set in motion, a fine cut file is held against the teeth until all are equably leveled. A pointed tool, or steel pen, dipped in ink, is then applied to the saw as it revolves, a little below the depth of the teeth, making a circle on the saw plate. The saw is then taken from the spindle and either remounted or screwed into a bench-vice between two washers of wood, which should reach within half an inch of the teeth. The teeth are then carefully filed to the line drawn with the tool or pen.

TO WIND a watch it is better to turn the hole downward, and let the small end of the key point upward. This will allow any little particles of dirt, metal or dust to drop out, and the watch will not need cleaning so often.

SCIENTIFIC PROGRESS.

The Prince of Planets.

We are indebted to the Providence *Journal* for the following description of Jupiter, which planet now nightly shines with unwonted brilliancy in close proximity to the glittering Pleiades: "This lordly leader of the starry throng now dominates the sky, and his four moons are plainly visible through a good field-glass. The dry climate and clear atmosphere of Arizona are peculiarly favorable to the observation of celestial phenomena, and if one of the observatories now located near the humid sea-shore, or in close proximity to smoking cities, were removed to one of our mountain peaks, the best results in astronomical discovery might be expected. Jupiter is morning star till the 13th of November, when, passing to the eastern side of the sun, he becomes evening star. If Mercury deserves the palm on the planetary annals of November as the hero of the transit, Jupiter will win equal renown for the most brilliant speech in his course, his opposition with the sun. This grand event occurs at four o'clock on the morning of November 13th, when Jupiter will be nearer to us than he will again before more than a year to come. He will then rise at sunset, being opposite the sun, and no one who looks at the eastern sky, almost as soon as the sun has disappeared below the western horizon, can fail to recognize the prince of planets as with majestic steps he treads his sparkling pathway toward the zenith. In brilliancy and size he exceeds every star then visible in the heavens, and wins from every star-gazer tributes of wonder and admiration at his magnificent appearance. He will be a superb object in the heavens during the frosty nights of November, when the moon is out of the way, and for three months to come he will outrival every member of the starry host in the nightly pageant. He is only 13 days behind Saturn in reaching the same goal, and passes the meridian when in opposition at 42 minutes past 11 o'clock, 40 minutes behind Saturn. Jupiter is now about 408,000,000 miles from the earth, instead of 591,000,000 miles, as when farthest away—183,000,000 miles, the difference in distance, is something our finite powers can form little conception of, but it is of significant dimensions in celestial distances. For the distances of the earth from the sun, more than 90,000,0000 miles, is the unit of measure for computing the distances of the fixed stars. Alpha Centauri, the nearest star in the myriad host, is estimated to be more than 200,000 times as far from us as the sun. In comparison with these distant shining orbs, Jupiter is our near neighbor, and his mean distance from the sun is not much more than five times greater than our own.

ELECTRICAL INSECT.—It is not generally known that there are insects which possess the peculiar electrical properties of the raia torpedo and *gymnotus electricus*. Kirby & Spence, in their Entomology, describe the *reduvius serratus*, commonly known in the West Indies by the name of the wheelbug, as an insect which can communicate an electric shock to the person whose flesh it touches. The late Major-General Davis, of the Royal Artillery, well known as a most accurate observer of nature, and an indefatigable collector of her treasures, as well as a most admirable painter of them, once informed me that, when aboard, having taken up this animal and place it upon his hand, it gave him a considerable shock, as if from an electric jar, with its legs, which he felt as high as his shoulder; and dropping the creature, he observed six marks upon his hand where the six feet had stood. Two similar instances of effects upon the human system resembling electric shock, produced by insects, have been communicated to the Entomological Society by Mr. Yarrel; one mentioned in a letter from a Lady de Grey, of Grobz, in which the shock was caused by a beetle, one of the common *elateridae*, and extended from the hand to the elbow on suddenly touching the insect; the other, caused by a large hairy lepidopterous caterpillar, picked up in South America by Capt. Blakeney, R. N., who felt on touching it a sensation extending up his arm similar to an electric shock of such force that he lost the use of his arm for a time, and his life was even considered in danger by his medical attendent.

MALLEABLE IRON.—M. Forquignon has published an extensive series of researches upon malleable iron and the re-heating of steel. Among other conclusions he attaches special importance to the following: 1. Malleable iron always contains amorphous graphite; 2. A casting may lose carbon and yet remain brittle if the original quantity of graphite is not increased; 3. A casting may become malleable without losing any sensible portion of its carbon; 4. If silicium is added to manganesian castings they are improved by reheating; 5. Hydrogen and nitrogen may unite with the carbon of a casting so as to make it malleable without the production of graphite; 6. The breaking load is always more than doubled, sometimes more than quadrupled, by annealing. It increases with the duration of the heating, very rapidly at first and then very slowly; 7. Ductility generally increases with the resistance to breaking, but after a certain limit it has a slight tendency to diminish.—*Ann. de Chim.*

Electric Lighting by Incandescence.

Experience has quite clearly shown that the only practical electric light for general use, must be derived by incandescence. The unsteadiness of such light from carbon points appears insurmountable. Hence, every effort in the way of finding or devising some more enduring material for incandescence, is hailed as another important step in the progress of electric lighting. The latest improvement in this direction is announced by J. Swan, in a paper read before the late meeting of the British Association at York.

The carbon shown by Mr. Swan was made from cotton thread treated with sulphuric acid, and then carbonized at a high temperature out of contact with the atmosphere. Paper is also prepared in the same way. By this mode of treatment the carbon, when last fall upon any hard substance, give out a metallic ring. The fiber, on close examination, seems welded together like the fibers of wrought iron. The carbons are very hard and at the same time most wonderfully elastic, an important point in securing durability. After being subjected for a while to the extreme heat of the electric current, the carbons appeared to develop increased hardness and durability for incandescence.

Sir Wm. Thompson, the distinguished English electrician, has experimented with these carbons with most satisfactory results. He reports a production of 390 candles per horse power. A lamp which gives, at a fair working power, a light of 50 candles, is capable of being pressed to 500 candles before the carbon is destroyed. Under such a pressure the light is described as fully equal in intensity to the arc light. So great and so susceptible is the incandescent power of these carbons, that, according to the paper read before the association, when a gas engine is employed to drive the dynamo-electric machine, the very remarkable result is arrived at that more light is thus obtained from a given quantity of gas exploded in the gas engine, than can be obtained from the burning of the gas in the usual way of producing gas light. The light, however, is very sensitive to irregularities of speed, so much so that even the overlap of the driving belt, causes the light to wink perceptibly at every passage of the joint over the pulley. With a proper speed regulation the light is more steady than the best gas light.

The paper concludes with the following paragraph: "Now that we can look to the method of electric lighting by incandescence as a perfectly practicable method, and now that we have the means of combining the economy of the mechanical generation of electricity with the constancy and many conveniences of voltaic accumulation, it is clear that the time is now ripe for the almost unlimited application of electric light to general purposes, and that engineers may, with much advantage, give their immediate attention to the many details which fall within *their* province in connection with the mechanical production and distribution of electricity on a large scale."

THE ABSORBING CAPACITY OF THE EARTH.—The generally accepted notion that the capacity of the earth for absorbing moisture is increased by a long continued drouth is entirely incorrect, the very opposite being the case. After a period of very dry weather, the surface of the earth becomes hardened, and to a certain degree impervious to water, and the first heavy showers that fall run off into rivulets and water courses, moistening the soil only to a very slight depth. The absorbing capacity of the earth is increased in proportion to the amount of moisture it receives, until it reaches a point of saturation, and then the water goes to feed springs and underground reservoirs. This can be easily exemplified in the case of pots containing common house plants. When the earth in these pots becomes very dry, and water is poured on the surface, it remains quite a while on the top without descending through the soil. But if, after the first application is soaked up, more water is applied, it sinks through the earth at once and disappears. After the earth is saturated with water, the latter flows through the hole in the bottom of the pot. So that great floods are always more liable to result from heavy rains succeeding very dry weather than from like rains coming after the ground has been soaked gradually by small showers.

CONSTITUTION OF COMETS.—M. Prazmowski concludes, from observations since 1858 by the spectroscope and polariscope, that comets are formed of a condensed portion, which constitutes the nucleus, surrounded by an incandescent gaseous atmosphere, which contains carbon and reflects the solar light, and of a swarm of disaggregated material which is not controlled by the cometary attraction but moves in obedience to universal attraction. In some comets the polarization of the light is strongly marked, while in others it is almost wholly absent. In the latter case he compares the structure to that of atmospheric clouds.—*Comptes Rendus.*

PURIFYING BISULPHIDE OF CARBON.—To purify bisulphide of carbon it has been proposed to agitate it with a concentrated solution of permanganate of potash till the violet tint produced becomes permanent, showing that the reducing action has ceased. The bisulphide is then washed with water, and, being so much heavier, is easily separated by a separating funnel. The result is a pleasant, ethereal-smelling liquid that must be kept from the action of light.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Nov. 10.		Week Ending Nov. 17.		Week Ending Nov. 23.		Week Ending Dec. 1.	
Alpha	3.95	3.80	3.55	3½	....	....	2.90	2¾
Alta	5¼	4¾	4.80	4¾	4.80	4.15	4.55	4.10
Andes	1.60	....	1.60	1½	1.35	1	1.20	1
Albion	2.40	1.55	2.40	1.65	2	1.90	1.95	1¾
Argenta	....	....	....	....	10c	....	....	....
Addenda	10c	....	10c	....	5c	....	....	....
Belcher	3¼	2.85	3.35	3.05	3	2.15	2.55	2.10
Belmont	30c	....	....	....	30c	....	....	....
Best & Belcher	12	11¾	11¾	9½	9¾	8¾	8¾	8
Bullion	1.80	1.60	1.65	1½	1½	1¼	1¼	1.15
Bechtel	60c	50c	50c	....	50c	45c	45c	25c
Belle Isle	....	....	20c	....	15c	10c	15c	....
Bodie	6¾	5	7¾	5¾	5¾	4¾	4.60	4¼
Benton	90c	70c	95c	75c	90c	....	85c	75c
Bulwer	2¼	....	....	....	....	....	2¼	2.30
Boston	25c	....	25c	....	....	....	15c	....
Black Hawk	....	....	10c	....	5c	....	5c	....
Belvidere	....	....	....	....	25c	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	40c	35c	35c	25c	35c	25c	25c	20c
California	75c	70c	75c	65c	65c	45c	55c	50c
Challenge	85c	80c	70c	....	70c	....	60c	....
Chollar	2.15	2	2	1.70	1.65	1.45	1.65	1.45
Confidence	3.95	....	3.10	3	3.10	2	2.40	2.20
Con Imperial	20c	....	20c	15c	15c	10c	15c	10c
Con Virginia	2.35	2.20	2.30	2.15	2.10	1.85	1¾	1¾
Crown Point	2¼	1.95	2.10	1¾	1.85	1¼	1.40	1.15
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	1¼	....	1¼	1.05	1¼	1.15
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	20c	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1.95	1.80	1.90	1.85	1.90	....	1.90	1.80
E. Mt. Diablo	35c	....	35c	30c	40c	25c	60c	40c
Eureka Con	17¼	16½	17¼	16½	17¾	17	16¾	16
Exchequer	1.40	1.35	1.40	1¼	1¼	1	1.20	1.05
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	40c	20c
Golden Gate	....	....	2¼	2¼	2¼	2¼	2¼	2¼
Goodahaw	35c	....	50c	30c	50c	45c	55c	40c
Gould & Curry	6¾	....	6¾	5¾	5¾	5¾	6¾	5¾
Hale & Norcross	3.60	2.95	3.55	3	3.05	2.70	3	2.60
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	15c	....	....	....	....
Julia	40c	30c	30c	....	25c	15c	20c	10c
Justice	1.05	90c	1	85c	85c	65c	80c	60c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2¼	....	2¼	....	2¼	2	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	20c	....	15c	....	15c	....	20c	15c
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	1½	75c	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1¾	1½	2	....	2	1.90	2	....
Martin White	3¼	....	3	....	2	....	....	....
McClinton	....	....	....	....	....	....	....	....
Mono	2.35	1¾	2¼	2	1.80	1.35	1.40	1.30
Mexican	9¾	8¾	9¾	8	7¾	7	9¾	7
Mt. Diablo	6¾	6	5¾	....	6¾	5¾	6¾	6
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	40c	35c	35c	30c	40c	25c	50c	40c
New York	15c	10c	20c	....	....	....	5c	....
Northern Belle	14¾	12¾	13¾	12¾	12¾	10¾	11¾	11
North Noonday	10c	....	10c	....	10c	5c	30c	25c
Navajo	....	....	....	....	....	....	....	....
Occidental	1¾	1.10	1¾	1	1.35	1.05	15c	....
Ophir	7¾	7	7¾	6¾	6¾	6	6¾	5¾
Original Keystone	....	....	....	....	....	....	....	....
Overman	2.65	2.40	2.90	2.45	2.85	1¾	2.20	1.85
Oro	35c	30c	35c	25c	20c	....	25c	20c
Paris	....	....	....	....	....	....	....	....
Potosi	2¼	1.95	1.95	1.70	1.55	1.45	1.60	1.40
Queen Bee	....	....	....	....	....	....	....	....
South Bulwar	10c	....	10c	....	....	....	20c	5c
Savage	3.65	3.35	3¼	2.85	3.15	2.80	3.05	2.80
Seg Belcher	8¾	8	8¾	7¾	8	....	6¾	....
Sierra Nevada	16	13¾	14¾	11¾	11¾	9¾	11¾	9¾
Silver Hill	25c	20c	25c	15c	20c	15c	20c	10c
Silver King	19¾	....	19¾	....	20	19¾	19¾	19¾
Succor	....	....	....	....	....	....	....	....
Summit	15c	10c	....	....	....	....	....	....
Scorpion	1.60	1¾	1¾	1.20	1.30	1.05	1.40	1.10
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	30c	20c	30c	25c	30c	20c	15c	....
Tioga Con	25c	20c	25c	....	20c	10c	....	....
Tiptop	5¾	....	6¾	....	5¾	....	5¾	5
Tuscarora	....	....	....	....	20c	....	....	....
Union Con	13¾	12	13¾	10¾	11	9¾	14¾	9¾
Utah	7	6¾	6¾	6¾	7¾	7	8	6¾
Ward	3	....	....	....	3	....	....	....
Wales	....	....	....	75c	....	....	75c	....
Yellow Jacket	5¾	5¾	5¾	4.20	4.40	3.50	3.95	3.30

Sales at S. F. Stock Exchange.

Thursday A. M., Dec. 1.

100 Alpha 2.90
520 Alta 4.20@4¼
80 Andes 1.15
775 Belcher 2.10@2.15
100 B & Belcher .85
200 Bullion 1¼
120 Benton .80c
385 California .55@.50c
225 Con Virginia 2.15
25 Chollar 1.65@1.60
200 Crown Point 1¼
400 Caledonia .25c
20 Challenge .60c
130 Gould & Curry .62@.61
250 Golden Gate 2¼
380 Hale & Nor 2.60@2¾
1380 Julia .15@.20c
620 Mexican .9¼@9
450 Ophir .6¾@7
410 Overman 2.05
200 Potosi 1.55
925 Savage .3
405 Sierra Nevada .11¾@11¾
125 Scorpion 1.40@1.35
85 Silver Hill .20c
85 Utah .7¾@8
2560 Union .13¾@14¾
150 Yellow Jacket 3.95@3.90

AFTERNOON SESSION.

890 Albion .2
400 Black Hawk .5c
15 Bodie Tunnel 1¾
170 Bodie .4¾@4.15
100 Bechtel .45c
10 Bulwer 2.45
10 Concordia 1¼
50 Day 1.90
25 Eureka Con .16¾
200 E Mt Diablo .50c
200 Eureka Tunnel 2.10@2.05
100 Goodahaw .40c
100 Holmes .30c
200 M White 2
49 Mono 1.20
50 N Noonday .30c
700 Oro .25c
200 Queen Bee .5
300 S Bulwer .20c
200 Star .25c
80 Silver King .20
175 Tiptop .5¾
100 Wales .50c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Horn Silver, Nov. 25th, $32,500; Barbee & Walker, 25th, $1,607; Horn Silver, 22d, $17,500; Richmond, 26th, $20.192; Horn Silver, 23d, $20,000; Wood River, 23d, $2,625; Hananer, 23d, $2,050; Standard Con., 26th, $82,381; Bodie Con., 26th, $5,272; Horn Silver 22d, $10,000; Tintic, 22d, $2,781; Barbee & Walker, 22d, $1,467; Northern Belle, 23d, $6,326; Wai Wera, 23d, $3,304; Christy, 26th, $2,361; Contention, 21st, $12,723; Bodie Tunnel, 25th, $2,571; Eureka, 16th to 21st, $16,515; North Belle Isle, 25th, $9,500; Head Center, 28th, $4,303; Star, 21st, $2,892; Northern Belle, 25th, $7,903; Bodie, 25th, $5,272; Silver King, 23d, $19,278; Independence, 30th, $6,000.

THERE have been 3,301 locations recorded in Wood River country since January 1, 1879. Doubtless 1,400 of this number was made this year. Of course, hundreds of claims have been staked off and left without recording.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Albion Con M Co	Nevada	9	30	Nov 25	Dec 29	Jan 19	D B Chisholm	327 Pine st
Alexander M Co	Neavda	1	3 00	Oct 31	Dec 3	Dec 21	A B Cooper	328 Montgomery st
Betty O'Neal M Co	Nevada	2	25	Nov 14	Dec 19	Jan 5	R W Heath	318 Pine st
Belmont M Co	Nevada	30	15	Nov 11	Dec 19	Jan 16	J W Pew	310 Pine st
Black Hawk G M Co	California	13	10	Nov 9	Dec 17	Jan 4	H A Charles	419 California st
Bonanza M Co	Nevada	1	15	Oct 31	Dec 3	Dec 20	J B Treadwell	404 California st
Bodie Tunnel & M Co	California	5	50	Oct 20	Nov 24	Dec 21	C C Harvey	304 California st
Holmes M Co	Nevada	3	10	Nov 8	Dec 12	Jan 3	E A Holmes	318 Pine st
Kentuck M Co	Nevada	17	30	Nov 23	Jan 3	Jan 23	J W Pew	310 Pine st
Lord of Lorn M Co	Nevada	2	10	Oct 8	Nov 17	Dec 19	R N Van Brunt	318 Pine st
Morning Star M Co	Nevada	1	25	Oct 19	Nov 22	Dec 21	J B Moholm	331 Montgomery st
Mt Potosi M Co	Nevada	8	25	Oct 20	Nov 21	Dec 12	W J Taylor	330 Pine st
North Noonday M Co	California	4	25	Oct 26	Dec 1	Dec 23	W J Taylor	330 Pine st
Noonday M Co	California	4	25	Oct 26	Nov 23	Dec 20	W J Taylor	330 Pine st
Nor h Standard G & S M Co	Cal	2	10	Nov 30	Jan 3	Jan 21	C W D Huhbard	310 Pine st
Oro M Co	California	10	10	Nov 16	Dec 17	Jan 4	W Stuart	320 Sansome st
Original Keystone S M Co	Nevada	5	25	Nov 29	Jan 3	Jan 25	F E Lnty	1330 Pine st
Overman S M Co	Nevada	51	50	Oct 17	Nov 17	Dec 8	G D Edwards	414 California st
Pinal Con M Co	Arizona	1	25	Nov 19	Dec 27	Jan 16	W W Traylor	309 Montgomery st
Potosi M Co	Nevada	7	50	Nov 11	Dec 14	Jan 4	W E Dean	309 Montgomery st
Quartz Mountain M Co	California	13	75	Oct 7	Nov 14	Dec 5	E Heatris	729 Montgomery st
Savage M Co	Nevada	48	50	Nov 3	Dec 6	Dec 27	C B Hinds	328 Montgomery st
Tuscarora M & M Co	Nevada	9	15	Oct 17	Nov 22	Dec 14	M E Sperling	309 California st
Utah S M Co	Nevada	36	2 00	Oct 13	Nov 16	Dec 6	G C Pratt	309 Montgomery st
Union Con S M Co	Nevada	18	1 00	Oct 10	Nov 14	Dec 5	J M Buffington	309 Montgomery st
Yellow Jacket S M Co	Nevada	42	1 00	Oct 4	Nov 9	Dec 6	N Otey	

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Buckeye M Co	California	4	50	Nov 10	Dec 19	Jan 19	W H Lowden	213 Sansome st
Benton Con Co	Nevada	6	25	Oct 14	Nov 18	Dec 8	W H Watson	302 Montgomery st
El Dorado W & M Co	California	19	75	Nov 12	Dec 22	Jan 16	E M Welch	524 Sacramento st
Franklin Gravel M Co	California	7	30	Oct 14	Nov 14	Dec 5	G R Spinney	310 Pine st
Goodshaw M Co	California	9	15	Oct 12	Nov 17	Dec 8	Chas O Harvey	309 Montgomery st
Golden Fleece Gr M Co	California	23	40 00	Oct 23	Nov 30	Dec 19	F Schinnier	785 Folsom st
Home G M Co	California	8	3	Oct 20	Dec 3	Dec 21	R Ellon	330 Pine st
Iowa M Co	Nevada	15	05	Nov 9	Dec 17	Jan 5	C C Leavett	411½ California st
May Flower Gr M Co	California	13	10	Oct 12	Nov 16	Dec 7	J Morrizo	328 Montgomery st
Newcastle M. Co	California	2	02	Sept 23	Nov 15	Dec 5	E G Mathews	318 Pine st
Rocky Point M Co	California	9	05	Oct 12	Nov 14	Dec 5	D M Kent	330 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Bedrock M Co	——	C H Graves	6 Post st	Annual	Dec 15
Cataract and Wide West Gr M Co	Cal	W B Lake	240 Montgomery st	Special	Dec 15
Eintracht Gr M Co	California	H Kunz	209 Sansome st	Annual	Dec 6
Mayflower S M Co	California	H C Boyd	210 Montgomery st	Annual	Dec 21
Paragon M Co	——	C H Graves	6 Post st	Annual	Dec 5

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	California	W Letts Oliver	—— ——	20	Nov 19
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	Sept 27
Father De Smet M Co	Dakota	H Dean	New York	50	Oct 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Nov 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Nov 15
Silver King M Co	Arizona	J Nash	315 California st	25	Nov 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Nov 12
Western M Co	California	C S Curtiss	309 Montgomery st	75	Nov 10

Academy of Sciences.

The regular meeting of the California Academy of Sciences was held on Monday of last week, Vice-President J. P. Moore in the chair. Charles H. Bradford, John S. Doe and George Spaulding were elected life members.

The donations to the Museum were as follows: From Mrs. Hostetter, mortar and pestle from near San José, Cal. From W. J. Fisher, metate from Alaska. From J. G. Lemmon, cones of Pinus reflexa, Pinus Chihuahuna, Agave Schotti, Pinus edulis, Pinus Arizonica, wood and bark of Cupressus Arizonica.

From J. M. McDonald, insects found in Keystone mine 800 ft. vertically below the surface at Amador City, Amador county, Oct. 8, 1880, collected by Jas. F. Parks, foreman for the Keystone Con. Mining Co.

From R. W. Waterman, 18 specimens of dendrites, from specimens of heavy spar, sulphate of baryta—all from Mohave desert. From C. W. Brooks, specimen of flint.

Dr. H. Behr read a paper describing certain spiders found at a depth of 800 ft. below the surface in the Keystone mine in Amador county, Cal., describing their organization and probable ancestry. The paper we shall shortly print.

J. G. Lemmon read a paper on "Arizona Forest Trees," illustrating his remarks with specimens of branches, leaves, cones, bark, etc. This paper we shall publish in full shortly.

The two following self-explanatory letters were read:

Charles Crocker, President Southern Pacific R. R., San Francisco, Cal—DEAR SIR: In my absence from San Francisco on duty, I learn from the proceedings of the California Academy of Sciences, that you have given that institution, of which you have long been a member, the sum of $20,000, to aid in original scientific research.

As one of the workers in the cause for which the Academy was founded, for many years giving much of my unofficial time to its advancement, knowing the difficulties and the trials which it has encountered, and sharing the anxieties and the hopes and the earnestness of the the members, the council and the trustees, in its success, I ask that you will accept my sincere admiration and hearty thanks for this practical and munificent expression of your endorsement of the objects which prompt and sustain our labors.

I have ever contended for the beneficial and utilitarian ends which all pure scientific investigation must eventually serve, and I am certain, that on this coast especially, we shall see the people and the State benefited a thousandfold by such endowments. Believe me, very truly and sincerely,

Your Ob't Serv't,
GEORGE DAVIDSON,
Pres't Cal. Acad. Sci.

U. S. Coast and Geodetic Survey, Yolo Base Line, Nov. 10, 1881.

OFFICE OF THE SOUTHERN PACIFIC RAILROAD, COR. 4th & TOWNSEND STS. PRESIDENT'S DEPARTMENT.

Prof. Geo. Davidson, U. S. Coast & Geodetic Survey Station, Davisville, Cal. My Dear Sir: Your favor of the 10th inst., expressing your feelings on the occasion of my presentation of $20,000 to the Academy of Sciences, to aid in Original Scientific Research has been received, and I can assure you that it is very gratifying to me to receive letters of this character, from such distinguished men and workers as yourself.

I had long contemplated leaving a sum of money in my will for this purpose, but thought I was likely to live too long, and so concluded to do it while alive, fully impressed with the belief that it would be well and faithfully disbursed by your society. Yours very truly,

CHARLES CROCKER.

San Francisco, Nov. 12, 1881.

The Mining Share Market.

During the latter part of this week stocks looked up a little, particularly Union Con. A telegram from Virginia on the 20th, very encouraging, was as follows: The drift on the 2400 level of the Savage last evening reached the point where the incline will strike said level. If they cannot start the water out of the incline by firing a heavy blast at the bottom, they will tap it with the diamond drill. They are extracting 80 tons of ore per day.

A winze is being started on the 2500 level of the Sierra Nevada, at a point where low-grade ore was found while Senator Fair was in charge. The joint Sierra Nevada and Union Con. winze, in which the ore was found, is now nearly down to the 2800 level. It has cut through many streaks and seams of ore, all of which were dipping to the east.

At the north end work is progressing well in the Sierra Nevada and Union Consolidated. The 2700 station of the Union shaft and the joint winze will be connected in about 10 days. Once this connection is made there will be obtained a circulation of air which will permit of much prospecting being done.

At the joint Mexican and Union Consolidated winze the drill will soon be started from the 2700 station to guard against water, and if it shall be found safe to extend the drift now started, it will be pushed ahead. It will pass into some very interesting ground.

The *Free Press*, speaking of the mines at Bodie, says:

We believe that the Noondays will some day be great mines, so will Oro and Addenda and all that group of locations. The formation is such as to lead to such a conclusion. When the 1000-ft. level is reached in the Oro and the ground explored, there will be an ore body exposed that will astonish the country. The west cross cut on the 600 ft. level of the Red Cloud is approaching a good country, and things are liable to pop there some day, to use a street expression. The Bodie Tunnel people expect to get their mill in working order by the 1st, and then ore crushing will be resumed in good earnest. There is no change in the Syndicate, the ore production being about the same as previously reported in these columns.

In addition to the regular dividend the Standard pays this month an extra dividend of 75 cents.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MEDIAN.—Amador *Ledger*, Nov. 26: Work has been suspended for the present at both mine and mill. While the rock crushed paid more than expensee, still there is not sufficient ore in sight in the mine to justify entering upon another crushing. The shaft must be sunk deeper, and the mine opened up, and this the stockholders are not prepared to do right away, and hence the suspension of work until next spring. It is believed that the Median will turn out a permanent mine.

MORGAN TUNNEL.—On good authority wo are able to state that in the opinion of expert mining men, the ledge has undoubtedly been penetrated by the tunneling operations. It is badly broken up, it is true, but the hope is held out that the ore bodies will come together and form a well-defined ledge at a greater depth. The work of tunneling will be continued probably through the winter, but nothing will be done in the matter of putting up a mill until next spring.

MISCELLANEOUS.—A serious cave occurred in the shaft of Doyle's claim, in Hunt's gulch lately. Something like 100 tons of earth caved, putting an effectual embargo upon the further prosecution of prospecting operations. J. J. Stewart, of Butte, and Lowell, of San Francisco, are operating a quartz claim in a gulch about half a mile from Big Bar bridge. There is a shaft, 60 ft deep, on the property, which shows some quartz at the bottom. Work at present is confined to running a tunnel from the gulch to strike the ledge at a point 40 ft below the shaft. At the mine lately sold by Owen Kelly to Boston capitalists, everything looks lively. The indications under ground are sufficiently satisfactory to warrant the putting up of a mill. The 20-stamp mill at the Montirichard mine has been purchased, and is now being taken down for the purpose of being hauled to Hunt's gulch.

CALAVERAS.

CORRAL FLAT MINE.—Calaveras *Chronicle*, Nov. 26: Work is being vigorously pushed ahead in the Corral Flat mine. A very large quantity of gravel has been encountered in the drifts, which can be taken out very fast, faster in fact than it can be put through the mill. A clean-up, after a short run, was recently made, and though we are not informed as to the exact figures, we learned that it was highly satisfactory. A new pulley has lately been put in by which the mill can be run the requisite speed, and the pump and hoisting works kept in operation at the same time without running the pump beyond its regular speed. Everything is working well now, and the prospects for the mine to be remunerative are very favorable.

THE LAMPHEAR MINE.—The parties from Stockton who were here last week for the purpose of examining the Lamphear mine, have made a very flattering report in regard to the merits of the mine and considerable interest is being manifested in that piece of property. The parties report that the inducements for undertaking and working the mine were greater than what was represented. Especial pains were taken to learn the history of the mine, and the information obtained in every case was in its favor. We have known the mine for years, and we have always heard it spoken of by those who were best qualified to judge, that it is an excellent piece of mining property.

OLD JUDGE.—*Mountain Echo*, Nov. 22: The famous Old Judge mine, situated about one-half mile south of Douglas' flat, is again in working order. Some weeks ago a large body of earth settled into the main works, which, of course, necessitated considerable labor, in order to get everything in good working condition again. That task is now happily performed, and again the wheel of fortune moves.

EL DORADO.

JOSEPHINE.—Georgetown *Gazette*, Nov. 23: Supt. Hart, of the Josephine mine at Volcanoville, was down last Saturday, and left between $300 and $400 in this place, in payment for supplies, etc. We learn from Mr. Hart that their 10-stamp mill is kept constantly running, and that besides the force engaged in getting out ore and running the mill, they have three men at work making developments on other parts of the lode. The results so far are highly satisfactory. Their mine is on the east wall of the greenstone belt, and the ore resembles that of the Pacific mine at Placerville, which, we believe, lies against the west side of this same greenstone belt. The quartz mining outlook in this locality is really encouraging. Several mines about Georgetown have been bonded—some by bona fide capitalists and some by men for speculation in the event of a boom, which bids fair to visit this camp before next spring. During the past week no less than six mining capitalists have been up looking after mines in this vicinity. We understand that work of development is soon to begin on a number of our prospect mines, as well as on mines heretofore worked with varied success by men who did not possess the capital and energy to work their claims as they should be to make them profitable. Another large mining enterprise has just started up at Volcanoville, under the management of Geo. Bower, well known in the mining circles of this divide, and Archie Borland, one of the solid men of San Francisco. They have purchased the old Graves quartz claim, famed for its rich ore, and have christened it the Garfield mine. A force of men have already been put at work, and a tunnel will be driven in to tap the lode 100 ft below the surface. The public may rest assured that these men mean business. The North Cedarburg, Greenwood district, will be started up right away with full force, by W. N. Martin & Son. This noted mine bears a good record, few mines in the county surpassing it in its large yields. It was from this mine that the renowned $6,400 piece of quartz (about 18 inches square) was extracted some years ago. Martin & Son are now about to hydraulic and uncover the original ledge, which it is confidently believed will even surpass that part of the lode already worked in richness. We wish them success.

INYO.

MINING TROUBLE.—Inyo *Independent*, Nov. 29: On Tuesday last, at Darwin, an armed force of some 10 or 15 men proceeded to the Defiance mine and took possession, ousting the men working for Martin Mee, who claims the mine by relocation. There was no resistance offered. It is understood that the party acted for Reddy & Gormau, who recently purchased the title of Taber & Harker to the Defiance furnace and mine.

MARIPOSA.

DILTZ MINE.—Mariposa *Gazette*, Nov. 26: Capt. Diltz, owner of the Diltz mine, called upon us on Thanksgiving Day. All he gave us was a bit of information, that he had commenced operations upon the west end of his mine about 1,500 ft from the shaft and stope heretofore mentioned. The vein of auriferous ore continues the whole length of the claim, and enough has already been seen to convince anyone of its vast richness. The work in the stope and shaft still continues with good results.

THE NEW SILVER MINE.—In the issue of the *Gazette*, of Nov. 12th, in speaking of this mine, which is located near the Modesto silver mine, and owned by Mr. Moses May, of Modesto, an error crept in which we very much regret. We stated in the paragraph that "only one test had been made, which assayed $27 per ton," which should have read $2,700 per ton—some difference.

NEVADA.

CLAIM LEASED.—Nevada *Herald*, Nov. 26: James E. Frederick has leased his gravel claim at Columbia hill for six years, to the Meen Lee Hong Co. The lessees propose to work the mine by hydraulic process, and in order to do so, will run a bedrock tunnel, through which to wash their tailings. When the mine is fully opened they will employ

about 40 men. The Broderick claim is regarded as valuable mining property and the company who have leased it will probably receive good returns. A rich streak of blue gravel extends through the claim, and the gold obtained is very coarse. We are not informed as to the terms upon which the lease was made. We wish Mr. Broderick success in his future undertakings.

MURCHIE.—Nevada *Transcript:* The Murchie mine is looking well, and their 10 stamp mill is kept running night and day. Contracts to sink the shaft are to be let every month hereafter. If this mine was opened as many others are, in this vicinity, the company would be able to pay dividends. The Providence M. Co. are still making new improvements to their property. It is one of the best quartz mines in California and continues to pay its owners handsome dividends. It will take many years to take out the quartz that is in sight. Several New York capitalists are expected here in a few days to examine some of the idle mines in this vicinity which are known to be good, but cannot be opened without coin. The Cold Spring Co. are getting along very well with their tunnel. They have about 300 ft more to run to reach the pay channel. The Nevada City mine continues to look well, and the owners are perfectly satisfied with their property. The Hershman mine will be ready for work in about a week. They have nearly completed the necessary labor for starting up. The Wyoming mill is running night and day, and the rock that is being taken out is looking very fine. The stoppage of the hydraulic mines cuts off about a million per month in this county alone. If all the hydraulic mines in this county were being worked times would be lively. There are more quartz claims being worked in this township now than ever before in its history.

MONO.

STANDARD CON.—Bodie *Free Press*, Nov. 29: The shaft was sunk during the week 10 ft; total depth 1,110 ft. The character of the rock remains the same. The total length of the south drift on the 500 level is 450 ft showing the vein in the face to be 4½ ft wide. The different stopes show no particular change. All are looking well and yielding the usual quantity of ore. On the 385 level the ledge is 10 ft wide in the south and about 30 ft wide in the north end of the mine. On the 550 level the vein is 15 ft wide of clean ore. During the week there were extracted and shipped to the mills 1,274 tons of ore from the 300, 385, 500 and 550 levels. The average pulp assay for the week was $31.73. The amount of bullion shipped to San Francisco was $82,381.60.

BODIE CON.—There were 90.0 tons of ore hauled to the mill durlug the past week. On the 23d inst. connection was made between the south drift from winze No. 9 and the north drift from winze No. 6. The bullion shipment was $5,272 38.

NORTH NOONDAY.—An upraise has been started from the 512 to the 412 level. The No. 2 vein is larger and giving good assays. Ore for the mill is being stoped from the 212, 312 and 412 levels.

TIOGA.—The north lateral drift east of the shaft, 982 level, is now in 403 ft. On the 520 level some necessary work is being done in repairing the Syndicate tunnel.

BODIE TUNNEL.—The only work being done in the mine at present is repairing on Ledge No. 20 nnd enlarging the station nt the intersection of ledges Nos. 20 and 21. The tunnel has also beeo undergoing repairs. The chutes are being filled up with ore in enticipation of the mill being completed hy the 1st, and ready for crushing on the 5th. The supply of water for the new mill will come from the Bulwer-Standard mill, nnd a large force of men are now engaged in making a ditch for the pipe.

NOONDAY.—Ore is being stoped from the 212, 312, 412 and 512 levels and the mill kept steadily nt work.

PLUMAS.

A WONDERFUL MOUNTAIN.—Orcenville *Bulletin*, Nov. 23: The mountain just south of Greenville is certainly a wonder. Rising to a hlghth of about 2,000 ft above the valley, it is covered with a rich growth of giant pines to its summit. On nearly the whole of its circumference it has been pierced by tunnels, but these tunnels have not yet gone much below the surface. As the tuanels are driven deeper, the ledges get widor and the ore richer. The Oakle Canyon mine, the Green Mountain, Crescent, Taylor, Plumas, Indian Valley, Union, New York, Cherokee and Southern Eureka mines; all of theso ere in this mountain. Many other unnamed ledges, as good as any now being worked, are located, but not worked, the owners being too poor to put up the requlred mechinery. Meny of the ledges are from 5 to 30 ft in width, and of uniform richoess for hundreds of feet nlong the ledge. When the necessary capitnl, energy end skill nre united for its thorough development, this mountain will yield millions of dollars to the wealth of the country.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—*Enterprise*, Nov. 27: On the 2700 level the joint Union Consolidated winze has been extended 47 ft nnd the west drift 19 ft.

OPHIR.—There has been 281 tons and 1,200 lbs of ore extracted from the croppiugs, nnd 474 sent to the mill.

UNION CONSOLIDATED.—At the joint Mexican winze have completed the 2700 statioh and put in guides and cages

UNION SHAFT.—Are repairing the drift to the Sutro tunnel on the 1600 level, and cutting out a hoh pit on the 2900 station.

UTAH.—Cutting out a stntion for a hoh pit at the 2250 level. The drill hole on the 2500 level has been advanced 105 ft.

CON. VIRGINIA.—Still doing work for ventllation purposes in drifts and winzes connecting with the old Con. shaft.

CALIFORNIA.—Still doing ventilation work on drifts and winzes connecting with the old Con. Virginia shaft.

MEXICAN.—At the joint Union Con. east winze have completed the 2700 station and put in guides and cage. On the 2700 level the joint Union Con. enst drill hole has been extended 60 ft.

ALTA.—The drain drift on the 1250 level is also progressing well. The water is gradually increasing.

YELLOW JACKET.—The drill hole east from the face of the east drift at the face of the north lateral drift, on the 2824 level, is this day in 172 ft, and is still being advanced drilling shows quartz and porphyry, giving low assays. On the 3000 level the east cross drift has been run 33 ft, making the present length of the same 221 ft from the switch; ground hard, with litt'e water.

CALEDONIA.—Pumps have been run an average of 83 hours per day and consumed 4 cords of wood per day. Forman shalt has been sunk nnd timbered 15 ft; total depth 2,245 ft.

ALPHA.—Are repairing the old air pipe taken out of Imperial shaft and putting it down the incline to the 2000 level.

CON. IMPERIAL.—Have finished putting in the new pipe in the shaft and are now putting in the repaired old pipe in the incline down to the 2000 level.

HALE AND NORCROSS.—Since the final opening of the incline hulkhead, on the 14th inst., the west drifts on the 2000, 2100 and 2400 levels have been secured and closed up, thereby confining the heat to the 2200 level workings.

OVERMAN.—Have cut a station in the 2275 level for air receivers and moved them down from the 1600 level The drill hole on the 2275 level was run in the course of the drift 185 ft, when the rod broke and we had to abandon the hole.

SOUTH TONNEY.—Report for the week ending Nov. 22: The distance of the face from the Yellow Jacket turning point is now 1,865.23 ft, and to a point 200 ft west of the Forman shaft, 1,568.08. South lateral, repairs—The repair shift put up 4 sets of new timbers and removed 2 old sets, besides lagging up and making the usual repairs. They have also been employed a portion of the week in cutting out for the new cooling station and moving the switch.

BRISTOL DISTRICT.

TEMPEST AND MAYFLOWER.—Pioche *Record*, Nov. 19: The two Bristol bonanzas, the Tempest, the property of Messrs. Gilmer, Salisbury & Co., and the Mayflower of the Bristol Silver Mining Co., are pronounced by experts to be two of the biggest mines in the State to-day. Both have huge bodies of high grade ore in sight, of unknown extent, and those who have worked in the Raymond & Ely say that the Mayflower and Tempest are away ahead of that mine at its best days. By next spring, when the Tempest and Iron mine reduction works are erected, and the Bristol mill in trim, Bristol will show an output, with the Day silver mining company, of over $300,000 per month; a showing that will place Bristol to the front as one of the leading mining camps of the coast. The Bristol mill is still pounding away on $200 rock, chipping this week by Wells, Fargo & Co.'s express five bars of bullion, 984 fine, valued at $11,210; making a grand total of over $26,000 for the 13 days that the mill has been running. This is certainly a splendid showing, but as the ore is very moist and the facilities for drying are somewhat limited, the battery is consequently not worked up to its full capacity, but arrangements are now being made for doing away with these drawbacks, and an additional 10 stamps added, which will then enable the company to turn out $75,000 a month. The Bristol furnace of the Day company, after a long and successful run, was closed down last Friday. The ore that is coming down is of a high grade and easily worked, and by the time the furnace starts up again, which will be in about 2 weeks, there will be several hundred tons of this character of rock on the dump, which, with the heavy lead ore that is being shipped from the Mendha, this next run will surely be as profitable a one for the company as the last.

BULLION MINE.—The Day Co. has placed a few men at work prospecting in the mine. The old miners, who worked in the mine when it was yielding large quantities of good ore, say that the formation of the ground denotes a large body of ore somewhere in the immediate vicinity.

CANDELARIA DISTRICT.

LUCKY HILL.—*True Fissure*, Nov. 20: Under the energetic superintendence of Mr. Mechling this mine has had new life put into it. At a depth of 260 ft on the incline 2 crosscuts have been started—1 to the southwest and the other to the northeast. These crosscuts are from the east drift and have attained a distance of 26 and 37 ft respectively. The formation in the southwest crosscut has been a little refractory and progress has been necessarily slow, but in the northeast crosscut the ground has broken well. Some disadvantage has been encountered in handling the waste while waiting the putting in of a turntable and laying track.

MOUNT DIABLO.—Connection has been made between the intermediate and the north crosscut from the bottom of winze No. 1. At this point there is a bunch of ore about 2 ft wide on which an upraise hes beeu started. The ore essays from $60 to $80 per ton. In the east drift, from this crosscut, there is a 10-inch streak of $70 ore that looks extremely promising for opening. A drift is being run easterly from the north crosscut at the bottom of winze No. 3, on the third level, which is in 15 ft. The east drift on this level has been following a seam of $85 ore during the past few days that looks very well.

NORTHERN BELLE.—The fourth shaft level has shown no very material chenge during the week The west drift has been extended 12 ft in favorable looking ledge matter giving low nssays. The upraise is also in a promising formation. There are being extracted and sent to the mills about 60 tons of ore deily. Both mills are running as usual and doing the regular amount of work. Bullion shipments for the week endmg Nov. 23d amounted to $20,037 69. Shipmeats on November account to Nov. 23d, $90,896 95.

CHERRY CREEK DISTRICT.

THE TEACUP SWINDLE.—White Pine *News*, Nov 26: Last Monday being the day on which the Teacup Co.'s notes fell due, there wesn leverish excitement among the holders of notes here to learn if they would be paid as per agreement. Supt. Smith was consulted, but that hitherto ever-hopeful represen'ative of the company could give no assurnnce. He knew nothing about the matter. Later in the day a telegram was received from Wells, Fargo & Co.'s banking house in New York, stating that the notes had gone to protest. Then a rush was made for Justice Lander's office, and attachments were issued on every detnched piece of property at the mill or mine. Suits were also commenced in the District Court nt Hamilton against the property of the company. It is now apparent to our people that, from first to last, this New York corporation was nothing but a swindling concern.

ESMERALDA DISTRICT.

HUMBOLDT MILL AND MINING COMPANY.—Esmerelda *Herald*, Nov. 26: At the mill the meu are still at work prepering for the machinery. At the mine developments are being made to prepare to take out ore when the mill is ready to crush.

THE CENTENNIAL MINE.—Messrs. Oroth & Ball are still at work at the bottom of the incline and pushing downword. The ledge shows no signs of "petering." By spring the owners will have developed a million or more.

THE CORTEZ MINE.—The lower tunnel has reached the ledge, and now the miners are engaged in making the connection with the incline shaft on that level, the tunnel having struck the ledge some distance from the incline shaft. Everything moving along nicely.

EUREKA DISTRICT.

EUREKA CON.—*Sentinel*, Nov. 26: Supt. Reed writes to his company nt San Francisco as follows: Nothing new to report in relation to the mine this week. The 240 squares of tin roofing arrived for the Locan shaft, and is now being put on the building. The furnace is working and reducing the usual quantity of bullion.

ARIZONA.

DOSORIS CAMP.—Arizona *Democrat*, Nov. 25: Supervisor Cline came in yesterday from the Dosoris camp. We learn that prospectors are busy at work in that neighborhood, and with good results. Work on the Dosoris is pushed steadily along. They are down at least 50 ft in the main prospecting shaft. Joseph Taylor is foreman, and has three shifts of men at work in this shalt and two shifts stoping ore. There is also n force of men prospecting on the Buzzard. There are three shafts on this claim, and a fine showing of rich ore. The Raven is standing idle at present. The ore is chiefly chloride and argentiferous galena. There is a business air pervading the camp. This camp will soon be producing bullion. Townsend Cox and his syndicate are now heavy New York capitalists, and we are glad to note that their plant in our county bids fair to be a bonanza.

HACKBERRY ITEMS.—This village is assuming metropolitan airs on account of the near approach of the railroad. The people are waking up from their long sleep of the past few years, all caused by the closing up of the quartz mill at this place. There are several well paying mines in this vicinity, but they are unable to work them on account of the great cost in getting machinery and tools The opening of the railroad to this place will be the signal for a better time. A Boston company has got control of the quartz mill here, which they are overhauling and repairing, and will start up as soon as they can get machinery enough to run it. This place is sure of one railroad, and the prospects are that it will have two.

BIG BUG.—Cor. Arizona *Miner*, Nov. 25: During the past week we paid a visit to the Sterling, a mine owned by Messrs. Stevens and Betts. They have a shaft down about 58 or 60 ft, with a pay streak of 24 inches in the bottom, an average of 20 inches for the last 10 ft, and an average of 16 inches for the entire length of shaft. Their ore assays from $52 to $374 in silver and some gold, with an average assay of $142. We were also shown the Nonesuch, a mine owned by Mr. Stevens. He has a tunnel started in along the vein, and a fine, large body of ore on the dump.

NOTES.—Arizona *Sentinel*, Nov. 24: O. F. Townsend has just completed the survey of the Bull Dog mine, East Silver District. Work is about being started on this promising ledge. The Iron Cap Co. early in January will renew operations upon their mine, in a lively way. It is the intention of the company to thoroughly develop the Iron Cap, which is already one of the deepest mines in the district, and few if any can make a better showing. Mr. Thos. Ollchrist has purchesed all of Mr. Iager's interest in the "Daniel Broone," "Offspring," "Outside" and "Remnant." Tom has unbounded confidence in the camp; also bought out Sam Dyer in the "Remnant." The output of ore on the Black Rock continues as large as ever, and seems to increase in richness. This property is being developed in a systematic and business-like manner, and will undoubtedly prove a heavy bullion producer at an early day. A rich strike has been made in the Silver Glance mine. A large body of sand carbonates has been opened up, in the tunnel, besides a streak 18 inches wide of high grade sulphuret ore. Mr. A H. Cargill is to be congratulated upon his bonanza.

NOTES FROM DOS CABEZAS.—Arizona *Journal*, Nov. 22: From Mr. A. E. Fay it is learned that the Cincinnati and Pittsburgh company, at Dos Cabezas, have their new 20-stamp mill nearly ready for operations. While they own several promising mines in that district, they propose to do custom work, and thus offer inducements for poor miners to develop their own properties from the proceeds of the ore milled. Mr. W. W. Tice is the superintendent of this company. Mr. W. A. Nevills, superintendent of the Commonwealth Co.'s mines, is pushing work as rapidly as possible, with the very best prospects of rich returns. The Bear Cave mine, upon which he is concentrating a large force, shows a large body of rich ore, and it is thought will prove equal to any in Cochise county. The outlook for Dos Cabezas is exceedingly bright.

STRIKE IN SILVER BELT.—On Saturday night the workmen in the Silver Belt struck a vein of red ore, similar in appearance to that of Grand Central. The vein dips quite flat to the west, as the ledge does further south. While the ore thus far taken out has no great value, the strike itself is of the greatest possible interest to the district proving conclusively that the great Contention lode continues directly on to the northward towards the mesa. The strike is in a drift running west from the shaft and about 150 ft therefrom, bringing the lay of the vein at this point on the direct line of the ledge, as traced from Grand Central through Contention, Head Center and Tranquility. A few weeks will be required to determine how extensive the ore is likely to prove this far north on the lode.

TYNDALL DISTRICT.—Arizona *Journal*, Nov. 20: There is great activity at present all through the Santa Rita mountains in mining matters. This is especially true of Tyndall district. Mr. A. B Casey has commenced the preliminary foundation for a water jacket furnace, which will be put up without delay. Several important sales affecting property in this district are now being negotiated. Mr. James Campbell will commence work on the group of mines in which he was formerly largely interested, in behalf of the Eastern capitalists who have recently come into possession of the property. This syndicate represents ample capital, and as the property has always ranked very high as a prospect, we anticipate some very satisfactory results as the work progresses. The road from here to the district will be much improved by the new overseer, Mr. Mark Lully, who will commence work on it without delay.

A NEW ENTERPRISE.—Arizona *Journal*, Nov. 27: A company has just been formed in New York, called the O. K. Con. M. Co. They own 3 promising claims near Old Mowry, in Patagonia district, and will commence active work at once. The near approach of the Atchison, Topeka and Santa Fe road will render all these large bodies of low-grade ore in that vicinity very veluable. The new company starts out with the finest prospects. Mr. Covington Johnson, superintendent of the Hermose, is also superintendent of the new company.

RANDOLPH DISTRICT.—Pinal *Drill*, Nov. 19: Randolph District is 14 miles northwest of Pinel. Here ere several rich strikes nnd new locations. The Diamond Peak has large quartz croppings, which contain oxides and galena ores, beering silver. There are a large number of small veins, all centering in the main vein, very rich in appearance, with indications of gold. This mine is located hy Julius Baeuerlein, B. W. Kellogg and Thomns Oravce. The Snowflake, about 1½ miles easterly from the Diamond Peak, is in granite formation, carrying galena, chlorides and horn silver. The vein shows 3 ft wide on the top. The Germania, 2 miles southwest from the Snowflake; discovered and located by same. This is on another ledge with large croppings. The above mentioned parties also discovered a large gold ledge, which they traced for some distence, and washed out gold therefrom in a horn spoon, but had to leave on account of stormy weather.

COLORADO.

THE PELICAN AND DIVES.—Georgetown *Courier*, Nov. 24: Work at sinking the Pelicen-Dives mein shaft has now been suspended for about 3 weeks, on eccount of the flow of water being so strong that e pump will be necessary to keep the shaft clear while sinking is progressing. The shaft is 350 ft deep. Nothing new of importance has yet been developed in the lower workings. There are over 60 men employed in the mine, from 40 to 50 of them being lessees. The lease of Coughlin, Fitzpatrick & Co., in the stope over the 2½ tunnel level on the Unicorn, is in excellent pay, also the lease of Lampshire & Co., on the Eagle Bird. The other lessees are doing moderately well.

THE STEVENS MINE.—Work is steadily progressing at sinking the main shaft of the Stevens mine, which has now reached a depth of 160 ft below the tunnel level and 25 ft below the 11th level. The ore vein averages in the shaft and 11th level stope about 8 inches in thickness.

THE KING LODE.—A house is being built at the mouth of the adit on the King lode, situated on Bard creek and owned by Mrs. Ford, and as soon as it is completed work will commence at developing the lode.

THE PAY ROCK.—The working force of the Pay Rock M. Co. has been increased of late, there being now 64 lessees and 18 contractors employed. The monthly output has been increased steadily, though the effects of the work of the new men is not yet felt, as they all commenced in ground where there was no ore in sight, and the prospect now is that the yield of the mine will be increased considerably more than at present before next spring. The royalties of the lessees range from 20 to 35 per cent. Fourteen men are at work on the lowest level, 90 ft below the Silver Bank tunnel, drifting, stoping and cross cutting, and taking out good ore. The general appearance of the mine is excellent.

IDAHO.

COLUMBIA.—Wood River *Miner*, Nov. 26: The Columbia mill, at Sawtooth, is now completed all but putting up a few pieces of machinery. It is the equal of the Custer mill in the Yankee Fork district. It was constructed by the same firm, is the exact size of the Custer and has later improvements. The company will keep a force in the mines increasing their ore dumps.

THE Carrie Leonard mine, on Little Smokey, has been proven during the past summer to be very valuable property. Sufficient ore was shipped this year to pay all expense of development and dividends besides. There are now between 30 and 40 tons on the dump.

THE Pilgrim mine at Sawtooth is showing up its treasures to better advantage with every blast. Over 500 tons are on the dump and this will be more than doubled by spring. A force of 10 or 15 men will be employed in this mine during the winter.

NATIVE SILVER IN THE EUREKA.—Wood River *Times*, Nov. 26: A few weeks ago the *Times* stated that for the first time in the history of mining, chunks of native silver had been found in galena, at the Mayflower and Jay Gould mines. Now comes H. Stevenson, general accountant for all the leading bullion mines, who shows chunks of native and wire silver as big as one's fist, which were extracted from a recent find in the Eureka. This new strike was made on the tunnel lovel, about 115 ft from the face, last Monday afternoon.

BAY HORSE.—Salt Lake *Tribune*, Nov. 27: A gentleman just returned from Bay Horse, Idaho, informs us that the mines in that camp are developing far beyond the predictions of the most sanguine. This gentlemen declares the belief that the Bay Horse camp has yielded more bullion and more high-grade ore this season than any camp in Idaho. The Ram's Horn mine continues to be the king of the camp, and presents a wonderful record. Though never worked to its full capacity, it has produced 300,000 ozs. of silver, and has now on its dump and in sight in the mine, ore to make more bullion than has ever been taken out. All the way down the mine looks superbly, and in the lowest openings a splendid body of ore filled with native silver has been exposed. The Bay Horse people are most sanguine of the wealth of their camp.

MONTANA.

PHILLIPSBURG MINES.—*New Northwest*, Nov. 25: As the result of my customery weekly visit to the mines in the line of this district, I find that all of them, presently under development, show marked improvement. The new body of ore uncovered in the level west of the 400-ft cross cut in the lowest workings of the Algonquin mine continues the same, in width and value, as the header advances west. The grade of rock extracted is exactly the same in quality and appearance as that of first-class Trout, and judging from present indications the supply will soon be equal to all demands of the mill. The new holst over the Ememld mine is et last completed and under the careful supervision of Asst. Supt. Harvey Showers, this valuable property is fast assuming shape and form. The ore from the 50-ft level will average 50 ozs. throughout, while the output per day, after the mill starts up, will not exceed 25 tons of working ore. Sinking the Trout shaft is being pushed ahead with all dispatch. The shaft is now down 570 ft with 30 more to run before starting the new level. The Hope mine is a steady producer and the mill is kept at work on 50 oz. ore. A tunnel has been started on the south side of the mine to tap it below its lowest workings. The completion of this adit will greatly facilitate the extraction and handling of ores found at its introduction of the vein. The tunnel on the Orphan Boy is in 45 ft with 20 more to go. Messrs. Patton & Co. have e large quantity of surface ore in sight on the line of the vein above, and will certainly open out a mine when the foot wall is reached. The snow in the Granite has increased so in depth that the development of last summer discoveries must of necessity be laid over until spring. Then roads will be constructed to the principal mines, which will allow them to be worked at ell seasons.

NEW MEXICO.

CARBONATEVILLE.—Cor. Los Vegas *Mining World*, Nov. 15: At no time since the organization of this camp has there been so great an amount of work going on, and of such magnitude, as at present, while the camp is kept red hot with excitement over new and rich strikes that are being made nearly every day. A strike of rich ore in the Marshall Bonanza, varying in thickness from 2 to 4 ft, has been made, and large quantities of this fine mineral is now being taken out and shipped to St. Louis for treatment. Mayor Sisson of Valleceitas reports a 3-ft strike in his Georgia, of carbonates, which are pronounced away up by experts from Colorado. In the Capital and Bonanza No. 3 very rich strikes of large dimensions have been made. Also in the Bodine Dollar or Old Santa Rosa. In this property the vein is 7 ft in width, and from wall to wall is a mess of galena running in coursee of from 7 to 18 inches in thickness. On the Nick of Time, 2 shefts are to be commenced at once and continue sinking until water is reached. A level will be run and machiuery planted. This property has been placed in the hands of a company of Davenport, Iowa, capitalists, backed by $20,000,000, who propose to make things hum. Three thousand dollar ore is now being taken from the Cnsh Entry, and the proprietor justly feels elated over the rich prospects in store for him. Machinery is now on the ground for Bonanza No. 3 and is being p aced in position, when ore will be taken from this shalt which will astonish the natives. The Duryee smelter is a fraud nnd compares with a smelter about as much as it does with a gristmill, and nay attempt to plant one in the Territory should be met with contempt. At Las Cerrillos the smelter will soon be in operation and ready to receive ore. They complain that a sufficient quentity of ore cannot be had. Let them commence work and they will find more ore thau they can handle with their present capacity will be produced on short notice. The largest nssay yet obteined in this district is from the Mexican Prince, containing free gold and is $155,240 36. This is way up, and shows that, though it may he very high, ore enough can be obteined to pay for working and leave a handsome profit.

OREGON.

WINTER.—*Democratic Times*, Nov. 25: The prevailing cold snap has put an end to mining operations for the present. Piping has been suspended at the Sterling mine, water having become scarce again. A great deal of mining will be done this winter, should there be an abundance of water. Miners in Josephine county, as well as in this, are busily engaged in preparing for the winter campaign. Jesse Dodge, of Willow Springs precinct, will try his luck in some diggings near his residence this winter. J. H. Williams, lately of Sterlingville, has moved to Farmer's flat, where he will look after August Wulf's mining interests. T. H. Fielder & Sons, of Evans creek, have purchased mining ground of J. M. Kendrick, on Jackson creek, and will take possession at once. W. A. Johnson, the well-known quartz miner, is still engaged in going down on the Jewett ledge. He crushed a few tons of quartz recently with an arastra, which yielded rather favorably. R. M. Caine, who has been employed on the Squaw Lake Co's mines on Big Applegate, came to town Wednesday. From him we learn that water has been turned into the ditch, but that no work is being done as yet, owing to the extremely cold weather. W. H. Benner, of the Centennial mine, in Willow Springs precinct, informs us that everything is in readiness there for winter, and that one day's piping was done before the cold snap interfered. He says it is doubtful whether the mines in Dodge's field will be operated extensively this winter.

UTAH.

NOTES.—Silver Reef *Miner*, Nov. 10: A visit to the mines by our reporter found the usual activity all along the line. At no time during the history of the camp has the business shown to better advantage than now. Both mines and mills are showing well, under thorough and systematic management.

THE STORMONT CO.—As the fourth south level from the Savage shaft has advanced the ore has improved very considerably, and now shows a paying 4-ft vein of characteristic Buckeye ore in the face. This is considered of more than ordinary importance, from the fact that the same character of ore was encountered above, and in each of which the grade improved with depth.

THE CHRISTY CO.—In the California the ore bodies are all showing well, especially in the third nnd fourth levels north, in which splendid developments have recently been made. At the Maggie nnd Silver Flat work continues with the usual flattering results. Taking the company's property all in all, it never looked or yielded better than at present.

THE BARBEE AND WALKER.—The late strike of ore in the winze driven from the fourth north level has steadily improved, and is yielding handsomely. The main incline is being driven down with 8-hour shifts, and will be sunk 100 ft from the present station. The mine throughout is looking well.

THE LEEDS.—The ore from the Bonanza shaft is proving of much better grade than that previously taken from the east incline, and will help to increase the mill product very considerably.

THE GOLD BASIN MILL.—The experimental ten days' run of Messrs. Davis, Ridenour & Co.'s 5-stamp mill at Gold Basin cleaned up $2,052 94 from 60 tons of ore from the Patterson mine. Everything is reported running smoothly, and a continuous product may be looked for from this source in future.

A. S. BIGELOW, of Columbia Hill, Has been appointed superintendent of the Eureka Lake and Yuba Canal Co.'s properties in Nevada county, to succeed Robt. McMurray, the former efficient manager, who recently resigned.

The Upper Kern—The Kaweah Group.

[Written for the PRESS by J. W. A. WRIGHT.]

The sketcb accompanying your late engraving of "Mt. Whitney as seen from Mt. Young" baving been writtsn in our rough and exposed monntain camp in Whitney canyon, nsar ths western base of our great mountain, was nscessarily condsnsed. As it was not certain that the engraving could he msde, no explanation was given ahout the Mt. Young, from whicb the view was taken, and other points requircd to properly understand it. Witb your consnt euch explanation will now be given, togetber with other facts collected by our exploring expedition during the three weeks we spent in the almost unknown and very elevated and curious regions of the Upper Kern, its varions tributaries, and its numerous lofty and precipitous divides. Some iteme will also he recorded ahout the grand Kaweah Buttes and the ascent, perhaps for the first time, of

Mt. Kaweah,

The taking of its altitude and the approximate hights of adjacent and previously unnamed peaks in the same unexplored group. Our thanks are due the proprietore of the PRESS for the engraving prepared to accompany this sketch, and accurately representing Mts. Kaweah, Henry and Ahert, as seen from our camp some four milee south from the summit of the former and at an elevation ahove sea level of about 10,400 ft. This and the engraving of Mt. Whitney were both from pencil drawings made under great disadvantagss by the Rev. F. H. Walee, of Tulare City, who was one of our party of three. Thougb plain, they have the merit of giving accurately, for the first time, the appearance of these noted mountains from the nearest and best points of view accessihle. Now, wbere ie Mt. Young, from wbose summit the view of Mt. Whitney was taken? The only route hy which Mt. Whitney is at present accessihle for pack animale ie hy the regular trail from the southwest. This first reaches

Whitney Creek,

In a large *cienega*, or marshy meadow, at least five miles southwest of the eummit of Mt. Whitney, and here the first view of the mountain is obtained hy tbis route. You follow up the creek througb its deep canyon, tbe heavily timbered ridges, and afterwards tbe bare gray granite ridges, rapidly rising higber and bigher on each side, until, a mile or two heyond, yon pass tne lower of four small clear lakes and come to a grassy meadow, witb a half dozen large tamaracks or backmatacks at the point of entrance. Here, as tbe short, "cnrly" grass peculiar to our Alpine meadows was abundant, and there was plenty of wood, we had our camp from Septemher 3d to 8th. The view of this part of the canyon, looking eastward, is exceedingly picturesque and grand, closed entirely at its upper end, as it is, by the bare, craggy precipices of Whitney's immense granite masses, two miles distant, perhaps, in a straight linc. On eacb side of the entrance of tbis rockiest, wildest, and most glacier-worn part of the canyon, is a long, hare granite ridge, each terminating in a high isolated peak. At the suggestion of Mr. Wales, our party agreed to name the one on the soutb side

Mt. Hitchcock,

In bonor of Prof. Charles Hitcbcock, the well-known geologist of Dartmouth, where Mr. Wales spsnt bis college days, and that on the north Mt. Young, after our distinguished astronomer, formerly of Dartmouth, now of Princeton. The day before we left camp Whitney, to pursue our almost trackless route to the sources of the main Kern, Mr. Wales, witb our instruments, made the ascent of Mt. Young, found its altitude to he approximately 13,600 ft., huilt a monument five ft. high, and left in it the record of the naming of tbe two mountains. At 1:30 P. M., be found the temperature was 48° in shade, and 66° in sun; and our aneroid read 18.60. We may as well record in this connection, that the day before (Sept. 6th), at 12:45 P. M., on the summit of Mt. Whitney, the eame instruments indicated as follows: Barometer, 17.60; tbermometer 42° in sbade. Also, in our camp Whitney at midnight, Sept. 7th, our harometer stood 20.30, and thermometer 38°. The water of Whitney creek, clear and pure as csn be, varied in temperature at night from 36° to 40°, and some mornings thin ics was formed alongits edges. Between 1 and 2 P. M., Sept. 7th, its water was 46°, with the atmosphere at 60°, and your correspondent enjoyed the luxury of an air bath and

A Plunge Bath

In that calm, sunny atmosphere, and in the rushing waters of that icy mountain stream. If any of yonr rsaders don't think that watcr felt cold enough for this to be fairly termsd an Arctic hath, or don't hslieve that our party found considerahle gennine "red snow" at several points, from 10,500 to 12,500 ft. in altitude, I only wish I had had him there to "dnck" him. That is all. He would prohably have heen convinced then.

This heautiful stream that is fed by the psrsnnial smow mssses and lakes along Mt. Whitney's western, northwestern and southern slopss, ran —from 10 to 15 ft. wide, and 2 to 3 ft. deep—within 20 steps of our picturesqne camp, and, rushing in many a rapid and cascade in a southwesterly course, empties into the main Kern, not very far above where the "Fourth Standard Line South" intersects it—possibly two or three miles. In this and other etreams, at great altitudes, we not only

Found no Fish,

But the only living things we saw in them and the higher lakes were frogs, tad-poles and the uhiquitous and curious water insect called the *Notonecta* or "water-hoatman."

This insect, a spscies of water heetle, is really amphihious. Hence, no doubt, ite ahility to reach these high altitudes. It is the insect which, while in the water, ewims on its hack, and from this gets its syetematic name, *notonecta*, meaning literally hack-swimmer. By means of a buhhle of air, whicb nature enables it to form, it frequently rises to the surface, thence quickly darts to the hottom again, using its feather-like legs for oars. Take it from the water and dry it in the sun, and it soon epreade its wings like any beetle and flies away, generally to the water. Handle it with great care, if at all, for tbougb it bas no eting, it has a sharp peak or snout with wbich it can easily pierce the hand. Thie it is sure to do, if you give it a fair chance, and you will imagine youreelf etung. In fact, you migbt as well he. Yet the puncture ie not poisonous. I bere describe this insect that your readers may recognizs it, and may at some time examine it, for it ahounds in our springs, streams and ponds, at almost all altitudes, as our late mountain trip proved. Strange ae it may seem, tbis is one of the many insects wbicb in San Joaquin valley and otber parts of California, flits around our lamps and candles on summer eveninge, leaving its watery home for its excursions hy nigbt. In future, I shall hope to record in your columns more ahout

The Animal and Vegetable Forms

Fonnd in the bigb Sierras of Tulare county. We have specimene of all tbe higher flora of tbese regione for fnture use. Of all insects found in our alpine regione the most interesting and nseful is the "ealmon fly" and its larva. It helongs to the kingdom of tbe dragon fly. Its grnb and the perfect fly are the very best bait for the "golden trout." In July and Angust these grubs are found nnder and adhering to rocks and logs, in the edges of streams and lakes, or crawling on the hottom in shallow water and dragging witb them their long, flat, sand-covered cases or cocoons. During the first two weeks in September the gruhs are transformed to tbe perfect insect. While we were camped on tbe main Kern, at altitudes between 8,000 and 9,000 ft., tbese "ealmon flies" darted around our camp fires at night in large nnmhers, and we found them and "hlue-tail flies" about as good trout bait as tbeir larvæ or grubs. Wherever trout abound these do. We found them in streams at bights of 10,500 ft., the highest points wbere we caugbt

The Golden Trout

Being abont 9,500 ft. in altitude. It is to be hoped that all these higher streams and lakes above falls and cascades impassable for fish will some day he stocked with these splendid trout, just as the two "Monarcb lakes" in Monarch canyon, of tbe Mineral King district, have heen stocked tbis summer by private enterprise. Tbe altitude of Lower Monarcb lake is 10,500 ft.; the upper one, 10,800 ft. On the 21st of September tbe 200 trout put in tbsm about a month hefore by Messrs. Lavells, Ward and Wren were doing well.

Befors we tske your readsrs to Mt. Kaweah, we must tell of two more conspicuous mountains to which our exploring party gave names, hsfore ws reached Whitney canyon. The night hefore our arrival there we camped ahout 10-, 500 ft. ahove ssa level, in Loomis' canyon on Loomis' creek, so named from ons of the first men who took sheep that bigh up in these mountains. Meeting there Mr. D. Durward, of Kern county, with his sheep, we eoon learned that we were surrounded by bold mountain peaks, nameless and hut little known. Next morning after a tedious and difficult ascent of some 1,500 ft. in a distance of ahout two miles, we found ourselvee in a high, well wooded pass at an elevation of nearly 12,000 ft., witb a commanding view in every direction. West of us wae a bare pyramidal granite peak, and to the eastward a long higb ridge and peak. By my special request these were named.

Mts. Guyot and Agassiz,

Mt. Guyot to the westward. We also called this gap Guyot pass, in honor of our emiuent geographer and geologist, whose instructive lecturee at Princeton, New Jersey, will ever bs among my pleasantest recollections of early life. We all thought it suitable that the honored names of Agassiz and Guyot, who were hosom friends at Neufchatel and elsewhere in Switzerland, should he closely associated among our higher Sierras, as they have so long been in the achievements of modern ecience. Mr. Wm. B. Wallace, our guide and friend, and an expert in mountain climhing, made the ascent of Mt. Guyot for me, took its bight, erected a monument, and left a record of tbe new names. At noon the temperature on tbe summit was, in the shade, 43°, in the sun, 49°, and the altitude about 13,500 ft. There were large snow patches (Septemher 3d) on the north and east slope of Mt. Guyot and on the western slope of Mt. Agassiz. During the ascent Mr. Wallace saw msny traces of the

Big Horn, or Mountain Sheep,

And we fonnd them afterwards on other higb points, including Miner's peak, near Mineral King, but never once could we get a sight of these shy and cnnning denizens of our bighest mountains. It may be well to mention here that Mr. Wales found some red snow on one of the ridges of Mt. Young. He learned also, from conversation witb an Indian from Lone Pine, who was in Capt. Michaelie' camp, that he had found red snow while coming np Lone Pine canyon to Mt. Whitney. Our party afterwarde found it in large quantities at a hight of 12,000 ft., near the head of Jenny Lind canyon, just north of the Kaweab group of peaks.

But how did we reacb

Mt. Kaweah,

And succeed in making tbe ascent, which has long been deemed so difficult, and hy some, almost impossihle? From Camp Whitney we traveled with our seven animals—two of them well packed—for at least 30 miles before we hegan to ascend towards tbe vast and heavily timbered table-land from which the Kaweab group of mountains rises like so many isolated buttes. To hs hrief, onr stages were ae follows, over the rongheet route imaginable, and without any trail at all most of the distance: To Moraine camp seven miles, general direction northweet, elevation 11,400 ft., crossed large eastern brancb of Kern river, whicb we call Moraine creek; altitude of the ford 10,800 ft. To Milestone camp, just east of Milestone mountain, five miles, altitude 11,400 ft. This was about three miles helow the extreme sourcee of the main Kern; crossed another large eastern hranch of the Kern, at hight of 11,200 ft., call it Tyndall creek. This was our farthest point north, and was near the base of the precipitous divide bstween Kern and Kings river. From tbis camp Mr. Wales ascended tbe divide and made an ohservation of the upper Kings rivsr region. Thence we went due soutb down the

Canyon of the Main Kern

To Junction camp eight miles, altituds 8,400 ft.; thencs south to Fern camp, just above ths junction of Crabtres creek with the main Kern, 10 miles, altitude about 6,800 ft. At Milsstons camp and as we passed down ths upper part of Kern canyon—one of the deepsst, longest, and grandest gorges of the Sierra Nsvada—we had a fine view of Mt. Guyot, which was nearly due eonth of us, and is a very prominent landmark for all that region. Up to this point we had heen eo fortunate as to find grass enough at each camping spot for our faithful animals. At the latter camp, however, in a dense forest, the only one we ventured to reach after dark, there was nothing hut ferns in the way of horse fesd, and of these they eat sparingly as you may snppose. The thought often occurred to us, on this long muscle-testing and lung-testing mountain journey, when our horses, panting and jaded, had at different times taken us to hights of 10,000, 11,000, 12,000 and even 12,500 ft., tbat the faithful hrutes were as near horse-heaven as they would ever he; hut you may rest assured, after that night'e experience on ferns, they looked next morning a good deal as if they thought they had heen in

The Infernal Regions.

When informed that in the next 10 miles from Fern camp to the eummit of Mt. Kaweah we had to climh at least 7,200 ft. in altitude, you can understand that it was one of the toughest and moet trying parts of our mountain experience, and that we found it necsssary to travel hut a ehort distance eacb day.

MTS. KAWEAH, HENRY AND ABERT LOOKING NORTHWARD FROM HIGH TABLE LAND.

Sept. 14th, we went northweet and ascended a very steep trail 1,800 ft. to Island camp, a pretty grassy spot, on tbe lower one of four small streams, which, dashing over the very high, perpendicular western wall of Kern canyon, form some of the bighest, if not the very highest waterfalls in California, or, indeed, in the world. Having an opportunity to take the altitude of the fall from this first stream, hy baving our aneroid at tbe hase and afterwards at the point where the wild watsre leap over the bluff into the canyons, we found it was 1,500 ft. The bighest fall, eome distance ahove this, whicb we named, at Mr. Wallace'e euggestion

Sha-goo-nah Falls,

From the Indian name of Mount Williamson, must be in its entire descent, at least 3,000 ft. high. Even so late ae Septemher 13th, it was a grand and heautiful waterfall, and the towering cliffs on each side of it were very much like El Capitan, in Yosemite valley. By a ride of three miles September 15th, we ascended 1,800 ft. more, and camped at the point from which the

View of Mt. Kaweah

Here given, was sketched by Mr. Wa'es. Hsre we pitched our tent, for tbe second time on the trip, and called it Camp Kaweah, altitude, 10,400 ft. There ie hut one route known or prohahle for a pack train over the great western wall of Kern canyon to thie point, and but one westward to the deep and picturesqne gorge known as Jenny Lind canyon, through which runs Crahtree creek, the chief western tributary of the Main Kern, nortb of the Little Kern river. Tbese passee lie near tbe fourth standard line south of the United States Surveys, the only Governmsnt line that bas ever yet heen surveyed througb that country, and it runs only to the western verge of Ksrn canyon. Our camp, in the edge of a tamarack or backmatack forest, just soutb of Mt. Kaweah, was near this line.

At 9 A. M., September 16th, after a solid monntain breakfast, onr party etarted, well mounted, provided with onr instruments, lunch and a canteen of water,

The Ascent of Mt. Kaweah

By a route we had partly traced tbe afternoon hefore. The temperature at 10 P. M. the 15th was 34°; at 6:30 A. M. the 16th was 38°, whils the water in the purling, limped hrook ncar our camp was 43° By noon we had passed through the dense forest that skirts all the southern hase of tbis grand old mountain to an altitude of nearly 12,000 ft., had ridden over the rocky debris up, up, up above the last etunted *pinus contorta*, and tethered our horses to the rocks in what we called "Quartz Nich," hecanse of quantities of glassy, harren quartz found there, some of it smoky quartz. The elevation bere was 12,500 ft., tbe highest point to wbich we rode our horses at any time on the excursion. As there was a southern exposnre, the temperature was very pleasant—72° in the shade. At 3 P. M., after climhing over at least a mile of the roughest rocks, the top of the lowest peak was reached. Its hight was found to be not far from 13,550 ft. Temperatnre in

sbade, 60°. Between this and ths highest poiut a peculiar snow patch was fonnd like ono near ths summit of Mt. Whitney. Wo could think of no morc descriptive nams for it thsn

Serrated Snow.

Thc plsces named are ths only two whero we ever saw anything like it. It is similar to soms of tbe npper surfaces of tbe glacial forniations of ths Alps, as repressuted by engraviugs. Tho whole surfacs, of the most dazzling whitencss, stands up in small cones from threc to six ft. high, like miniaturs Sierra. Unlike other snow, it had ths appearancs of hnge skeins of satin floss drawn to a point. Yet thoro was no otber semblance to a glacial formation, nor did we discover auything like a living glacier on this journey of fully 200 miles in our highest and most unfrequented Sierra, and in some of their most insccessibls gorges, vast fields of granite, thoroughly polished by glacial action in tbs remots past, wsre found in Whitney canyon, at the head of Jenny Lind canyon, just north of Mt. Abert, and afterwards at the bsad of Monarcb cânyon, in the Mineral King district, on ths southern elops of Miner'e peak.

At 4:40 P. M., our party had the satisfaction to bs united

On the Summit of Mt. Kaweah.

We found not ths slightest evidencs that any human being bad ever been there before us. Friends Wallace and Wales built a neat monument about four ft. high, and in a small tin case we left a record of the ascent. Our barometsr stood at 18.225 or about 800 ft. less than it indicated on ths summit of Whitney. Hsnce, to call the altitude 14,000 ft. cannot bs far wrong, yet 14,200 ft. may not be too much. The high reddish cons in tbe group about two miles northwest of Mt. Kaweah we found by carsful levcling is perhaps 100 ft. higher than Kawsah itself. We named it in honor of Prof. Joseph Henry, eo long in cbarge of the Smithsonian Institute. The similar dark peak about a mils farther northwsst, and tbs extrems northern peak of the Kaweah group, wo named for Col. J. J. Abert, who, as one of the earliest graduates of West Point, was for mors tban 30 years cbief of ths Topographical Engineers U. S. A., and under whose direction Fremont made his first noted expeditiou to this coast. We bops

Mts. Henry and Abert.

Will be permansntly known by tbese worthy names. Mt. Abert is sligbtly lower than Kaweah; perbaps 50 or 100 ft. From the Tulare and Fresno county plains tbese are the tbree highest, barest points seen in the clear days of winter; Mt. Abert the cone farthest nortb, Mt. Henry, tbe cone next to the south, and Mt. Kaweab, tbe long doms just south of tbem. The perspective in tbe accompanying engraving from a point nearly 4,000 ft. below tbeir summits, makee Mt. Abert, to tbs left, and Mt. Henry, in tbe middle, look much lower tban Kaweah's great mass, which is nearest to tho point of view. But a sids viaw from sast or west makes the tbree appear of about ths same bigbt.

Want of space forbids an attempt to dsscribe tbe magnificent array of our bighest mountains that surround Mt. Kaweah's grand old doms. The latter is about the center of a great circle of ridges and peaks, whose radius is about 10 miles. About a dozen line lakes were in sigbt, one of which, a mile south of our camp, and formerly visited by Mr. Wallace, covers at least 160 acres.

We will closs this sketch with tbe meaning of the Indian name Kaweah, which I bad the pleasure to learn from Mr. Joe Palmer, a noted mountaineer. Tho true word is Kah-wab, accented on the last syllable. Its literal meaning is "I sit bere," or, more freely rendered, "Here I rest" or "Here I dwell."

New Mines.—We learn from Cerro Gordo thst John H. Ely and party have returned from tbsir prospecting trip, bringing with tbem a large number of samples of very rich silver ores. The new district is said to he about 80 miles east of Cerro Gordo. Mr. Ely claims that thers are millions of ore lying around loose, of the ssme quality as the ssmples brought in. A team can be driven on to the mines, water is plenty, but wood is ratber scarce. Tbs orss are mostly rich chlorides and born silver. A number of samples bave been forwarded to the Independence assay office, and in appearance, some of them would certainly deceive the oldest rock sharp in the country. Two of them in particular closely resemble a soft, grsyisb limsstone, that if not found in a mineral vein, a prospector would not notics. These two samples assay $416.12 and $475.25 per ton in silver. Four other samples aesay respectively $1,112.42, $927.64, $682.56 and $128 silver. The discoverers will proceed at once to organize a district and prospect their claims.—*Inyo Independent.*

Illustrating Mines.—At a meeting of tbe Engineers' Club in Philadelpbia the other day, Chas. A. Asbburner exhibited and dscribed two maps of tbat part of tbe coal rgions of Pennsylvania from Mabsnoy City to Shenandoak. Ons was made in the old style and tbe other in the newly adopted plan of illustrating the mines—not by vsrtical cross-sections, but by 50-ft. underground contours showing the limits of the beds in place and to great perfection. Tbe probabls outline of undeveloped portions can thus bs very satisfactorily determined.

The duty on bullion, heretofore taxed on being taken out of Mexico bas been annulled. So saye tbe Mexican Consnl at Tucson.

Useful Information.

How to Mix Paints.

Tho following table will bs found very serviceable to msny, especially to *amateurs*, as showing the msnner of mixing the simple colors to produce compouud colors:—To make a

Buff—Mix white, yellow ocher and red.
Chestnut—Red, black and yellow.
Chocolate—Raw umber, red and black.
Claret—Red, umber and black.
Copper—Red, yellow and black.
Dove—White, vermillion, blue and yellow.
Drab—White, yellow ocher, red and black.
Fawn—Whits, yellow and red.
Flesh—White, yellow ocher and vermillion.
Freestone—Red, black, yellow ocber and white.
French Gray—White, Prussian bluo and lske.
Gray—White lead and black.
Gold—White, stons ocbsr and red.
Green Bronze—Chroms green, black and yellow.
Green Pea—Wbite and chrome green.
Lemon—White and chrome yellow.
Limestone—White, yellow ocber, black and red.
Olive—Yellow, blus, blsck and wbite.
Orange—Yellow and red.
Peach—Wbits and vermillion.
Pearl—White, black and blue.
Pink—White, vermillion and lake.
Purple—Violst, with more red and white.
Rose—Whits and maddor lake.
Sandstone—Whits, yellow ocber, black and red.
Snuff—Yellow and Vandyke brown.
Violet—Red, blus and white.

In tbe combinations of colors required to producs a desired tint, tbe first named color is always the principal ingredient, and ths others follow in the order of their importance. Tbns, in mixing a limestone tint, wbite is tbe principal ingredient, and red the color of which the least is needed. The exact proportions of each color must he determined by experiment with a small quantity. It is best to havo tbe principal ingredient thick, and add to it tbe otber psints tbinner.

A New Method of Inlaying Wood.—A new metbod of inlaying wood has been contrived by a furniturs manufacturing bouse in England. The process is as follows: A veneer of ths same wood as that of wbich the design to be inlaid consists—say sycamore—is glued entirsly over ths aurface of any hard wood, such as American walnut, and allowed to dry thoroughly. The design is then cut out of a zinc plate ahout 1-20tb of sn inch in tbickness, and placed upon tbo vencer. The whole is now subjected to action of steam, and msde to travsl between two powerful cast-iron rollers of 8 inchss in diameter by 2 ft. long, 2 above and 2 below, which may be brought witbin any distancs of eacb otber by screws. The enormous prssure to wbich the zinc plate is subjected forces it completely into tbe veneer, and tbe veneer into the solid wood beneath it, whils the zinc curls up out of the matrix it has thus formed and comes away easily. All that now remains to hs dons is to plane down tbe veneer left untoucbed by the zinc, until a thin shaving is taken off tbs portion forced in the walnut, when the surface, being perfectly smooth, the operation will hs completed. It might he supposed that the result of this forcibls compression of the two woods would leave a ragged edgs, but this is not the case, the joint being so singularly perfect as to be unappreciable to the touch; indeed, the inlaid wood fits more accurately than by the process of fitting, matcbing, and filling up witb glue, as is practiced in tbe ordinary mode of inlaying.

How to Tell Good from Bad Gilding.—It may be ascertained whether gilding is genuins or not by ths fact that on the latter a weak solution of protocbloride of copper produces a black precipitate, which it does not on tbs former. In ths cass of gilt paper, the simplest method consists in slowly burning the paper in a bright flsme tbat gives out no smoke; in tbs incinerated remains of good gilt psper there ars traces of tbe gold left behind, wbich are quits perceptible to ths naked eye, in the shape of glittering spots, while base metal on paper oxidizes in burning, and leaves nothing hut a lot of red spots behind. This method, bowever, is scarcely accurate enough; a very much safer test is to be found in the use of mercury, either in metallic sbape or in solution of salts of mercury. The former test is performed by putting a few drops of purs quicksilver on the gilt article, and either rubbing it in or slightly beating it. If the gilding be genuine, though ever so thin, tbe mercury combines itself with it, producing wbite spots on ths surface. This does not occur in the case of sham gilding, and in rubbing mercury no change of color whatever can he noticed. Another test consiste in the application of a watery solution of nitrate of mercury. In this cass tbe exact opposite takes plac as in tbe former, for genuine gilding remains intact, wbile a "duffer" at once takes a whits color wbsn brought in contact witb ths precipitats of mercury.

Dogs in a state of natnre never bark; they whine or growl. The explosive noise is only found among tbose wbich have been domesticated,

Luminous Paint.

Ths London *Building News* says: The comparatively recent discovery that luminous paint can bs applied as ordinary wbitewash, considerably expands the field of its usefulness. Sheets of glass coated witb tbs paint form Alladin's lamps, which are in use in soms of tbs vessels of the navy, at the Waltham Powder Factory, at Young's Paraffine Works, and in the spirit vaults of several docks; but now that, hy increased production and the use of water as tho medium, the cost is reduced by ons-balf, it will probably be extensivsly used for painting walls and ceilings. The ordinary form of oil paint has already hsen applied in many ways to clock-faces, to name-plates and numbers and house doors, and to notice boards, such as "mind the step," "to let," etc. The paint emits light without combustion, and, therefore, does not vitiats tbe atmospbere. Several experimental carriages are now running on different railways, the psint being used instead of lamps, wbich are neccssary all day on account of tbs line passing through occasional tunnels. It is reported that a paper at Turin called *Light* is to appear sbortly, printed in ink which will bs luminous when darkness sets in. Who can say, indeed, tbat a policsman, when smeared in this luminous composition, will not bs somstimes visible on bis heat at nigbt?

How to Make a Luminous Paint.

The following method of procedure will, it is said, give a very satisfactory luminous paint: Take a number of oyster shells cleaned from organic matter as thoroughly as possible, and burn them in a strong coal fire for about balf an hour, at the end of which time take them out and allow to cool. When quits cold, pound them fine, removing, during this operation, any particles of grny matter that may show themselves, as tbess are nssless. When finely powdered, maks an intimate mixturs of tbis witb flowers of sulpbur. Introdnce tbe mixture into a crucibls, luting on a lid to the vessel with clay, or other conveuient luting material. When this is dried, place ths crucible in tbe fire and allow it to remain for an bour; tben remove, and allow to cool befors opsning. The mixture then should appear purs wbits. Any gray particles that havs escaped removal at the first preparation, sbould bs removed now. The resulting powder sbould bs mixed with gum water to a thin paint, as two tbin applications are bettsr tbsn one thick one. Tbis paint will remain luminous far into the nigbt, provided it is exposed to the ligbt during the day.

Good Health.

Effects of Smoking on the Heart.

Ws have often observed cases of intermittsnt pulse in wbicb the cause was unquestionably the use of tobacco, the difficulty disappearing in almost every case where the habit was abandoned. The *Sanitary News*, under the head of "Danger Signals," presents ths following interesting facts on this subject:

"Soms years ago, M. Decaisns drew attention to ths fact that tobacco smoking often causee an intermittent pulse. Out of 81 great smokers examined, 23 presented an intsrmittent pulse, independent of any cardiac lesion. Thie intermittency disappeared when ths habit of smoking was absndoned. He also studied tbs effects of smoking on children from 9 to 15 years of ags, and found that it undouhtedly caused palpitation, intermittent pulse and chloroanæmia. Tbs children, furtbermore, became dull, lazy and predisposed to tho use of alcoholic drinks. Recently be reportsd to the *Societe d'hygiene* (*Gazette Obstetricale*) ths results of his observations on the effects of smoking on women. Since 1865 he bas met with and observed 43 female smokers. Most of them suffer from disturbances of menstruation and digestion, and eigbt presented very marked intermittency of the pulse without any lesion of the beart. Hs gave detailed accounts of thess eight cases, in which all treatment directed against tbe intermittency proved utterly useless, while tbe supprcssion of tobacco was invariably followed by improvement, and very often by complets disappearances of the phenomenon."

Sand Bag for the Sick-Room.—Ons of tbe most convenient articlee to bs used in a sick-room is a sand bag. Get some clean, find sand, dry it thoroughly in a kettle on the stove; make a bag, about eight inches square, of flannel, fill it with the dry sand, sew the opening carefully together, and cover the bsg witb cotton or linen. This will prevent ths ssnd from sifting out, snd will also enable you to beat ths bag quickly by placing it in the oven, or even on top of the stove. After ones using this you will never again attempt to warm the fset or hands of a sick person with a bottle of hot water or a brick. The sand holds tbe heat a long time, and the hsg can bs tucked up to tbe back without hurting tbs invalid. It is a good plan to make two or three of ths bags and keep them on hand, ready for use at any time when needed. —*Herald of Health.*

How to Take Tincture of Iron.—To disguise the taete of tincture of iron: Dr. Haner recommends that tincture of tbe sesqnicbloride of iron be mixed witb simple syrup and then with milk. This mixture will not affect tbe teeth, nor will the styptic taste be apparent.

Eating Before Sleeping.

The Old Time Rule Reversed by an Advocate of Late Suppers.

Man is ths only animal that can bs taught to sleep quietly on an empty stomach. The brute creation resent all efforts to coax tbem to such a violation of tbs laws of nature. Tbe lion roars in ths forest until he has found his prey, and when he has dsvonred it hs slseps over until he needs another meal. Tbs horse will paw all nigbt in the stable and tbe pig will squeal in ths psn, refusing all rest or sleep until they are fed. The animals wbich cbew the cud bave their own provision for a late meal just bsfore dropping off to their nightly slumbers.

Man can train bimself to the babit of sleeping witbout a preceding meal, but only after long years of practice. As bs comes into the world nature is too strong for bim, and he must bs fed bsfore he will sleep. A cbild's stomacb is small, and when perfsctly filled, if no sickness disturbs it, slesp follows naturally and inevitably. As digestion goes on the stomach bsgins to empty. A singls fold in it will make the little slesper restless; two will waken it; and if it is husbed again to repose the nap is sbort, and tbres folds put an end to tbe slumber. Paregoric or otber narcotic may closs its syes again, bnt without food or some stupifying drug it will not slesp, no matter how bsaltby it may bs. Not even an angsl wbo learned tbs act of minstrelsy in a celsstial cboir csn sing a babs to sleep npon an empty stomacb.

We use the oft-quoted illustration, "sleeping as swestly as an infant," becsuss this slumber of a cbild follows immsdiatsly after its stomach is completely filled with wholesome food. Tbe sleep wbich comes to adults long bours after partaking of food, and wben the stomacb is nearly or quite empty, is not after the type of infantile rspose. There is all ths differsnce in the world bstween tbe slsep of refreshment and the sleep of exbaustion.

To sleep well ths blood tbat swells tbe veins in ths head during our busy bours must flow back, leaving a greatly diminisbed volume bshind tbe brow that latsly throbbed with such vehemencs. To digest well, this blood is nsded at the stomacb, and nearer the fountains of life. It is a fact establisbed bsyond tbe possibility of contradiction that slsep aids this digsstion, and that tbe process of digestion is conductive to refreshing sleep. It needs no argument to convince us of this mutual rslation. Tbs drowsiness which always follows the well-ordsrsd meal is itself a testimony of naturs to this inter-dependencs.—*New York Journal of Commerce.*

A Barbarous Entertainment.—The municipal authorities of Brussels ought to bs ashamed of tbemselves; a great fair is held in Brussels every year, at which, amongst othsr things, a silken dress is given by the city "to the woman wbo imbibes the largsst quantity of bot coffee in the shortsst time, and at tbe bighest temperature." No ons objects to ths authorities of Brussels providing amusement for their citizens. But surely soms sort of entertainment could have been thougbt of wbich would not bs positively injurious to those who take part in msking tbe fun. To drink a largs quantity of coffee at one tims is sure to barm one's health mors or less. How mucb more hurtful must it he to drink it at "the highest degree of temperature" possible. Surely, onr Old World friends have not yet lost ths barbarity of feeling wbich causes one man to delight in seeing anotber burt—wbich ie never happier than when gloating over anotber's pain.

Is a Rabbit Bite Poisonous?—The Castle Rock (Col.) *Journal* is responsible for ths following: "A man hy the name of Otis, living on Horse creak, was latsly bittsn by a rabbit, from the effects of whicb he almost lost his life. Hs was trying to catch ths rabbit for his little boy when the animal bit him on the tbumb; but be took little notics of it at tbs time. Ahout an hour afterward bis thumb began to pain him ssversly and swelled rapidly, so tbat he sent for a physician, who tbought be bad been bittsn by a rattlesnake. Tbs doctor at first could not bslieve it was the bits of a rabbit tbat caused tbs trouhlc; so, to fully satisfy bimself, he had several rabbits caught, with which he experimented. He found that tbe upper jaw contained a bollow tooth, from which he extracted a very poisonous fluid. He ascertained that two drops of this fluid administered to a lamb would kill it in lsss thsn an bour."

Cure for Snake Bites.—A discovery of great value to all parts of the world where venomous reptiles are common, and especially in tbe tropics, whsre thsy ahound, has hesn mads by Dr. J. B. Lacerda, sub-Director of tbs Laboratory of Experimental Physiology in the National Museum of Rio Janeiro, which will lead to their more general application. This ingenious scientist has proved that a solution of permanganate of potassium injected into ths blood is an infallible curs for snake bites. The remedy may he nsed as a simple snd availahls antidote not only for tbe bites of snakes, but for those of scorpions and tarantulas. Tbs experiments which led to tbe discovery were made upon dogs. An injection of a solution of ons part of permanganats of potash in 100 parts of water into the veins of the animals entirely removed the effects of strong doses of poison previously injected.

The new refinery of the Carson Mint is in full opsration and working to a charm.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:
Saturday Morning, Dec. 3, 1881

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Passing Events.

The now noted Gold Run case involving the debris question is still going on at Sacramento, but so far very little evidence has been brought forward except that tending to show the difference between the river beds now and what they were before hydraulic mining began. The testimony is very voluminous, which prevents our publishing it, but it may be found in the Sacramento papers.

December has been ushered in, here at least, by mild showery weather.

The time is at hand when claim owners, who have not already done so, should be taking steps to represent their claims. It no doubt has become somewhat monotonous with many to make the necessary outlay required from year to year without deriving any direct benefit, but the time surely will come when each and every mine that shows a mineral-bearing ledge will be found of value.

We intend on the 17th inst. to give a large double-sheet edition of the MINING AND SCIENTIFIC PRESS, devoted mainly to the interests of Arizona and New Mexico. This edition will be handsomely illustrated and will contain a large amount of original matter.

The snow on the mountains has driven in nearly all the prospectors in the mining regions, and they are now thinking over work done and laying plans for next season.

In California we will not show a very large figure of bullion product this year, owing to the cessation of work in hydraulic mines under injunction.

CAPT. J. G. RILEY, a mining man, formerly of this city, died in New York on the 15th ult.

Boundaries of Mining Claims.

In locating mining claims the law expressly states that the locator must mark his location by monuments, which will indicate to anyone its exterior boundaries. Fences are not required around mining claims. The physical marks upon and around the claim are sufficient to notify anyone of the claim of the possessor. Fencing would serve no useful purpose except to mark its boundaries; and any other means which will accomplish that object will equally answer the requirements of the law as to the possession of such a claim.

A claim of more than the number of feet allowed by law upon a quartz claim is void, for the excess, but setting stakes a few feet farther apart than the limit allowed by law, does not defeat the entire claim.

The object of the act of May 10, 1872, was to give to the discoverer his lode, with surface ground adjacent thereto, and within a certain distance on either side of that lode, and to avoid questions of vein identity; to give him in addition, all other veins within his surface location; but that if the vein originally discovered was not followed by a survey which included such vein, the surface ground allowed to the discovering vein and the side veins additionally granted, could not be construed to include the surface and the side veins within a lot of ground which did not contain the original vein first discovered.

Under the mining laws of the U. S., unaided by any supplementary miners' rules, there is no way of locating a quartz vein, except by marking out surface lines; and when these lines have been marked, they cannot be changed so as to take on ground that has been located by others, prior to such attempted change.

A location to a mining claim must be distinctly marked on the ground, so that its *boundaries* can be readily traced, but the law does not define or prescribe what kind of marks shall be made, or upon what part of the claim they shall be placed. Any marking of the ground claimed by stakes, mounds, or written notices, whereby the *boundaries* can be readily traced is sufficient if the center line of a location of a lode drawn lengthwise be marked by a prominent stake or monument, at each end thereof, upon one of which is placed a written notice, showing that a locator claims the length of said line upon the lode from stake to stake, and a specified number of feet or width on each side of said line, such location is so marked that the boundaries may be readily traced; and, so far as the marking of the location is concerned, is a sufficient compliance with the law.

The placing of a monument in the center of a mining claim upon a mineral vein and posting a notice thereon stating that "the undersigned claim 750 ft. easterly and 750 ft. westerly therefrom, together with 300 ft. on each side of the vein, with all its dips, spurs and angles," is *not* a sufficient compliance with the act of May 10, 1872, which requires locators of mining claims to distinctly mark their locations on the ground so that their boundaries can be easily traced.

The posting of a notice upon a tree at each end of a mining claim is not a sufficient compliance with the law requiring the location to be distinctly marked.

ABOUT MINING.—The Chicago *Mining News*, speaking of men talking about the business of mining, just as though it was something that had not occupied the attention of men from the remotest times, says: "This senseless stringing out by the mining press of long, tedious articles under the caption. 'Does Mining Pay,' or 'Is Mining a Legitimate Industry?' should cease. The day for this has passed away. Everybody knows that mining pays, and it has won its way as a legitimate industry when properly conducted, though it can be made illegitimate and profitless by criminal or careless management. More attention should be paid to the dissemination of mining news, letting the industry take care of itself. It would be thought the hight of absurdity to see in a commercial journal a string of words beaded. 'Is Commerce Legitimate?' But the very men who scout such an idea as this will fill a column or more with the very self-same stuff about mining."

GRAVEL DEPOSITS.—On Tuesday a long dispatch came from Washington and was published in the city dailies as the Director of the Mint's theory of the formation of gravel deposits. This "Theory" was written by the editor of this journal, and published in the MINING AND SCIENTIFIC PRESS some months ago. The Director of the Mint used it in his report and gave proper credit for it. It is amusing now to see the article published here where it appeared six months ago; when it had to go east, receive the "stamp" of a Government official, and be telegraphed back before it received recognition.

WM. CORBERT, a miner employed in the Wakeeshow Co.'s claim at Relief Hill, Nevada county, was killed recently by being caved on and then washed through a long flume. The force of the falling dirt precipitated him into the flume, and as there was a full head of water running, he was washed through it. Death probably resulted from drowning.

LEAD in Salt Lake is $48 per ton.

Recent Discoveries of Egyptian Relics.

Our readers are already acquainted with the fact of the recent remarkable discovery of a wonderful collection of ancient Egyptian relics in a cave near Thebes. The full particulars of this discovery have now come to hand. It appears that for eight or nine years past certain natives of a mountainous region near the ruins of ancient Thebes have been offering for sale to travelers and others numerous relics. The readiness with which they were bought up, so stimulated the trade that within a year or two the Egyptian authorities have come to the conclusion that there must be some secret deposit of such things known only to a few of the natives in question. Acting upon this presumption, and feeling that if there was such a deposit it should be placed under the control of the government, the authorities, last spring, employed the well-known scientist, Mr. Emel Brugsch, to go to Thebes and endeavor to find out the locality from whence these relics were derived. Having arrived, Mr. Brugsch soon succeeded in discovering the immediate neighborhood of the deposit, but was for some months baffled in discovering the exact locality. Circumstances finally pointed out a native who it was believed knew all about it. He was immediately arrested and called upon to divulge his secret. Of course he professed ignorance, but as assured was the government agent that he was given but six hours to tell all he knew under threats of severe punishment. At the expiration of the six hours, the native, still remaining obdurate, was cast into prison. The news of his arrest soon reached the ears of his brother, when this second individual came forward and promptly revealed the secret, and conducted Mr. Brugsch to the tomb or cave.

The locality, which is known as Der-el-Bahari, is among some low hills and rocky ravines upon the immediate border of the Theban plain. The place had evidently been entirely hewn out of the soft limestone rock, or was a natural cave enlarged by human agency. The entrance, which was carefully concealed among naturally projecting rocks, was a narrow passage about 40 ft. in perpendicular depth, and opened into a horizontal gallery of much larger area, and about 180 ft. long. The floor of this gallery was perfectly covered with coffins, mummies, statues and statuettes, and boxes filled with every variety of most valuable relics, manuscripts, inscriptions, preserved flowers and other funereal relics, etc. In this dry and rainless country, and at the hight of some 200 ft. above the neighboring plain, all these remains had been perfectly preserved in this limestone cave or tomb for 3,000 years, even more carefully than they could have been for so long a time in the best located museum above ground in any part of the world.

Four days after the discovery a government steamer, which had been telegraphed for, brought up the Nile to a point near the locality, and some 300 natives at once set to work to remove everything from the cave to the decks of the steamer, which was soon covered with the most precious freight which was ever floated at any one time upon the waters of that sacred river. The work was carefully and safely accomplished, and all was soon transferred to the Boulaq Museum of Antiquities.

Mr. Brugsch thus describes what he saw when he first entered this tomb: "My astonishment and bewilderment was so great and overpowering that I hardly knew whether I was awake or whether this was only a dream. I seated myself on a coffin to recover from the enormous excitement, and glanced at the lids of the various coffins, and clearly and distinctly saw the name of King Seti I., the father of Ramses II., both of the 19th dynasty. A few steps further on, in a plain wooden coffin, and with his hands crossed on his breast, lay Ramses II. himself. The farther I advanced, all the greater and grander were the riches that appeared before me. Here Amenophis I., there Amosis, the three Thotmes, the Queen Aahmes-nofert-ari, the Queen Aah-hotep, all the mummies being perfectly preserved—altogether, 36 coffins of kings, their wives, princes and princesses."

Our readers will generally feel more deeply the value of these discoveries when it is known that among the royal mummies are to be seen the embalmed bodies of Thothmes III, who lived about B. C. 1600, and Ramses II, who lived about 1330 B. C. It was the former who is supposed to have ordered the execution and erection of the two obelisks, one of which now ornaments the Thames embankment, in London, while the other stands in the Central Park at New York. They, in all probability, were originally placed as twin monuments upon either side of some grand gateway, either at Thebes or Heliopolise.

It is difficult to realize the fact that, side by side in the museum, one can now see the actual bodies, inclosed in their respective cases, of men whose orders caused the execution of these monuments which, in almost perfect preservation, have survived 3,000 years. It is curious to note in these cases containing the royal mummies the flowers (among the number the now obsolete lotus), and garlands with which it was the custom to encircle the neck of the embalmed body after swathing with cloth, perfect in form, but perhaps not unnaturally faded and dry. Among the writings are four large papyri rolls, from the translation of which much is expected; also many elaborate vases containing the hearts of defunct kings, queens, etc., several thousand small statuettes, a large number of ceremonial wigs perfectly preserved, four bronze chairs, etc., together with 46 boxes and chests of small articles of various kinds.

It is supposed that these royal mummies and other relics were removed from their original resting places to prevent their being desecrated by an invader, perhaps Cambyses, and placed for safety in the pit just discovered. This would seem to be corroborated by the fact that Belzoni found and took away to England a sarcophagus, but without any mummy, some years ago, and that the body for which that same sarcophagus was made, and said to contain at one time, is now found among the number collected in the Der-el-Bahari, and now lying side by side with the supposed father of Ramses II, during whose reign Moses was born. One of the most magnificent of the mummy cases is that containing the body of King Ramses' daughter (possibly the identical lady who found Moses in the cradle among the bulrushes), which is in a most perfect state of preservation, looking as it lies in its coffin, just as if it had only a few hours previously left the hands of the people whose duty it was to embalm and swathe it in its cloth.

Every one will await with impatience the translation of the various papyri, which form anything but the least important portion of this discovery, and may possibly prove its most valuable feature, as throwing conclusive light upon many points which are now much disputed among *savants* of Egyptology.

Sources of Energy.

In looking over Mr. Moore's lecture (which we give on page 372) on "Mechanical Powers," the kindred subject of "Sources of Energy" comes to mind; that is, sources of energy or nature which are available to man for the production of mechanical effects. Water, wind, electricity, we all recognize, and many dream of wave power or tide power. At a recent meeting of the British Association for the Advancement of Science, to the question whether the motive power of the tides could be employed for turning machinery, Sir Wm. Thomson gave an answer in the affirmative, but said he did not think it could be economically employed, inasmuch as the necessary dock construction would generally be far too expensive an item in its application. Still, he admits that there are, perhaps, half a dozen places in the world which are so situated that the tidal energy might be advantageously utilized as a motive power. Turning, however, to the wind, Sir W. Thomson finds a natural source of energy which is far more hopeful. Notwithstanding the advance in the use of steam, there is a vast amount of the world's work still done in the old-fashioned way—by means of wind. Witness the large number of sailing ships compared with steamers. On land, however, wind has not attained an equal importance. But Sir William argues that when our supply of coal shall become exhausted, or even when the fuel shall become unreasonably expensive to procure, on account of the depth, the danger and the heat of the mines, we may then turn with advantage to the wind. It is just possible, however, that the windmill may be replaced by some improved form of wind motor.

It is interesting to note in this connection the water-power which the American nation has at its disposal. In an address lately delivered before the Bankers' Convention at New York, an estimate was made of the large amount of horse-power obtained by damming up the following rivers—viz., the Passaic, at Patterson, 1,000 horse-power; the Merrimac at Lowell, 10,000; the Mohawk at Cohoes, 14,000; the Connecticut at Hardley, 17,000; the Mississippi at the Falls of St. Anthony, 16,000; the Androscoggin at Lewiston, 11,000; the Housatonic at Canaan Falls, 3,000; and the Oswego at Oswego, 4,000. The sum total of these is 75,000 horse-power, as estimated at a given point in each river. But this is used over again on an average not less than three times, showing a larger total of 225,000 horse-power. There are also many smaller streams in all the hill sections of the country which are utilized, and would furnish an aggregate equal to the last named figure. This great force of water power is, of course, likely to be thrown altogether in the shade by the proposed plans to utilize Niagara, by placing three turbines, 4 ft. in diameter, with 80 ft. of head, fed by a tube 7 ft. in diameter, each turbine giving 1,000 horse-power, with the whole strength of the great lakes and the Niagara river to reinforce them. The average flow of the river above the falls is 10,000,000 cubic ft. per minute. Converting this into horse-power under a head of 200 ft., a grand aggregate is obtained of 3,000,000 horse-power—a mighty force, sufficient to supply the economic wants of 200,000,000 people.

PROF. HENRY A. WARD has written from Singapore to the President of the California Academy of Sciences to say that he will not be able to reach San Francisco until the new year, at which time he proposes to exhibit his splendid collection of geological curiosities.

BRISTOL DISTRICT, Nev., will soon have a newspaper. The material of the old Tybo *Sun* has arrived there. The newspaper will be the Bristol *Times*.

Insectivorous Plant.

Physianthus Albens as a Moth Trap.

At the last regular meeting of the California Academy of Sciences, Robert E. C. Stearns read the following paper "On the Botanical relations of *Physianthus albens*, the Structure of its flowers and their peculiarities as an Insect Trap:"

The plant to which your attention is called is one of a highly interesting group; and this group is also related to many other groups which possess various important economical characters. Some of these have been known for a long time; others invite inquiry and afford a peculiarly fertile field for the investigations of the student in organic and pharmaceutical chemistry.

The species before us may be seen in many gardens and housyards in and around San Francisco and Oakland. At Berkeley upon the University ground and the private grounds in the neighborhood. Its rapid growth, hardy habit, clean shining leaves and sweet scented flowers, making it a favorite plant for ornamental purposes. The botanical name (I know no other) is *Physianthus albens*; it is a native of Buenos Ayres, and has been introduced as far north and east as Massachusetts, where it thrives as well it does here; it has also been noticed there as a moth-trap.

The genus *Physianthus* is included by botanists in the natural order of *Asclepiadaceæ*, of which some of the forms are popularly known as *Milkweeds* on account of the character of the sap, which exactly resembles milk.

Before proceeding farther with the milkweeds I will mention the principal related large groups like the Phloxes (*Polemoniaceæ*), ornamental chiefly, and natives of temperate latitudes, principally in North and South America; the Dodders (*Cuscutaceæ*), parasitic in their habits, and found in the temperate parts of both hemispheres, and unfavorably known here in California as a parasite on the *Alfalfa*, around the stems of which it winds its fatal thread and strangles the plant by preventing the upward flow of sap. The bindweeds (*Convolvulaceæ*) popular in some of its species by reason of their showy flowers; otherwise known by the sweet potato; from this group also Jalap scammony and the oil of rhodium are obtained. The plants abound in tropical, but are scarce in cold climates. The Sebestens (*Cordiaceæ*), mostly tropical forms, in both hemispheres, with panicled flowers and drupaceous fruit, some species of which are edible. The Deadly Nightshades (*Atropaceæ*), herbs or shrubs, with a wide distribution, include tobacco, henbane, mandrake, etc. The Nightshades (*Solanaceæ*): Among these are found favorite vegetables, like the potato and tomato, also the egg plant and other useful forms. The Olives (*Oleaceæ*), mostly inhabitants of the temperate zones, and principally known by the olive, whose drooping fruit is so largely used as human food, and otherwise familiar to us by the common lilac of our garden, also by the flowering ash and privet.

Having briefly noticed the principal groups related more or less directly to the *Asclepiads*, or milkweeds, let us now return to this latter group, with which our moth-trapping flower is more intimately connected.

Baird says:* They are chiefly shrubs, usually possessing a milky juice, and often twining. They inhabit, for the most part, warm and tropical regions, though there are many natives of northern latitudes. In general, they have acrid purgative, emetic and diaphoretic properties. The milky juice is usually bitter and acrid, but occasionally it is bland, and is used as milk, as in the case of *Gymnema lactiferum*, the cowplant of Ceylon, which the Cingalese use for this purpose. Many of the species of the genus *Asclepias* possess powerful medicinal properties. The roots of *A. curassivica*, or bastard ipecacuan of the West Indies are emetic, and are frequently sent to England as ipecacuanha.

The roots of *A. tuberosa*, or tuberous swallowwort of North America, are famed for their diaphoretic qualities, and are used in Virginia in inflammatory diseases. The sap of *A. Syriaca*, or Syrian swallowwort, is recommended as an expectorant. It is white, and contains a considerable quantity of caoutchouc. The nectaries or leaflets of the crown act as fly traps. The seeds of this and some other species are covered with down, which is well adapted for stuffing mattresses and pillows. They are hence sometimes called cotton plants. A good many of them are cultivated in Europe for their beauty. Their flowers have curious horned processes added to the corolla. The species of the genus *Stapelia* are singular-looking plants, forming at the Cape of Good Hope a stunted, deformed vegetation in the form of leafless succulent plants resembling some of the *Cactuses* and *Euphorbias*. The flowers are often very fetid, and are consequently called carrion flowers.

The leaves of *Solenostema argel* are used in Egypt to adulterate senna, and the fragrant roots of *Hemidesmus indicus* are used in Madras as a substitute for sarsaparilla, under the name of country sarza. The celebrated Hindoo medicine, mudar, used as a diaphoretic in India, is procured from the bark of the root of several species of *Calothropis*, especially *C. gigantea*. It contains a principle called Mudarine, which gelatinizes upon being heated and becomes fluid on cooling. Some of the species of the genus *Cynanchum* act as purgatives; the *C. monspeliacum* furnishing what is called the Montpellier scammony, and being used to adulterate the true scammony. Some of the genera furnish species which yield a dye said to be similar to indigo. The *Hoya carnosa* has a peculiar, waxy-looking blossom, and is called the wax flower. The silk plant of Madeira, *Gomphocarpus fruticosus* belongs to this family.

"The juice of *A. tuberosa* (pleurisy root, butterfly weed) is not milky. In all it is bitter and acrid, and contains Caoutchouc. The roots, etc., are diaphoretic, emetic or cathartic. The inner bark yields abundance of very long and fine, extremely strong fibers."*

From the foregoing glance at the various properties of the milkweeds, of which much more might be said, the structural peculiarities of their blossoms which are curious through the connection of the stamens with the stigma and the cohesion of the pollen into wax-like or granular masses, which are attached in pairs to five glands of the stigma, and removed from the anther-cells usually by the agency of insects (Gray id.), and equally or more curious as forming in the species presented herein, a simple but effective insect-trap, especially for certain moths.

A year ago this month I noticed upon the flowers of this plant *Physianthus* or *Araujia albens* growing in the flower-bed along side of the front porch to my house at Berkeley, and running up on the porch-rail, several moths fluttering as if trying to get away from the blossoms; upon careful examination I found they were in some way fastened to the flower, and were held by the proboscis, of which the tip was submerged or hidden in the interior of the blossom. Besides the living moths I found several dead ones, also hanging by the proboscis which was attached to the flower in some way. Knowing that so many of the plants of this group are poisonous, at first thought it occurred to me that the insects might be poisoned or perhaps intoxicated by some peculiar property of the nectar.

Supposing that I had made a new discovery, as to the insect-catching, or, more properly, moth-trapping peculiarity of *Physianthus*, I dissected blossoms to which moths were attached, and found that whether the nectar was harmful or otherwise, the trapping was wholly mechanical and due to the peculiar form of the anthers. After making drawings of the plant, its flowers and the various parts of the flower, so as to show the construction of the trap and related parts, I sent specimens of the moth East to my friend, Dr. Packard for identification. In the meantime, I learned that *Physianthus* as a moth-trap had long before (*American Naturalist*, Jan. 7 and Feb. 7, 1880) been noticed, and by several parties at various times; more recently in Providence, R. I., Springfield and North Woburn, Mass., and notes of these observations had been published from time to time.

The matter, however, was new to me, and the investigation an ample reward for the trouble. It is none the less interesting because previously made known—though for this reason I have not brought it to the attention of the Academy before. My interest in the subject has also been revived by the recurrence of the moth season, and consequently additional and recent observations. On Saturday last (Nov. 5th) I detected the first entrapped moths of the season, *nine* in number, some dead, others apparently just caught. On Sunday (yesterday) Nov. 6th, eight or nine more, some just alive, others just caught; this morning (Monday, Nov. 7th,) five more; (Tuesday, Nov. 8th, windy and cold day,) two; (Wednesday, Nov. 9th, windy and cold,) two.

In figure 1 we have a spray of Physianthus, which gives an idea of the general aspect of the plant, its leaves and flowers.

In figures 2 and 3, the flowers with the moth upon them showing a back and also a side view of the insect.

In figure 4 the perianthum or perigonium constituting a single flower or blossom.

5 The stamineal mass or corona staminea, *a* is the anther wing, *b* exterior spurs to anther.

6 Gynecium, showing ovaries *a*, stigma *b*, pollen-masses *c*, and glands *d*.

7 Anther, showing wings *a*, and exterior spur *b*.

8 Side view of anther, showing wings *a*, and spur *b*.

9 Oral view, showing how the spurs head in and up against the winged anthers, and the edges of the wings of the anthers in pairs.

On turning to the figure of the flower it will be noticed that it is trumpet-shaped, flaring at the mouth where the petals divide then uniting and forming a tube which is swollen into a bulbous form where the corolla joins on to the calyx.

Now this exterior tube being pulled off reveals the anthers with their exterior spurs, pressing against the gynecium and hiding the ovaries and the pollen.

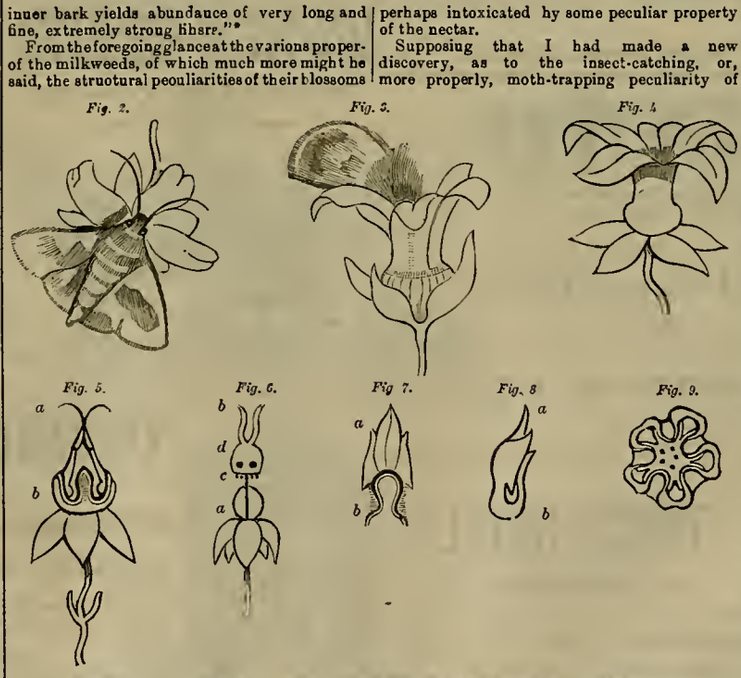
The moth in pursuit of the nectar, which is inside of the anthers near the top has to thrust the proboscis down the tube of the flower, describing a curve between the exterior of stamineal crown or mass and the inside of the hulh of the perigonium, then push the proboscis upward between the edges of the anther wings, as far as may be necessary to reach the pollen masses, and after sucking until the nectar is exhausted or hunger is satisfied, attempts to withdraw the proboscis from the flower; but the edges of the two anthers, between which the proboscis has been thrust, being rigid and angular, act as a vise, or in the same way that a boot-jack holds a boot, and the more the moth pulls the tighter the grip; so unless the flower has reached that degree of maturity, so that it has begun to wilt before the vitality of the moth is too far exhausted, escape is impossible. When its flower begins to wilt the tissues are so softened that a vigorous moth may sometimes escape.

The species of moth which is most frequently trapped in the East is *Plusia precationis*, and it is an interesting fact that the species which I have detected at Berkeley, as the victims of this plant, belong to the same genus though not of the same species.

In a single instance I have also obtained a butterfly of the species known as *Pyrameis Caryæ*.

Other insects, ants, beetles, etc., are often found in the nectar of this flower, but not as prisoners.

FIG. 1.—LEAVES AND FLOWERS OF PHYSIANTHUS SLIGHTLY REDUCED.



TRAPPED MOTHS AND THE PHYSIANTHUS BLOSSOM DISSECTED.

*Dictionary of Natural History, London, 1860.

*Gray's Structural and Systematic Botany.

NOVEL ENGINEERING OPERATION.—Some time since the United States Government decided to abandon the barracks and quarters on Goat island, in San Francisco bay, and all the property was removed. Lately it was found that new buildings were necessary at the Presidio and the idea occurred to the officials to remove the Goat island buildings to that place. The distance by water from the island to the Presidio is some five miles. The officers' quarters were separate, two-story buildings, with verandahs, etc. These were separately launched on to large scows and then the scows with their top-heavy freights were towed by the U. S. steamer *General McPherson*, to the Presidio beach. Here the houses were disembarked by means of skids, and then drawn into position on the Presidio grounds. The larger buildings were removed in sections. The officers' houses were taken singly and not broken in any way, even the brick chimneys, three in each house, remaining in position. It was quite an undertaking to remove such large structures in the manner indicated.

J. W. PINKERTON, for the last 16 years superintendent of the Pittsburg coal mine, in Contra Costa county, has resigned his position and gone to New Tacoma, Washington Territory, to take charge of the railroad companies Carbon Hill coal mines. The Mount Diablo people were very reluctant to lose Mr. Pinkerton, who has been a faithful and efficient officer; but the offer of the railroad company was too tempting for that gentleman to refuse, and too high for his old employers to compete with.

PARTIES who own patches of timber out along the line of the Carson and Colorado railroad are now able to get some money out of their property. Many of these men have been holding their claims for years, without knowing just how they were to get any profit out of them.

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It makes smooth and even lumber, leaves no stubshot, and will cut any sized log up to four feet in diameter.

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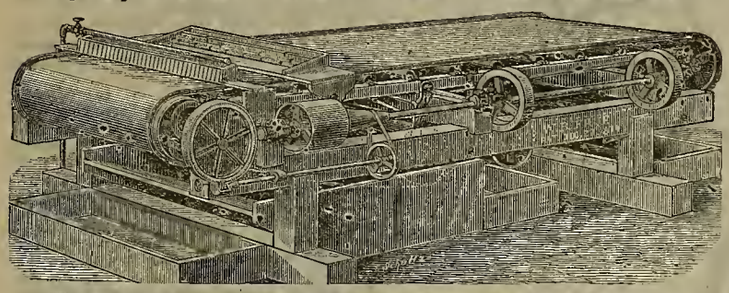

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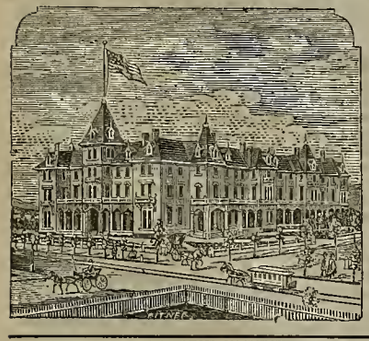

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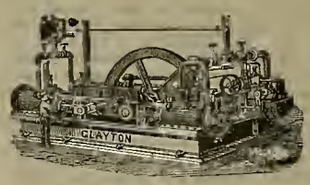

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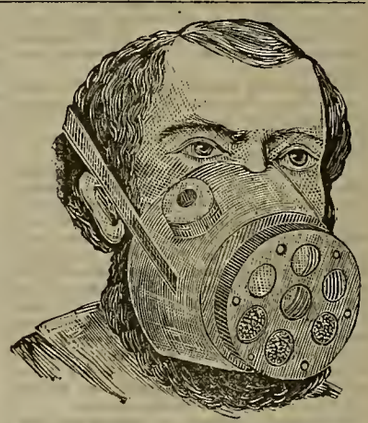
Prevents Lead Poisoning and Salivation.



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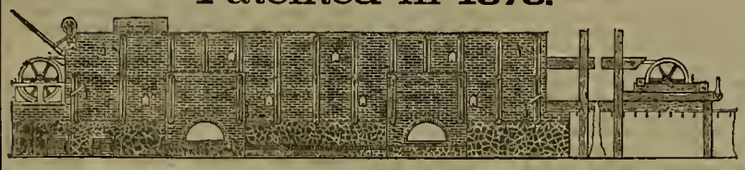

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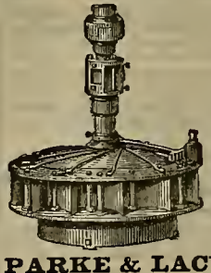

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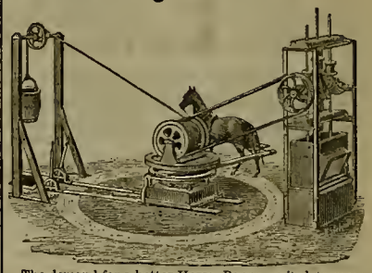

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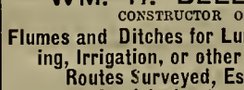

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING NOVEMBER 15, 1881,

249,499.—PUMP—L. Bouvier, San Diego, Cal.
249,581.—VEHICLE GEAR—G. G. Buckland, Tulare, Cal.
249,606.—ADDING MACHINE—P. C. Forrester, S. F.
249,607.—JOURNAL AND BOX—Wm. H. Foye, S. F.
249,640.—HAY PRESS—L. B. Lathrop, Hollister, Cal.
249,650.—PACKAGE FOR TRANSPORTING LIQUIDS—H. Mattullath, S. F.
249,485.—CLUTCH FOR CONVERTING MOTION—J. W. Ross, Santa Clara, Cal.
249,701.—EXPLOSIVE COMPOUND—Thos. Varney, Oakland, Cal.
249,561.—FRUIT AND BERRY BOX—C. W. Weston, S. F.
8,841.—TRADEMARK—Quicksilver Mining Co., S. F.
249,720.—CRANK HANDLE—C. T. Wright, Bodega, Cal.
249,482.—DEVICE FOR MECHANICALLY OPERATING MUSICAL INSTRUMENTS—C. C. Reynolds, Kelseyville, Cal.

FOR THE WEEK ENDING NOVEMBER 22, 1881.

249,869.—SULKY PLOW—Geo. Applegate, Yoncalla, Ogn.
249,890.—SULKY PLOW—L. Brown, Waitsburg, W. T.
249,901.—CHURN—A. H. Conkling, Vallejo, Cal.
249,921.—FLAX-PULLER—S. W. Gaines, Scio, Ogn.
249,764.—WINDOW SCREEN ATTACHMENT—B. T. Herold, Stockton, Cal.
249,973.—DISH-WASHING MACHINE—W. C. Nelson, Santa Rosa, Cal.
249,701.—AMALGAMATOR AND CONCENTRATOR—C. W. Patten, S. F.
249,995.—MACHINERY FOR CONVEYING AND CRUSHING ORE—J. Richards, S. F.
249,996.—PNEUMATIC MACHINERY—J. Richards, S. F.
250,015.—ORE-ROASTING FURNACE—Jas. M. Thompson, San Francisco.
249,814.—RUNNING GEAR FOR VEHICLES—E. Whitmore, San Francisco.
250,027.—DRAW BRIDGE—E. A. Wible, Brighton, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Lectures to Young Mechanics and Apprentices.

Mechanical Powers.

On Thursday of last week, Robert S. Moore, son of Joseph Moors, of the Risdon Iron Works, delivered a lecture as one of a course now being given to the young mechanics and apprentices of this city. The subject chosen was "Mechanical Powers." Most of the lecture was devoted to establishing the first principles of mechanical power with application to levers, pulleys, chain tackles, cranes, etc., and in establishing the principle of work together with a good understanding of the unit of mechanical power, namely, the foot pound. We present the following as a synopsis of young Mr. Moore's remarks:

You remember that in the lectnre delivered here two weeks ago by Mr. Richards, on the subject of "Constructive Processes," he gave us a certain classification into which everything in the domain of machinery could be included. His four classes were, as I remember them, machinery of transmission and distribution; machinery for utilizing natural forces; machinery of power and machinery of transportation.

At the same time he offered the suggestion that some one in the audience would take up either of these subdivisions for an evening's talk, and for want of a more appropriate subject I have followed his advice, and will therefore ask your attention to-night to the subject of "Mechanical Powers."

While I am sorry to detain those who are already familiar with this most important branch of mechanics, yet, at the same time, I feel it my duty to address myself to those for whom these lectures were solely originated, namely—the young mechanics and apprentices of San Francisco.

To them I would say that in order to derive any benefit whatever from a lecture of this nature, they must pay the closest attention possible, no matter how dry and uninteresting it may seem to be.

On their account also I have prepared a lecture of the most rudimentary character, and hope to hear no one say that the subject selected was too deep for them. On the contrary, I have assumed that those present never heard of mechanical powers before, and therefore my remarks cannot fail to be within the comprehension of all.

Mechanical powers are certain machines which enable us to apply economically large forces to produce small effects, and small forces to produce great effects, and which are further capable of transferring forces from their natural point of action to another point of application.

The Combinations and Arrangements of Mechanical Powers

Are numberless, but the primary elements of which each and every one is composed are two and only two, namely, the lever and the inclined plane, the former of which will occupy most of our attention to night. By the lever, as you will observe from the figures upon the board, power is transmitted by circular or angular action and by the inclined plane by rectilinear action, the principle of the lever as will be hereafter shown, being the basis of the wheel and axle, while the principle of the inclined plane is the basis of the wedge and screw. In other words, pulleys are nothing more or less than levers of particular kinds, and similarly wedges and screws are only different forms of the inclined plane.

The elementary lever is an inflexible straight bar turning on an axis or fixed point called the fulcrum, the force being transmitted by angular action about the fulcrum from the point where power is applied to the weight to be raised.

Levers are of three varieties, according as the fulcrum, the weight or the power, is placed between the other two, but the action in every case is reducible to that of three parallel forces in equilibrium. [Here the three kinds of levers were shown by sketches on the board].

These are therefore the three and only three classes into one of which all levers, pulleys, wheels, etc., of every conceivable description can be included.

Having explained these various levers, we are now ready to investigate their powers and show the advantages to be gained by the use of them. This we shall do by

The Principle of Work.

Not that it is the simplest or most generally used method (for I have never seen the subject treated in this manner before), but because it introduces the all important foot pound, the true meaning of which should be thoroughly instilled into the mind of every apprentice, before he can ever succeed in obtaining a true knowledge of either theoretical or applied mechanics.

As hydrogen is the unit of atomic weight, so is one foot pound the mechanical unit. As one cubic foot of distilled water is the unit of specific gravity for solids, so also is the one foot pound the unit of mechanical power. By the term foot pound we mean one pound raised one foot high per minute; in other words, it is a relation between time, space and weight raised, which is recognized by the engineers of the whole world as the standard basis for their mechanical calculations.

We have, then, from the definition of one foot pound, the mechanical work developed in raising any weight (expressed in foot pounds) equal to the weight of the body into the distance through which it is raised per minute. [Here the lecturer drew illustrations representing graphically the foot pound, and also the amount of work developed in raising the different weights through given distances.]

So far, I have spoken of these various weights moving through certain distances; but it is evident that it is the same thing, whether we say one pound moves through a distance of one foot per minute, or with a velocity of one foot per minute.

Hence, in future when I speak of the velocity per minute, you will know that it means precisely the same thing as distance traveled per minute, the two words being interchangeable.

In the above illustrations I have purposely taken simple weights and heights, so that you would instantly recognize the fact, that the different weights and the respective heights to which they are to be raised, varied according to a certain law, which in mechanics is called the

Principle of the Equality of Movements,

And which, by referring to the above figures, can be enunciated as follows: "What we gain in weight we lose in velocity, and what we gain in velocity we lose in weight." Upon this one principle hangs the secret of all mechanical power.

This then, together with the definition of a foot pound, is all I ask you to memorize; if you forget it deduce it again for yourselves; if you have paper and pencil with you now, write it down as a basis for all future investigation of mechanical powers.

The speaker then referred to the crane, band winch, block and fall, hydraulic jack and differential pulleys, as practical examples of mechanical powers, showing by sketches how the power of each depended upon the above fundamental principle and, furthermore, how any apprentice present could readily calculate the power of the most intricate machine, providing he knew the number of feet traveled by the power for every foot traveled by the weight.

It was the want of a true understanding of this principle of velocities that had misled so many would-be inventors in their useless search for perpetual motion.

He also showed why perpetual motion could not exist; how one pound of work expended could only produce or develop an equivalent amount of work.

He also showed how, in moving heavy weights by tackles, the common error was made of passing the hauling part around a pulley attached to some rigid wall instead of first passing it around the movable pulley attached to the moving weight, thereby gaining twice the power.

The incline plane and its different forms (the wedge and screw), were next discussed.

The wedge, the power most commonly used in the mechanical arts, was dwelt upon at length. He showed that instead of raising a weight by moving it along the inclined plane, the same thing was accomplished by pushing the inclined plane under the weight.

After explaining to the apprentices what a horse power was, and that the object Watt had in adoptiog it was to establish the relation between the power of a horse and a certain-sized engine, he closed, hoping that the next time the attention of those present was attracted to any weight he raised, the principle of velocities would rise unconsciously in his mind, clearing away that which before was doubt; that which until now was mystery.

News in Brief.

FIVE hundred Danish farmers have located in Falls county, Tex.

IT is reported that tin has been discovered on the Bitter Root, in Montana.

LARGE herds of buffalo have recently been seen at Glendive, in Montana.

THE first mine in the United States was discovered in South Carolina in 1790.

THE production of iron ore on Lake Superior is now over 3,000,000 tons annually.

GEN. SHERMAN recommends fewer garrisoned posts and forts and a larger standing army.

THE subscriptions to the Garfield Memorial Hospital at Washington, have reached $86,000.

THE United States and Canada have shipped 883,975 barrels of apples to England this fall.

THE cotton crop of Texas for 1881 is estimated at 734,450 bales, against 1,040,000 last year.

E. J. BALDWIN is going to plant out 200,000 additional vines this winter in Los Angeles county.

THE borax interests in the Mohave desert appear to be very profitable, and shipments are increasing.

THE paymaster of the United States army don't handle as much money as a section foreman on a new railroad.

AN only sister of Edmund Northrup wishes to learn his address. When last directly heard from he was at Knight's Landing, Cal., in 1867. Address Mrs. Adeline Burnside, Audubon, Iowa.

THE Mayor has signed the order prohibiting the manufacture of gas from crude petroleum within the district bounded by the water front, Larkin, Bay, Devisadero, Ridley, Castro, Sixteenth, Center, Carolina and Channel streets.

THE railroad track from Newark to Centerville has been graveled, and will soon be in condition for use. The Bay & Coast Telegraph Co. will shortly put up their wire connecting the two towns, and establish an office at the latter place.

A MILLERTON correspondent of the Fresno *Expositor* relates an attempt at suicide by a crippled dog in that place, who deliberately leaped from a window in the old court house to the pavement, fully 20 ft. below. The fall did not disable him, however.

ON Wednesday of last week Mrs. Louisa Rodriguez, who lives on the road from Washington Corners to Alvarado, was bitten on the cheek by a spider. The spot continued to swell and enlarge its area until the head, neck and adjacent parts were involved, and resulted in death last Monday.

THE Garfield Relic Bureau, Cleveland, is now prepared to select small *facsimilies* of the beautiful shields which ornamented the corner of the catafalque, and easels, fans, canes, brackets, frames, watch-holders, and various other ornamental designs, made from the wood of the pavilion. The receipts, beyond the cost of manufacture, will be given to the Monument Fund.

PIONEER TIMES IN CALIFORNIA.—Sketches of the "olden time" in California are exceedingly interesting, both to those who survive their participation in them, and to the junior race of citizens who can count their California years on their fingers. The latest contribution to pioneer literature is a book entitled "A Picture of Pioneer Times in California, by Wm. Gray, and is offered for sale by A. Roman, agent, 120 Sutter street, S. F. This work treats of pioneer life in California, more particularly in San Francisco and the coast towns and cities, including the old Missions and Spanish settlements, and treating upon California life up to the time of our late civil war. This book is respectfully dedicated to the boys and girls born on the Pacific slope, of pioneer parents. Its object is to draw a correct and faithful picture of pioneer times in California and thus expose the misstatements of itinerant lecturers and thoughtless or vicious writers, who seem to delight in wholesale misrepresentations of the habits and character of the first American settlers of this coast. The time has come when this matter should be discussed and set right. The pioneers are fast passing away, and in a few short years, not one will be left to contradict and expose the slanderous charges now constantly put forth against them. The book is published in inviting style, and will undoubtedly have wide sale.

THE Chrysolite mining company has declared a dividend of 50c per share, amounting to $100,000, payable at New York on the 10th December. This is the 11th dividend, and the total is $1,600,000.

The diamond drill at the Yellow Jacket is still finding low-grade ore.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francisco.

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Dewey & Co.'s Patent Agency and the business offices of the Mining and Scientific Press, Pacific Rural Press, Pacific States Watchman, and the Fraternal Record, are now favorably situated at No. 252 Market St. Elevator entrance, *No. 12 Front St., S. F.*

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OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

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IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

San Francisco Metal Market.

[WHOLESALE.
WEDNESDAY, November 16, 1881.

IRON.—		
American, Pig, soft, ton	— —	@30 00
Scotch, Pig, ton	25 50	@27 50
American White Pig, ton	— —	@— —
Oregon Pig, ton	— —	@ - —
Clipper Gap, No. 1	— —	@26 00
Clipper Gap, White	— —	@30 00
Clipper Gap Car Wheel	— —	@33 00
Refined Bar	4 @	7¼
Horse Shoes, keg	— @	5 50
Nail Rod	— @	7¼
Norway, according to thickness	6¼@	7¼
STEEL.—		
English Cast, ℔	13 @	15
Black Diamond, ordinary sizes	— @	15
Drill	15 @	16
Flat Bar	16 @	18
COPPER.—		
Ingot	— @	22
Sheet	— @	30
Sheating, Tinned 14x18	— @	31
Nails	— @	—
Bolts	— @	33
Old	— @	—
Bar	— @	22
Cement, 100 fine	— @	15¼
LEAD —		
Pig	— @	5
Bar	— @	6
Pipe	— @	8
Sheet	— @	9
Shot, discount 10% on 500 Bags		
Drop, per bag	— @	2 10
Buck, "	— @	2 30
Chilled "	— @	2 50
TIN PLATES —		
10x14 I C Charcoal	— @	7 50
10x14 I C Coke	6 15 @	6 40
Banca Tin	— @	22 50
Australian	— @	23 50
I. C. Charcoal Roofing 14x20	— @	6 90
ZINC —		
By the Cask	— @	9
Zinc, sheet 7x3 ft. 7 to 10 ℔, less the cask	— @	10
NAILS.—		
Assorted Sizes	4 00 @	4 15
QUICKSILVER.—		
By the flask	40 @	41
Flasks, new	— —	@ 1 25
Flasks, old	— —	@ 1 05

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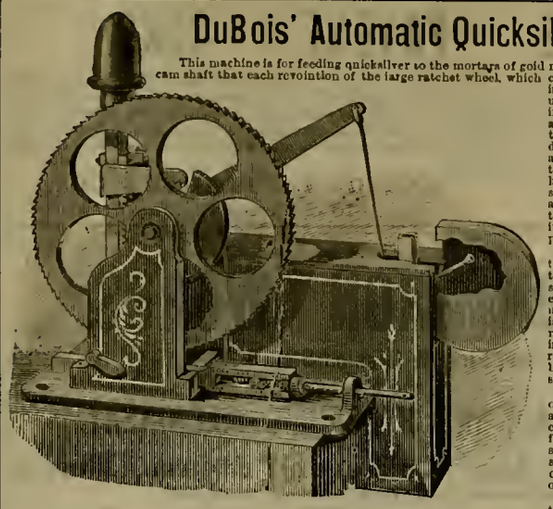

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

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OFFICE OF THE

Standard Consolidated Mining Company,

SAN FRANCISCO, DECEMBER 2, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 35, of Seventy-five Cents (75 cents) per share was declared, payable on Monday, December 12, 1881, at the office in this city, or at the The Farmers' Loan and Trust Company in New York. WM. WILLIS, Sec'y.

Office—Room No. 20, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

SAN FRANCISCO, CAL., DECEMBER 2, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 36, of Seventy-five Cents (75 cents) per share was declared, payable on Monday, December 12, 1881, at the office in this city, or at The Farmers' Loan and Trust Company in New York. WM. WILLIS, Sec'y.

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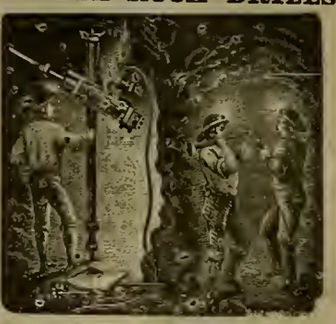

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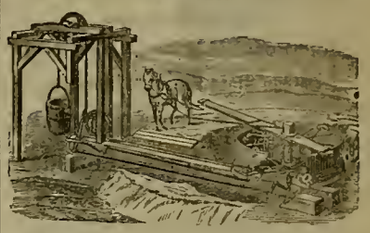

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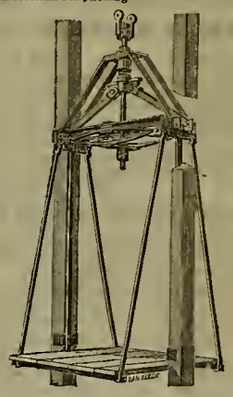

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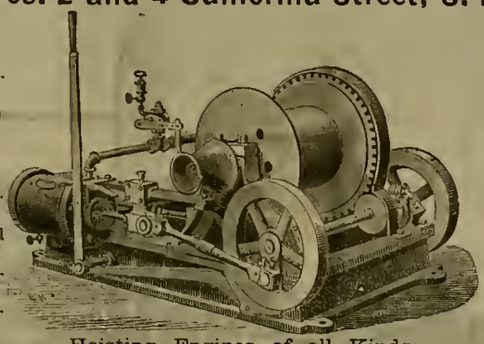

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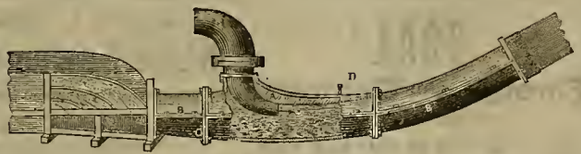

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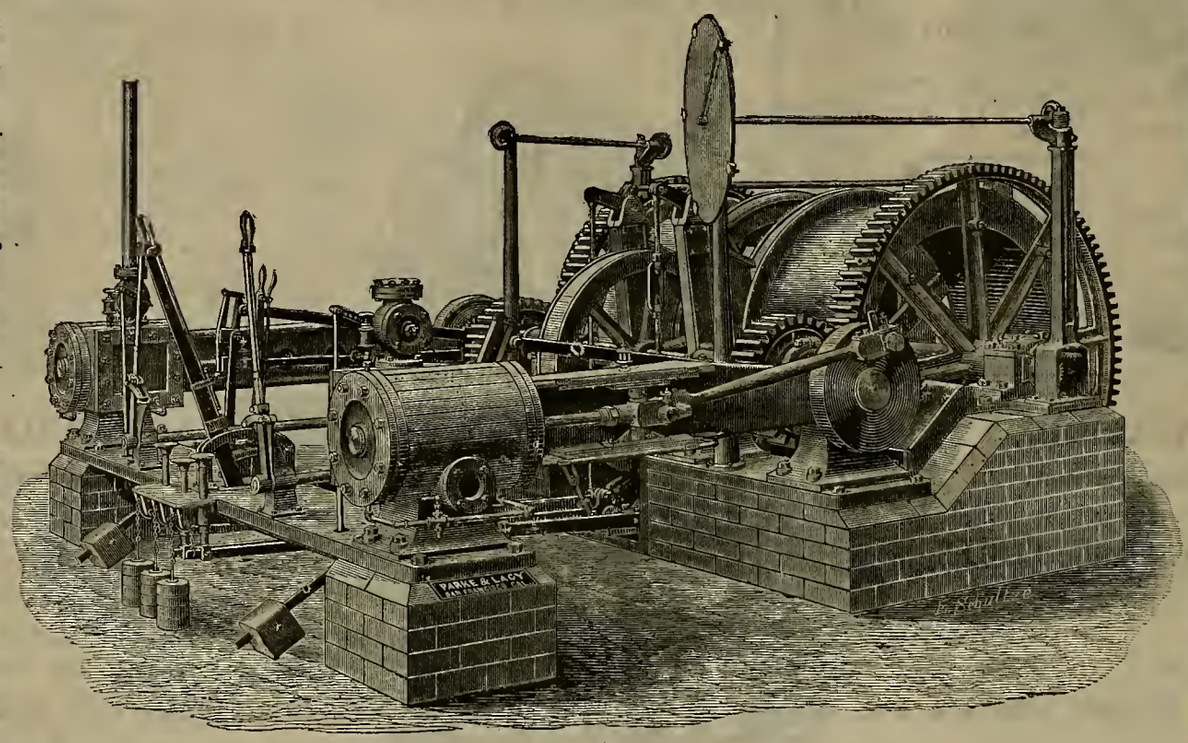

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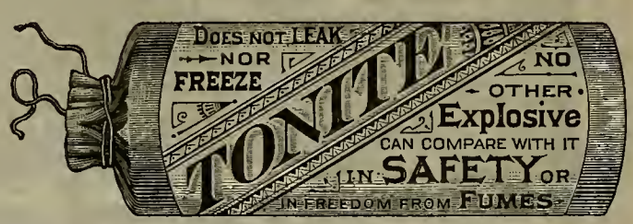

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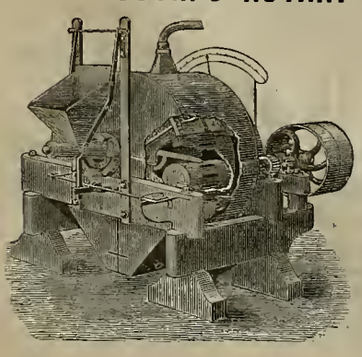

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, DECEMBER 10, 1881.

VOLUME XLIII Number 24

The Harris Dry Gold Separator.

The Harris tubular iron dry gold separator is a machine, as its name indicates, intended to work placer or gold-bearing earth where there is no water. The machine screens and elevates the earth, throws away the dross and saves the gold, with two currents of air, no water or quicksilver being used.

After experimenting with this machine for some months, it was sent to Arizona, and there tried, the inventor tells us, with success, saving the gold and doing more than one-half more work than other machines of the class. The old Mexican plan of working dry placers is very crude. It consists in winnowing or throwing the earth up and down on a rawhide in the wind, the nuggets being saved. Of course this will only do with coarse gold. Modern invention has elaborated this crude idea, however, in such a way that earth containing fine particles of gold can be utilized, and not only the nuggets, but the finer gold be saved.

The Harris machine is so constructed as to have two currents of air, one to agitate the material, and the other to carry off the dross while the gold is being separated. The machine has a good solid frame made of tubular iron, and can be readily taken apart for transportation, and put together without the use of tools. The dry earth, sand or gravel is then thrown up on a series of screens, and falling through on an endless belt or elevator, is thrown up into the hopper, and falling from the hopper to the riffle-board, it passes through the current of air from behind the hopper, falls on the adjustable riffle-board under which a pulsating intermittent current agitates the earth that has fallen there, and carries on a process of concentration, the finer particles of dirt and dust being thrown away by the current behind before falling on the riffle-bed; screenings that contain gold may fall into a crusher or be carried off behind the machine. Riffles are placed at suitable distances on the riffle-board, and behind those the gold is saved. The adjustable riffle-board is constructed so as to save the finest of gold.

The difficulty with most of the dry washers is a tendency of the dirt to pack. In this the finest of the dust is thrown away before reaching the riffle-board, so there is, of course, no chance for that to pack. Neither water nor quicksilver are necessary to work dirt with this machine. They are made of tubular iron, with no cogs or cast-iron to wear out or break. Capacity, twenty to forty tons per day of ten hours, according to the nature of the material and the size of the machine. Weight, from 150 to 350 pounds. Price, $150 to $250; larger or smaller ones in proportion; they may be run either by hand, steam or horse-power. Mr. Harris, the inventor and manufacturer, 308 Mission street, in this city, has a number of testimonials from those using this machine, which may be seen by those interested.

MECHANICAL LECTURES.—The lectures to young mechanics and apprentices, now being delivered at Capt. McNevin's nautical school, and of which we are weekly presenting full reports, are very useful and are attracting good audiences. In addition to this, after the lecture, a discussion, in the nature of a debate, sometimes takes place. We give this week a portion of the lecture given by Capt. Phillips, superintending engineer of the Oregon Railway & Navigation company, and Harbor Commissioner.

G. W. GRAYSON, the prominent mining operator, and a leading owner of the Day mine, Bristol, Nev., has had a town named after him, which is located about a mile below Royal City. The four new furnaces of the Day Co. are to be erected at Grayson, as they will save large amounts in hauling ore and in price of charcoal. The water is brought eight miles. The furnace at Bristol will be kept running till the new works are ready.

Academy of Sciences.

At the regular semi-monthly meeting of the Academy of Sciences, Prof. Davidson presided for the first time in some months. Quite a number of candidates for membership were proposed, but will not be balloted for until the annual election, no members being elected in the month preceding that.

A number of reptiles and insects from Arizona were donated to the Museum. Ivan Petroff presented a wooden mask of the Ongalentze Indians, used in dances in memory of deceased persons. Among other things, W. F. McAllister presented a skull from Tombstone district, Arizona, said to have been found many feet below the surface in one of the shafts. B. B. Redding donated a Shoshone knife or spearhead from Paradise valley. Capt. C. L. Hooper of the U. S. revenue steamship *Corwin*, presented a pair of emperor geese, shot on the Yukon river, Alaska, and a pair of moose horns from the same locality.

E. F. Gerald donated a piece of vanadinite or vanadate of lead from a mine 45 miles above Yuma, on the Colorado. This mineral was first discovered at Zimpam, in Mexico, by Del Rio, in 1801. It has since been obtained also in the old workings at Wanlockhead, Dumfreshire. Vanadium is a rare mineral. It is found in vanadate of lead and vanadate of copper, and also combined with lime. The crystals are beautiful in color and form, looking like shade of coral.

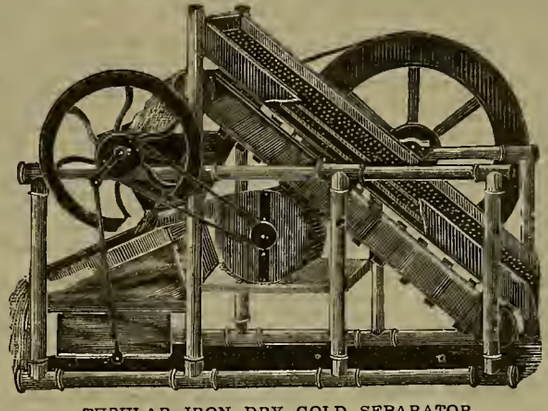
The Grate Elevated.

G. G. Lemmon read a paper describing a new species of Gentian, which he named *Gentiana microcalyx*, Lemmon. This description we shall publish in a future number of the PRESS.

R. E. C. Stearns read a paper "On the Growth of Certain California Forest Trees and Meteorological Data Suggested Thereby." This paper brought out considerable discussion, as the point was advanced that some connection could be traced between the rings, denoting growth and the dry years. Prof. Davidson and Messrs. Behr, Kellogg, Brooks and Stearns all spoke on the subject, it being generally conceded that while some law did exist, proving the relation between the ring growths and the climatic influences, it would be difficult to show the connection. Mr. Stearns' paper, being drawn up from meager data, was simply offered as suggestive of further research in that direction.

Poisoned in Preparing Specimens.

Charles G. Yale, Secretary of the Academy, read a tribute to the memory of Henry Chapman, naturalist, deceased, and offered resolutions of respect, which were adopted. Mr. Chapman was one of the pioneer members of the Academy, and Curator of the department of birds and mammals for several years. He was an enthusiastic collector of natural history specimens, and did a large amount of gratuitous work in preparing various specimens in the Academy's collection. Prof. Davidson, Mr. Redding, Mr. Stearns, Dr. Kellogg and Mr. Harford all spoke feelingly of the merits of the deceased and of the loss entailed on the association by his death. The Secretary stated in his remarks that Mr. Chapman's long life of unparalleled industry was brought to a close by devotion to his chosen pursuits. A skilled taxidermist, he so devoted himself to his business from his love of it, rather than from gain, that he was slowly poisoned by the arsenic used in the preservative powder used in preparing specimens. Once before his blood was poisoned by absorption of these substances, but the warning was unheeded. He was, in his work, in a constant atmosphere of arsenical vapors or powder, which was slowly absorbed into the system with a fatal result.

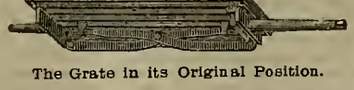


TUBULAR IRON DRY GOLD SEPARATOR.

An Adjustable Grate.

The Adjustable Grate Manufacturing Company, of 123 California street, is one of the new industries of this city. It was formed to manufacture the peculiar form of grate shown on this page.

The object of this grate is to raise the fire at will by means of the shaker, from its original position to any desired hight, and by this save both fuel and time. The grate can be placed in any range now in use, and requires neither alterations in the stove nor skilled labor to insert it, as the adjustable grate will fit in exactly the same place where the stationary grate was taken out. For convenience, economy, broiling, heating flatirons, and quick baking, this invention is very useful; besides, it is a preventive against the settling of clinkers on the sides of the bricks.



The Grate in its Original Position.

The construction is simple, and the heat will not, therefore, affect it, so the grate will last as long as the stove. When people want to put the grate into a stove already made, it is necessary to give the name and number of the range, and state whether it has a water-back or not.

WE see by the Pioche *Record*, that considerable iron ore is being hauled from Short & McDougall's mine at Stampede to the smelter at Bullionville. This ore is sold on the dump at the mine for $5 per ton, and the smelting company pay $5 50 per ton for hauling it to the furnace. Short & McDougall will ship in the neighborhood of 300 tons of ore this month.

Transmission and Storage of Power.

Since the discovery of the Faure battery, in which electrical energy may be stored up, the possibilities of the transmission and storage of power have become much enlarged. As yet, however, nothing much has been done in this direction, though no less an authority than Sir William Thompson considers it unquestionably possible to transmit the power of waterfalls by means of conducting wires to distant stations, so as to use it, perhaps, at 100 miles from its source. The attention which Faure's battery has recently excited is likely to lead to valuable practical results in this direction. Sir W. Thompson suggests that by means of a huge battery on this principle it would be possible to draw off a continuous supply of power from the electric main, and then to distribute it in small and manageable quantities to factories or shops or even private dwellings, where it might be used to drive lathes, or to work sewing machines, or to produce the electric light or, in fine, to perform any service of which electricity is capable. It seems likely that the storage of electricity will not only open up a splendid future for the application of this potent power, but will render it possible to utilize some of the natural sources of energy which have, hitherto, been unmanageable, and have consequently run to waste.

In this way they may yet utilize the power of Niagara. We, on this coast, could utilize some of our mountain streams in the same way. Constant experiment is being made to thoroughly perfect the system, the principle of which M. Faure has proved to be practicable.

A NEW MINING CAMP.—A great deal of prospecting is being done and not a few valuable discoveries are being made at various points to the eastward within range of the Carson and Colorado railroad. The Lyon county *Times* says: A new district, called Crabb district, after its discoverer, S. Y. Crabb, is now attracting the attention of prospectors. It is situated on the old Wellington and Aurora toll-road, nine miles east of what is known as the East Fork bridge, over Walker river. Some very good ore has been discovered, and a number of houses have already been put up to accommodate the workmen. The district is in a heavily timbered and well-watered country. An eight-mile haul, all down hill, will take the ore to the river, where grading for a mill has been commenced, just above the Rose stock ranch. a great many locations have been made, and there is considerable excitement in Mason valley and that neighborhood over the prospects.

A COLORADO paper having asserted that a mine which had paid 20 consecutive dividends of $25,000 each, thereby showing the finest record of any mine in the country, the Tombstone *Epitaph* reminds it that the product of the boasted mine is just one-half the amount paid by the Tombstone M. & M. Co. in the same period of time, and they have three good mines and seven fine prospects left; that it is just a little over one-third of what the Contention mine has paid in a like period, with reservoir to draw many times that, and that two mines on the Comstock paid over four times as much per month as the Colorado mine paid in 20.

COPPER PRODUCTION OF THE UNITED STATES. The final census report upon the production of copper in the United States east of the 100th meridian during the census year ended June 1, 1880, shows that 32 mines put out 1,005,955 tons of ore, or 50,655,140 lbs. of ingot copper, valued at $8,842,961, on a capital of $31,675,096, employing 6,116 hands. Maryland is credited with one mine in Carroll county which produced 164,640 lbs. of copper worth $1,200. North Carolina produced 1,640,000 lbs. of metal.

C. P. HUNTINGTON, in behalf of the Central Pacific railroad, has signed a contract with Wm. Cramp & Sons to build a large iron steamship of 5,500 tons, for the Pacific coast and freight trade. The vessel is to be 350 ft. in length. Another steamer will be contracted for in a few days.

The Debris Problem.

The State Mineralogist's Opinion.

An *Examiner* reportsr, who interviewed Mr. Henry G. Hanks, State Mineralogist, elicited from him the following statement:

In the mines I found a prosperous, industrious and intelligent body of men, who, after planning engineering and mechanical works of great magnitude, requiring the expenditure of years of patient and persistent labor and the outlay of immense capital, were just beginning to reap the results of their labors. I saw men, superior in every way to the same class in any other country, working industriously to support their families, and educating their children to be good citizens of a noble State. Besides the happy homes of the miners, I found merchants thriving while supplying the mines and miners with indispensable requisites; mechanics plying their various trades and callings; school teachers filling the responsible and important position of imparting wisdom and education to bright, intelligent and healthy children; saw mills cutting timber for flumes, lumber and boards for dwelling houses and stores, all running to their fullest capacity; teamsters hauling heavy loads of general merchandise and machinery to the mountains, their wagons loaded with goods, presumably purchased directly or indirectly in San Francisco. All this visible prosperity was the result of the successful working of the mines, a large proportion of which are hydraulic.

On making inquiry I found that much of the capital employed had been invested by foreigners, who, placing faith in both the State and the General Government, from whom the land had been purchased at a double price—land which had been set aside from the agricultural lands and sold expressly for mining purposes—believing that the United States Government would act fair by them, they had bought the mining lands in good faith, and had joined our own people in the investment of millions of dollars of capital, knowing that many years must pass before it was possible to receive any return on the capital. They had brought water from lakes and streams many miles distant; had employed miners for years in driving bedrock tunnels through which the waste matter could be discharged; had expended these large sums in the preliminary work necessary for the success of this class of mining; and at the time of my visit they were receiving back part of the capital invested, and began to have hopes of seeing the current turn, and to realize on the long investment. If it was a mistake and unfair to sell these mines to them, it is certainly no fault of theirs.

From this scene of prosperity I came down to the plains, noticing as I followed the course of the rivers that the debris of the mines had filled their beds to an extent I did not have time to investigate.

On reaching Marysville I found business depressed and a general gloom over the whole community, and not without a cause; for I saw extensive and costly levees, which they had been compelled to raise to protect their homes from the encroaching waters. I was told that the citizens had been taxed 6% on their property to build these levees. I was shown where the river bed had been filled up in front of the city nearly to the cross-timbers of the long bridge. I was driven to Yuba City and down the banks of the Feather river, and shown the extensive earthworks required to save the lands from inundation. I was taken to a point where, last winter, in a fearful storm of wind and rain, the citizens turned out and fought the waters with bags of sand and shovels, plied by the strong hands of those who fought for the preservation of their homes. I was told that the evil was unbearable, and that if the town could not be relieved the citizens must desert their homes and seek others elsewhere. All the trouble was charged directly to the hydraulic mines, and injunctions had been served to stop their work. This the miners well knew, and I found them deploring what, if carried out to the bitter end, would take the bread out of their children's mouths and bring about the same stagnation in the mines that the farmers complain of in the valleys; and the parallel would be about the same, except that the farmers are in personal danger from the effects of the threatened overflows.

During my stay in the mining districts I conversed with all classes in every mine or mining town I visited.

Not only did I not hear an unkind or harsh word against the farmers, but the mining population universally expressed sympathy and admitted the hardship of the situation. At the same time they said: "We know no other trade, nor have we other means of support for ourselves and families. We have never intentionally or maliciously injured those who live below us. We have bought our lands as mining lands and we were allowed to work them by common consent, and we never thought we were injuring others until this controversy began. If the mines are stopped, what shall we do? Our winters are severe; must we let our wives and children suffer? Will Marysville and Sacramento help to support us by giving us other employment? Shall we go to San Francisco, already overpopulated and overstocked with unskilled laborers, and become idlers and non-producers?"

When I heard both sides of this most momentous and serious question, I was impressed with the thought that there was a matter which should be better understood by the people at large; that it should be made a State question, and that the people should accept as such, giving it their immediate, earnest and dispassionate consideration. The miners are uninjured if allowed to continue their work; but Marysville, the low and certain valley towns, are in great danger. If the statements made to me are not exaggerated, there is danger of a calamity in which life as well as property is threatened.

There is certainly no reason why Marysville or any other specific locality should be compelled to pay for all the work necessary to protect themselves from forces other than natural ones, and the people at these points are wholly unable to do so. They have arrived at a crisis where they must be helped, or go to the wall; and help must be extended to them at once, or it will be too late. The public do not understand this important subject sufficiently to realize the magnitude of the interests involved. The majority of the inhabitants of the State know or care very little about it. It is too often the fault of the people, even in republics, to neglect questions of public welfare, and to remain in ignorance of matters of the greatest State interest.

Hydraulic mining is comparatively short-lived, and the gold placers, which are not as extensive as generally supposed, must soon be worked out; while agriculture is eternal. It is a mistake to suppose that all the mountains can or will be washed into the valleys. The mines must in time yield to the advance of population, but mining cannot be stopped with a turn of the wrist or the dropping of a hat. Hydraulic mining is only possible in a new country. The richest hydraulic mine in the world would remain unworked if discovered in an old settled country, because those who had already acquired rights would not permit their lands to be injured by the debris. But in California the case is different. Mining rights were acquired before agriculture was thought of. These rights are not only in the hands of our people, but have been sold to foreigners, who have invested their capital in good faith, and who expect protection. On the other hand, if it can be proved that the rivers and harbors are being filled up and destroyed, and that there is no other remedy, it is clear that the placer and hydraulic mining must yield to the inevitable and stop. But even in that case, if possible, time should be given to the miners during which they could withdraw their capital and turn their attention to other pursuits. It is not going to do any good to get angry or to bear malice. The issue cannot be evaded by quibbles, but must be squarely met. It must be settled eventually in accordance with the equities of the case. But in the meantime the inhabitants of certain cities and localities must be protected, for the matter can be delayed no longer. To them delay is destruction, and perhaps death. The entire question should be referred to the best minds among us for solution, and that the matter be better understood, the best writers and thinkers should be encouraged to study the subject and to freely express their opinions through the medium of the public press. As the nation is wiser and better than the individual, so the opinions of the many are more valuable than those of the few. "Where no counsel is the people fall, but in the multitude of counselors there is safety."

Slow Combustion in Mines.

The combustion which some time ago occurred in the lower levels of the old bonanza mines appears to have never been well understood. It caused the evolution of a vast quantity of deadly gas, which spread through the lower levels of the mine and everywhere drove back the workmen; yet no fire was ever seen, nor could any one think of any means by which fire could have been communicated to the timbers in the old deserted stopes, whence the gas appeared to proceed. From the first, says the Virginia *Enterprise*, the officers of the mines were quite confident that the gas was produced by some kind of slow spontaneous combustion that was going on without either flame or fire. Indeed the gas, where most dense, would instantly extinguish a lighted candle.

As no man could live in the gas, of course no one was able to visit the seat of the combustion to see what was there going on. The opinion of those in the mines was that heat and combustion were generated in masses of timbers under great pressure, and that could one visit the spot he would find that the timbers were being charred by means of a kind of slow, black combustion—that is, that there would be no visible fire.

It was thought what was going on was somewhat of the nature of that which has taken place in the formation of beds of coal; that through great pressure a sufficient amount of heat was generated to drive great quantities of the more volatile gases out of the timbers, soften them and unite them in a solid mass resembling a stratum of coal. We have accounts of something of the same kind having occurred in mines in Europe where the conditions were far less favorable to such a result than here in the bonanza mines.

As the gas now appears to have almost ceased to be produced it is probable that in a few months our miners will be able to make explorations and seek out and examine the scene of the combustion. Such an exploration would be sure to afford matter of interest to the scientific world, and the coal, or whatever material was left behind when the combustion ceased, would be worthy of close inspection.

New Mining Machine.

The following description of a new mining machine which has been working at Snake river we take from the Blackfoot *Register:*

About three weeks ago Mr. J. R. Boyce of Omaha came to Blackfoot in charge of a machine which had been shipped to this point for the purpose of making some experiments in saving the gold from the gravel beds along Snake river. The machine was constructed in Omaha, and is patented by Messrs. Woodman and Seifkins of that city.

It is a well-known fact that the saving of the gold from the gravel beds along Snake river requires a different process than in most any other locality; at least, appliances that will work well in other places and save all the gold will not pay for mining in these beds, while an appliance that will work here will pay in almost any other place. This machine is certainly different from anything we have ever seen before, and had we not been informed as to what it was to be used for would hardly have guessed it. Its appearance is something like an immense wagon, being set on low wheels, and consists of a large wrought-iron tank, fourteen feet in length and five in width by about two in height, the bottom of which is shaped like the letter W. Above one end of this tank is a large cylinder, four feet in diameter, the length corresponding with the width of the tank. The surface is constructed of steel one-fourth of an inch thick, which is perforated, the perforation being about one-fourth of an inch wide by two inches long. About four inches outside of this is a heavy wire screen, made from No. 9 wire, and eight meshes to the inch. On the side of the steel surface is a flange placed in the shape of a screw. The gravel is thrown into this cylinder, which by revolving forces the fine sand through the meshes, while the screw-flange carries all the coarse gravel out of the opposite end of the cylinder. As the fine gravel and sand falls through the screen it drops into the tank, the bottom of which, as before stated, is like a letter W, or two V's. At the bottom of each V is a two-inch iron pipe, in each of which are 19 jets placed alternately at an angle of 10° from the center. Immediately above these pipes is a shaft running the entire length of the tank, to which are attached small paddles like the wheel of a screw propeller. The bottom and sides of the tank are lined with prepared copper plates, the plates being pressed into grooves similar to an old-fashioned washboard, there being 120 ft. surface of plates. The water is forced through the pipes with a considerable pressure; this, with the revolving screw above, keeps the water with which the tank is soon filled in constant agitation; every particle of gold is consequently almost sure to strike the plates. The water is drawn off at the top of the tank, while the fine sand and gravel, as it is forced along to the opposite end, is lifted out by a revolving wheel to which buckets are attached. It is estimated that 10 tons per hour can easily be run through the machine successfully.

When Mr. Boyce arrived here he expected to be able to use the water from the mining ditch of Judge Warrens, but the water had been shut off preparatory to enlarging the ditch. He was consequently obliged to place it in a little hollow, about half a mile from town, where the water from the small ditch running west of the town could be used. He constructed a small flume to conduct the water about 20 rods, and when secured had scarcely eight feet fall, which was hardly a sufficient force to cause the jets to discharge as intended. The gravel was also only a loose wash, and many doubted that he would find any gold at all. About 50 tons was washed, which fully demonstrated that the machine is a complete success, and showed where any improvements could be made in its construction, which was all that was desired by Mr. Boyce. Owing to the insufficient force of water, a considerable amount of sand collected in the bottom of the machine, which with a strong force can be avoided. About $5 worth of gold was taken from the plates, and from experiments made it is estimated that from $30 to $40 is contained in about two bushels of the sand which collected in the bottom. The tailings have been experimented upon, and not a color could be found, thus fully demonstrating that not a particle of gold passed out of the machine.

Mr. Boyce has returned to Omaha, well satisfied with his experiment, and will superintend the construction of machines, making any improvements that may be required, and next season we may expect to see a number of them working along Snake river.

EUREKA HOSE.—This seamless cotton hose is made in several sizes. Though it may be soaked every time it is used, having no outside covering to imprison the moisture, it will, if given a fair chance, immediately dry. Climatic influences do not affect cotton, and therefore it is particularly well adapted for use in hot countries. It can be put away for years and when called suddenly into use in case of fire, is not liable to burst.

THE Silver State learns from Supt. C. D. Rhodes, of the Humboldt Sulphur Co., that they continue to ship on an average, 100 tons of refined sulphur monthly. The mine is looking as well as it has at any time for a year or more past. About the 20th of this month the works will shut down until February, as the roads are getting bad, and it is difficult to get the sulphur to the railroad in mid-winter.

Mining Resources of Fresno.

The mineralogy of Fresno county is at present but indifferently understood. The development of the mines of Fresno county has been retarded for two reasons. The influx of immigration mostly brings those skilled in agricultural pursuits, and totally unacquainted with the arduous vocation of separating the precious metal from its spurious accompaniments. The mineral resources of Fresno county have not been thoroughly prospected. It seems to have been the sole desire and absolute aim to ascend the mountains far beyond the possibility of roads or even decent trails, and there worry out their days discovering rich lodes and veins of gold and silver that a mint of money could not develop nor thoroughly prospect. By this means the more accessible precious deposits are overlooked. The amount of gold that the San Joaquin has in the past 20 years yielded up to circulation is beyond conception. Did this gold hatch like fish from the spawn in the bed of the stream? That the region through which the river passes just before its entrance to the valley has been the chief contributor of gold is proof positive that the richer lodes and veins are far from being at the summit. Yet the prospector wends his way over this very region, while his horse's hoofs, unconsciously to the rider, hammer better ore than the greatest expectations of the rider covet. It is safe to say that the source of the introduction of gold into the San Joaquin has never been intelligently explored. That the very richest lodes exist, and will some day be discovered in this auriferous region, is plainly to be seen. There is only one river mine of importance beyond the adobe (15 miles east of Millerton), and that is of recent discovery. Messrs. Bliss of Santa Cruz, Noyes, Sivils and others of Fresno Flats, have been attempting to prospect a river claim about 20 miles east of Fresno Flats, on the north fork of the San Joaquin. My last information was that the mine was paying one cent to the pan. This was surface dirt, however, it being many feet to the ledge, where they expect to reap a rich harvest. A man can make good wages working cent dirt. An experienced hand can wash 1,000 pans per day, which brings him in $10. There is a magnificent slate range lying on the north side of the San Joaquin and west of the confluence of Fine Gold gulch with the river, that has never been thoroughly prospected, and which presents a splendid field of search and discovery. The Folsom company, who have been mining in the river since July, suspended work during the recent inclement weather, reporting a small dividend.—*Corr. Fresno Expositor.*

THE BRUNT OF THE BATTLE.—It is an unhappy mistake that the valley people make when they believe the lying lawyers' newspapers that tell them they are simply engaged in fighting with great corporations when they press the debris suits. It is really the laboring classes in the mountains who are most grievously hurt by the attacks. The wealthy owners of the mines are heavily taxed, to be sure, but still they will not be impoverished as a result of the conflict. The class who bear the brunt of this battle are the workers, the men with large families and small purses who earn their bread by the sweat of their brows; the merchants who supply the community with wares; the small mine and other property-owners who see their properties being daily reduced in value as an outcome of all this turmoil. These are the ones who sue most earnestly for compromise and who dread most the consequences if the grangers refuse to listen to the voice of peace. This is why the men, women and children of Nevada county, without an exception, have arrayed themselves on the side of the hydraulic miners, and will stay with them till victory comes. It was, it is, it will continue to be, the peoples' fight, so far as the mountains are concerned, for they have the greatest interests at stake. They know their rights, and what is more, they will protect them by every honorable means lying within their reach.—*Nevada Transcript.*

HOISTING CABLES.—Not all the steel-wire hoisting cables in use on the Comstock are manufactured in the East. Some of the best cables now in use here are made at our mines. The steel wire is brought from the Atlantic States, and the cables are constructed here on the lode. At the C. & C. shaft, we a few days since saw in process of construction, a first-class steel wire cable 2,700 ft. in length. As they themselves and their friends were liable to be lowered and hoisted on the cable, it may be guessed that no part of the work of constructing it was neglected, yet two men were able to weave 60 ft. per day. In the East, different persons might slight splices and other parts of the work, but it is safe to say that nothing is slighted at the mines. A man is not likely to slight a thing on which the integrity of his neck may soon depend.—*Virginia Enterprise.*

SAYS the Gold Hill *News:* The work now being done on the Comstock is absolutely necessary to the development of the mines. The mines are just ready for this work to be done, and it can be done cheaper in winter because of the cooler condition of the lower levels and the consequent better progress that can be made by the workmen.

ACCORDING to the *Daily American Exchange*, of New York, J. W. Gashwiler, of San Francisco, has bonded the Idaho mine, of Grass Valley, for the Paris (France) mining market.

MECHANICAL PROGRESS.

Injudicious Use of Lubricants.

There ore probobly more dollars wasted in the improper nse of lubricants as applisd to mochinory than in any othsr articls in tho supply line. Aa a rnlc, tho proprietor of a shop or monufactory buys tho cheapeat oil ho can get, regardless of the quantity it takes to prevent ths machiuery from refusing altogethsr to be set in motion. If a supply dealer goes to snch o person with a first class oil and attempts to demonstrate its good qnalities, on ioquiry is ot once raised in regard to price: "How much a gallon?" Good oil cannot be sold at as low a price as the stuff he is now nsing, so ths reply is, "don't want it; tho price is too high. Our oil costs na but 50 cts. a gallon, and givss entire satisfaction." Tho fact is, in most cases, he does not know whot the oil costs him, and only recognizss tho prics per gallon. Ho does not consider the fact that double ths quantity of poor oil is required; neither doss he consider that the weor and tear of his machinery is more thon double in consequence of nsing a poor lubricaot. The mochines havs to run with looss boxes, therefors, ths quality of work produced is inferior. If with ths boxes properly tightened, and on machiocs were tho hoxes are not odjostabls, the attempt is mode to use poor oil, the first indication the workman has that something is wrong is, ths machine coming to a dead stop, and requiring to be dosed with korosene oil ond taken apart before it can bs used again. With poor oil, as it is easy to see, much more power is required to drive ths machinery than if good oil was nssd; therefore more coal has to be consumed to supply the nccessary power to drive the engine. The helts ars overstrained, ood a less quantity of work is turned out. Ths proprietor, in the office, sees only so much monsy paid out for oil. He seems only to consider that it is all oil, and that oil is nsed for lubrication; therefore, he dctermioes to have the cheapest. If he would walk about his shop, and examioe into ths truth of the facts herein atated, he would be immensely astonished.

We visited a shop a fsw days since and saw ths eogineer runuing a 2"x7' engine ahout 400 revolutions per minute, nsing tallow, at the rate of half a gill svery 15 mioutes. He said that ths cup would not feed fast enough, so the proprietor, instead of huying a larger cup to feed a small quantity continuously, allowed his engineer to throw away tallow at an extravagant rate. The best lubricant, judiciously used, is always the cheapest.

For cutting bolts and tapping nuts, it is generally supposed that any cheap oil will aoswer, bnt ths fact is, the best oil is necessary to insure the maintenance of standard sizes and ths durability of taps and dies. Ths first cost of an article is ssldom the sonrce from which to determins its true sconomy.—*American Machinist.*

A New Patent Wood-Screw.

The manufacturs of a new patent wood-screw has been, or is about to he, started in Providence, R. I., which hids fair to give ths woodscrew combination no littls trouhle. This new screw, it is said, presents such meritorious features that it is likely to meet with a rapid sale at once. The company operates under H. A. Harvey's patsnts for rolling screws. Thess aorews ars esnecially adapted for driving into wood with a hammer, and to this end the form of the scrsw varies from that in common nse, the point being conical, without threads, while the hody of the screw is provided with threada at such a pitch that they afford no material reeistance when entering the wood, but are so formed as to hold firmly against any pressure tending to pull them ont. The head, too, is an innovation in screw making; dispensing with the nsnal slot, it has simply a couple of bosses or slots which engage as readily with the screw driver ae the elot, and yet does not detract from the strength of the head as does the former. It is said that these screws can he driven into the hardest wood without either hrcaking the wood or injuring the screw. The machinery for producing them is very ingenious in its construction. Each machine has a capacity for threading 30 to 60 acrews per minute. The company, so the report goes, will turn out 2,500 gross per day of theso new screws, which they propose to sell at auction instead of in the regular way. Whether they expect hy so doing to demoralize the market and compsl the other screw companies to huy them out, or whether they think hy this course they will better introducc their goods caunot he determined.

AN IMPROVEMENT IN WIRE ROPE.—It is well known to mining engineers that the weight of the wire rope used in deep mines is so great that every meane is adopted to lessen it. With that end in view, tho sectione nearer the hoisting cage are often made lighter, the strength of the rope being increased in proportion as it has more of its own weight to carry. A German firm H. Kern & Co., of Gleiwitz, has commenced to manufacture wire, the gange of which grows smaller the longer it is, and from this wire, A. Dsichsel, of Zabrze, is now making hoisting rope, and at the Dusseldorf exhibition showed a length of nearly 900 ft., in which the wires composing the strande were of one piece, though the weight per unit varied.

The Fontaine Locomotive.

Considerablo discussion has arisen, of loto, in regard to the performance of the "Fontaine locomotive," with its two story driving wheels. The first engine of this deacription, after undergoing what wos olaimed to be several satisfactory triols, wos sent to Cansdo and placed in active service, whers the performance, in comparison with a Baldwin locomotivo, was pronounced to hsvs made a remarkably satisfactory showing. Some few weeks since, Fontoine engine, No. 2, was put into regnlar service upon the Pennsylvania road, between New York ood Philadslphia. Various reports hovs come to hond in regard to the performaoce of this engine. One report soys: "Tho Fontains engine is a foilure—it is not suited to the Psonsylvaoia troffic." * * * "Ths sngine has been sant back to its stoblcs—the Patterson shopa." * * * "The Pennsylvania peoplo have had o look ot it and calculated the pressure nn the roils too great, if it is called npon to do anything heyood flying light."

The business managsr of the Fontaino Co. makes emphatic denial that it fails to perform proper duty, and refers to a prominsnt Pennsylvania railroad man as saying that "ths work of ths Fontaine was particularly good." That it had exceeded the performanoe of one of the best sngioes upon the road, and particularly in a loog trip from Altoona to New York, when the run was mode with the use of much lsss watsr thon is usnally requirsd. At latsst dates, however, the trials of the sngino had not besn concludsd.

A recent correspondsnt of the *Scientific American* says: "From the evidencs furnished, it seems to he ahundantly established that the Fontaino locomotive makes a long stride forward io ths dirsction of speed and economy in railway servics."

The paper above quoted in its issue of Nov. 26th, after olluding, at considerahle length, to the adverse comments upon tho performances of the engine, says: "It is sasily possihle that under ths varyiog conditions of railway service, particularly as roads are now mads, the Fontaine locomotivs may not in all respects come up to the expectation of the inventor and his friends; it may not, for instance, accomplish a speed of ninety mils. Nevertheless, what it has already dons, if human testimony is worth anything, justifies ths position taksn hy this paper, that it marks a notahle advauce in locomotive construction, and that—to repeat our own words—"if sxperience shall confirm ths premiss held out by the psrformance of ths engine now on trial," the nsw locomotivs "must materially increase ths sconomy of railway servics." As yst we have seen no adequate reason for donbtiog the probability that the future behavior of the engine will confirm the record it has already made.

Selecting Timbers.

Rankine says that thers are certain appearonces characteristic of good wood to what class sosver it helongs. In the same spscies of wood that specimsn will in geoeral be ths strongest and ths most dnrahle which has grown ths slowsst, as shown hy the uarrowness of the annular rings. The cellular tissus, as seen in ths medullary rays (when visible), should he hard and compact. Ths vascular or fibrous tissue should adhere firmly together, and should show no wooliness at a freshly cut surface; nor should it clog the teeth of ths saw with loose fibers. If ths wood is colorsd, darkness of color is in general a sigu of strsugth aud durahility. The freshly cut surface of the wood shonld be firm and shining, and should have somewhat of a translucent appearance. In wood of a given species, the heavier specimene are in general the stronger and the more lasting. Among resinous woods, those which have the least resin in their pores, and among non-resinous woods, those which have least sap or gum in them, are in general the strongest and most lasting. Timher should be free from such hlemishes as "clefts," or cracks radiating from the center; "cup shakes," or cracks which partially separate one layer from another; "upsets," wherc the fibers have heen crippled hy compression; "wind galls," or wounds in a layer of wood, which have been covered and concealed hy the growth of suhsequent layers over them; and hollow or spongy places in the center or elsewhere, indicating the commencement of decay.

HINTS ABOUT SCREWS.—When screws are driven into soft wood and suhjected to considerahle strain, they are likely to work loose; in such case, dip the screw in thick glue before inaerting. When huying screws, see that the heads are round and well cut; that there are no flaws in the body or thread part, and that they have gimlet points. A screw of good make will drive into oak as easy as othere into pine, and will endure having twice the force brought against it. When there is an article of furniture to he hastily repaired, and no glue is handy, insert a stick a little less in size than the hole for the screw and fill the rest of the cavity with powdered resin; heat the screw sufficiently to meet the resin as it is driven in.

To get a gear wheel off a shaft upon which it has been shrunk, it ie recommended to pour some melted iron around the huh, hy which operation the latter will expand so quickly that there will he no time for the shaft to get hot, and the gear will come off easily.

SCIENTIFIC PROGRESS.

What Volcanoes are Not.

"What is a volcano?" This is a familiar qnestion, often oddrsaed to us in our yonth, which "Catechisma nf Universal Knowledge" ood similar school manuals havo tanght ns to reply to in some such terms as ths following: "A volcano is a burning mountoin, from the summit of which issue smoke ond flames." This description, says Prof. Judd, is not merely incomplete and inadequate as a whole, but eaoh individual proposition of which it is mode up is grossly inadequate and, what is worss, perversely misleading. In tho first plaos, the action which takes plaos at volcanoes is not "hurning," or combustion, and beats, indeed, no relation whotover to that well-known process. Nor aro volcanoes nscessarily "mountains" at all; essntially, they are just the reverss—namsly, holes in the earth'a crust, or outer portion, hy msans of which a communication is kept up hetween the surfaos ond the interior of our globs. When mountains do exist at conters of volcsnic activity, thsy are simply ths heaps of materials thrownout of thess holes, and must, therefors, he regarded not os ths canses but as the consequences of volcanic action. Nsither does this action always take placo at the "summits" of volcanic mountains when such exist, for eruptions occur quito os frsquntly on their sides or at their hase. That, too, which popular fancy regards as "smoks" is really condsnsing steam or watsry vaper, and ths supposed raging "flames" are nothing more than the glowiog light of a mass of melten material reflected from these vapor-clouds.

Ths nams of volcano has been horrowed from ths mountain Vulcano, in ths Lipari islands, where ths ancients bslisved that Hephaestus, or Vulcan, had his forge. Volcanic phenomsna have been at all times regarded with a superstitious awe, which has resulted in ths gensration of such myths as the one just mentioned, or of that in which Etna was said to have been formed by the mountains under which an angry god had huried the rshellious Typhoo. Thess stories changed their form, hut not their essence, under a Christian dispensation, and Vulcano became regarded as the plaos of punishment of ths Arian Emperor Theodosius, and Etna as that of Anne Bolsyn, who had sinned by psrverting the faith of King Henry VIII.—*From "Volcanoes, their Action and Distribution," in Popular Science Monthly.*

CURIOUS EXPERIMENT IN CRYSTALIZATION.—The following experimsnt is given hy Peligot in *La Nature:* Dissolve 150 parts hy weight of hyposulpate of soda in 15 parts of boiling water, and gently pour it into a test tuhs so as to half fill it, keeping the solntion warm hy placiog the glass in hot water. Dissolve 100 parts by wsight of acetats of soda in 15 parts of hot water, and carefully pour it into ths sams glass; the latter will form a laysr on the surface of ths former and will not mix with it. When cool thers will be two supersaturated solutions. If a crystal of hyposulphate of soda hs attachsd to a thrsad and carefully passed into the glass, it will traverse the acetats solution without disturhing it, but on reaching the hyposulphats solution will causs the lattsr to crystalizs at onos in large rhomboidal prisms with ohlique terminal facss. When the lower solution is completely crystalized, a crystal of acetate of soda similarly lowered into the upper solution will cause it to crystalize in ohlique rhomboidal prisms. Ths appearance of two different kinds of crystals will not fail to surprise those not acquainted with such experiments.

SCIENCE IN AGRICULTURE.—The last 20 years have witnessed a great change in the relations hetween science and agriculture. The great improvements in cultivation and farm management are the results of sound reasoning combined with arithmetical calculation, in regard to work on the farm, which rapidly is taking tho place of the old-time "rule of thumh" so closely adhered to hy the unprogressive. In Germany, hetween 100 and 200 chemists and physiologists are smployed in not far from 90 experiment stations and other institutions in studying the perplexing problems of farm science. In every European country, excepting Turkey and Portugal, this work is said to he going on. Neither is America hehind the times. There are various agricultural colleges in the United States and Canads, which devote especial attention to these inquiries, whose work ie supplemented ably hy work in medical colleges and hy private investigation.

STILL ANOTHER COMET.—Director Swift, of the Warner Observatory, has discovered a faint comet in the constellation Cassiopea. It is possihle that the stranger is the comet of 1812, which was expected to appear in the north. The comet is in the line hetween Polaris and the Great Cluster in Pereeus, a little nearer to Polaris. This is the seventh comet discovered since January.

MODIFICATION OF RUHMKORFF'S COIL.—With an induced coil, arranged in two hlocks placed on the poles of the magnetic nucleue and communicating with sach other, so that their points of junction may he at eqnal distances from the nucleus, effects are ohtained of much greater powsr than with the ordinary arrangement.—*Les Mondes.*

THE LATE TRANSIT OF MERCURY.—Ws learn that very successful observations of ths late transit of Meronry were taken at Honolulu. C. H. Rockwell, of Tarrytown, N. Y., the astronomsr who went to Honolulu to observs the transit of Mercury on the 7th nlt., returnsd to this city by the *Zealandia*, ond reports his obsservatioos as having bsen highly successfnl. Ths phenomena of the transits of the infsrior planets, Venus and Mercnry, across ths disk nf the sun aro always looked for with great interest by astronomers as enahling them to test the accuracy of their tohles, and to bring their theories face to face with actuol facts. Ths object of these observations is to learn with increased accuracy the relative distances of the plonets from eseh other aod from the sun, which is technically known os determining the solar parallax. The distance in latituds between two points from which observations of a transit ors mads servos as a hass lins to calculate the diffsrcnes of position between the parallels on which the planet is seen projected on the disk of the sun. The valns of theso observations of Mercury is much less than ths corrsponding observations of Venus, for tho rsason that tho smaller planet is ncarer to the sun than to us, and the long leg of ths triangls is on our side, whereas with Venus ths oooditions are rsversed, the distanco from the sun to tho larger plonst heing abont two and a half times as grsst as our distanos from the plonst, and tho chances of error in observations are dimiuished in this proportion.

A NEW SPECIES OF HORSE.—The *Annals and Magazine of Natural History* for July contains a translation of a Russian paper, in which M. Poliakof hrings forward a mass of evidencs in proof of ths sxistenes of a hitherto unknown species of horss not far from Zaisan, in Cantral Asia. The animal appears to rsssmhle a small domestic horss, of a dun color; its hcad is large in proportion to the sizs of ths animal; and the root of its tail is destitute of long hair for some distance. M. Poliakof names his supposed new species *Equus Przewalskii*, in honor of ths travsler who brought the skin to Russia. He regards it as a trus horse, and rsmarks that "if it were possihls to prove that culture influenced the growth of the tail, and that this hecame mors hairy, and the mons longsr, under altered conditions of life," it might he affirmed that "it was indeed the animal whoss ancestora wers reclaimed by man in the stone period, the so-called domestic horse of our day."

RADIANT MATTER.—Father Serpieri aud Prof. Riglio have published, in the *Revista Scientifico-Industriale*, some of their observations upon Crookes' apparatus. Ferrini has rspeated ths sxperiments and published tho following theory: On account of tho very great resistance which, as Hittorf has shown, is produced under the influence of a great rarefaction around the cathode, there arises a powerful induction, and the phosphorescencs of ths walls of the globs indicates thsir intersection with tho lines of force of the electric field, which is most neatly circumscrihed where those lines are the most snergetic. The gaseous molecules arrange thsmselves along these lines while transmitting electricity. The blus pencil, which corresponds to the most intense portion of ths slectric field, represents a continuous discharge bstwesn the cathods and the glass which is in front of it.—*La Lumiere Electrique.*

DUST EXPLOSIVES.—Dust mixsd with air is a dangerous explosivs. If a largs log of wood were ignitsd it might he a wesk bsfore it would bs entirely consumed. Split it up into cordwood and pils it np loossly and it would hurn in two hours. Split it np into kindling wood, pile it up loosely, and perhaps it would burn in less than an honr. Cut it into shavings and allow a strong wind to throw thom into the air, or in any way keep the chipe comparatively well separated from each other, and the log would perhape he consumed in two or three minntes; or, finally, grind it up into fine dust or powder, hlow it in such a manner that each particle ie eurrounded by air, and it would burn in less than a second.

A CURIOUS FACT.—Dr. Lewis Balch, of Albany, in a review of the medical evidence in the celebrated Billings murder case, alludes to the curious fact that a hall of a given calibre fired through glass may make a hole enough smaller than the full size of the hall hefore firing to prevent an unfired hall of like calibre passing. Dr. Balch notes having seen "a base hall, thrown with great force and having a rotary twist, make a round hole through an ordinary window light, and when the hall was tried to he again passed through the same opening the hole was nearly one-third too small."

IRIDIUM is many times hardsr than the hardest steel, and will not rust or corrode in any atmosphere or fluid. It defies the file and resists all acids. The only means of cutting iridium ie by friction with a soft metal wheel charged with diamond dust or fine corrundum.

THE great Vienna telescope just constructed is now the largest refracting telescope in the world. Its aperture of 20 inches exceeds by one inch that of the Naval observatory instrument at Washington. It is 33 ft. 6 inches long, the mounting is very superior, and the large and impoeing observatory is well located.

SILVER is the most perfect reflecting metal, absorhing less than three per cent. of the rays of light.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Nov. 17.		Week Ending Nov. 25.		Week Ending Dec. 1.		Week Ending Dec. 8.	
Alpha	3.55	3½	....	....	2.90	2⅝	3	2½
Alta	4.80	4½	4.80	4.15	4.55	4.10	4.90	3⅝
Andes	1.60	1⅛	1.35	1	1.20	1	1.30	1
Albion	2.40	1.85	2	1 90	1.95	1⅛	1.95	1.30
Argenta	....	....	10c	....	....	....	....	....
Addenda	10c	....	5c	....	....	....	....	....
Belcher	3.35	3.05	3	2.15	2.55	2.10	2½	1.60
Belmont	....	....	30c	....	....	....	40c	35c
Best & Belcher	11⅜	9⅜	9⅝	8⅜	8	8	9¼	7¼
Bullion	1.65	1⅛	1⅛	1	1¼	1.15	1.30	1.20
Bechtel	50c	....	50c	45c	45c	25c	45c	25c
Belle Isle	20c	....	15c	10c	15c	....	....	....
Bodie	7⅜	5⅜	5½	4⅜	4.60	4½	4½	3½
Benton	95c	75c	90c	....	85c	75c	90c	70c
Bulwer	....	....	....	....	2½	2.30	3	....
Boston	25c	....	....	....	15c	....	....	....
Black Hawk	10c	....	5c	....	5c	....	5c	....
Belvidere	....	....	25c	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	35c	25c	35c	25c	25c	20c	25c	10c
California	75c	65c	65c	45c	55c	50c	65c	45c
Challenge	70c	....	70c	....	65c	....	70c	50c
Chollar	2	1.70	1.65	1.4⅛	1.65	1.45	1⅞	1⅞
Confidence	3.10	3	3.10	2	2.40	2.2⅛	2½	2
Con Imperial	20c	15c	15c	10c	15c	10c	10c	....
Con Virginia	2.30	2.15	2.10	1.8⅛	1⅞	1⅛	1.90	1½
Crown Point	2.10	1⅞	1.85	1⅛	1.40	1.1⅛	1.35	1
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1⅛	....	1⅛	1.0⅝	1⅛	1.1⅝	1⅛	1
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	20c	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1.90	1.85	1.90	....	1.90	1.85	2.00	2.40
E. Mt. Diablo	35c	30c	40c	25c	60c	40c	60c	50c
Eureka Con	17⅛	16⅛	17⅞	17	16⅛	16	15⅛	14
Exchequer	1.40	1⅛	1⅛	1	1.20	1.05	1.10	1
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	40c	20c	25c	20c
Golden Gate	2½	2⅛	2⅛	2⅛	2⅛	2⅛	2⅜	2.40
Goodshaw	50c	35c	50c	45c	55c	40c	40c	....
Gould & Curry	6⅜	5⅞	5⅝	5⅜	6⅜	5⅜	6⅜	5
Hale & Norcross	3.55	3	3.05	2.7⅛	3	2.60	2.95	2.15
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	15c	....	....	....	....	....	....	....
Julia	30c	....	25c	15c	20c	10c	25c	20c
Justice	1	65c	85c	65c	80c	60c	75c	60c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2½	....	2½	2	....	....	1½	1
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	15c	....	15c	....	20c	15c	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	1½	75c	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2	....	2	1.90	2	....	2	....
Martin White	3	....	2	....	....	....	3	....
McClinton	....	....	....	....	....	....	....	....
Mono	2½	2	1.80	1.35	1.40	1.30	1.90	90c
Mexican	9⅞	8	7	7	9⅜	7	12	9⅜
Mt. Diablo	5⅝	....	6⅛	5⅛	6⅜	6	6⅜	6⅜
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	35c	30c	40c	25c	50c	40c	50c	35c
New York	20c	....	....	....	5c	....	5c	....
Northern Belle	13⅛	12⅜	12⅛	10⅛	11⅞	11⅛	11⅛	10⅛
North Noonday	10c	....	10c	5c	30c	25c	35c	....
Navajo	....	....	....	....	....	....	....	....
Occidental	1⅛	1	1.35	1.05	15c	....	1	....
Ophir	7⅜	6⅜	6⅜	6	6⅜	5⅜	7⅜	6
Original Keystone	....	....	....	....	....	....	....	....
Overman	2.90	2.45	2.95	1⅞	2.20	1.85	2.15	1.55
Oro	35c	25c	20c	....	25c	20c	25c	20c
Paris	....	....	....	....	....	....	....	....
Potosi	1.95	1.70	1.55	1.45	1.60	1.40	1.60	1
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	10c	....	....	....	20c	5c	30c	....
Savage	3⅛	2.85	3.15	2.80	3.05	2.80	3⅛	2.80
Seg Belcher	8⅛	7⅛	8	....	6⅛	....	6⅝	5
Sierra Nevada	14⅜	11⅞	11⅞	9⅛	11⅛	9⅜	11⅞	9⅜
Silver Hill	25c	15c	20c	15c	20c	10c	25c	20c
Silver King	19⅛	....	20	19⅜	19⅛	19⅛	20	19⅛
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	1⅛	1.20	1.30	1.05	1.40	1.10	1.45	1
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	30c	25c	30c	20c	15c	....	20c	15c
Tioga Con	25c	....	10c	10c	....	....	10c	....
Tiptop	5⅞	....	5⅞	....	5⅛	5	5⅝	5
Tuscarora	....	....	20c	....	....	....	....	....
Union Con	13⅛	10⅞	11	9⅛	14⅜	9⅛	15⅛	13⅜
Utah	8⅛	6⅞	7⅞	7	8	6⅞	8⅛	6⅞
Ward	....	....	3	....	....	....	3.60	3
Wales	75c	....	....	....	75c	....	....	....
Yellow Jacket	5⅞	4.20	4.40	3.30	3.95	3.30	4⅛	3.40

Sales at S. F. Stock Exchange.

Thursday A. M., Dec. 8.

25	Alaha	300	Golden Gate..21
355	Alta..3.85@3.90	420	Hale & Nor...2.20@2.15
425	Andes...1@1.05	615	Justice..60c
225	B & Belcher.....7@7⅞	100	Julia..20c
400	Belcher..1.65	100	Kentuck..1
40	Bullion..1.20	200	Mexican..9⅛@9⅜
580	Benton..70c	480	Ophir..6⅞@7
400	Crown Point..1.10@1.05	560	Overman..1.60@1.55
800	Con Imperial..10c	1005	Potosi..1.10@1
250	Caledonia..10c	600	Regent..1⅛@1.70
130	Confidence..2	530	Savage..2.80@2.85
665	California..45c	325	Sierra Nevada..9⅛@9⅜
600	Con Virginia..1.55	10	Seg Belcher..5
310	Chollar..1.1@1.90	500	Silver Hill..21c
230	Challenge..50c	330	Scorpion..1@1.05
190	Exchequer..1	255	Utah..6⅞@6⅞
450	Gould & Curry..5	635	Union..13⅛@13⅜
		70	Ward..3.60
		100	Yellow Jacket..3.40

Bullion Shipments.

We quote shipments since onr last, and shall be pleased to receive further reports:

Standard Con., Nov. 28th, $65,834; Contention Con., 28th, $14,308; Northern Belle, 28th, $6,866; Star, 28th, $3,713; Hanauer, 29th, 2,160; Enreka, 29th, $1,320; Nevada, 29th, $1,165; Horn Silver, 29th, $7,500; Barbee & Walker, 29th, $1,638; Wood River, Dec. 4th, $2,870; Hanauer, 4th, $2,335; Stormont, 4th, $6,685; Horn Silver, 3d, $20,000; Barbee & Walker, 3d, $1,641; Horn Silver, 2d, $25,000; Wood River, 2d, $2,635; Hanauer, 2, $2,310; Wood River, 1st, $6,655; from Silver Reef district, Utah, for November, $79,639.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Napoleon M. Co., Dec. 2. Location, Placer Co. Cal Capital stock, $10,000,000. Directors—Alexander Badlam, Alexander Weed, Holland Smith, J. Haley and Thos. P. Hayes.

San Bernardino Lumber and Fluma Co., Dec. 2. Location, San Bernardino, Cal. Capital stock, $1,000,000. Directors—Charles F. Burnham, John T. Bradley, Samuel W. Pratt, Dwight Whitney and Samuel Locke.

Limestone Channel Gravel M. Ca., Dec. 7. Location, Butte Co. Capital stock, $5,000,000. Directors—George W. Lovejoy, D. K. Perkins, James Ireland, Charles E. Corbiere, E. Von Hasslocher.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Albion Con M Co	Nevada	9	30 Nov 25	Dec 29	Jan 19	D B Chisholm	327 Pine st
Alexander M Co	Nevada	1	3 00 Oct 31	Dec 3	Dec 21	A B Cooper	328 Montgomery st
Betty O'Neal M Co	Nevada	2	25 Nov 14	Dec 19	Jan 5	R W Heath	318 Pine st
Belmont M Co	Nevada	30	15 Nov 11	Dec 19	Jan 16	J W Pew	310 Pine st
Bodie Con M Co	California	1	50 Dec 6	Jan 14	Feb 13	W H Lent	309 Montgomery st
Bechtel Con M Co	California	8	25 Dec 3	Jan 9	Jan 30	W H Lent	309 Montgomery st
Black Hawk G M Ca	California	13	10 Nov 9	Dec 17	Jan 4	H A Charles	419 California st
Bonanza M Co	Nevada	1	15 Oct 31	Dec 3	Dec 20	J B Treadwell	404 California st
Bodie Tunnel & M Co	California	5	50 Oct 20	Nov 24	Dec 21	O C Harvey	304 California st
Caledonia S M Co	Nevada	38	25 Dec 6	Jan 7	Jan 26	R Wegener	414 California st
Holmes M Co	Nevada	3	10 Nov 8	Dec 12	Jan 3	E A Holmes	318 Pine st
Kentuck M Co	Nevada	17	30 Nov 23	Jan 3	Jan 23	J W Pew	310 Pine st
Lady Bryan S M Co	Nevada	6	25 Dec 5	Jan 10	Jan 29	C V D Hubbard	310 Pine st
Lord of Lorn M Co	Nevada	2	10 Oct 8	Nov 17	Dec 19	R N Van Brunt	318 Pine st
Mono G M Co	California	15	50 Dec 5	Jan 10	Jan 31	W H Lent	309 Montgomery st
Morning Star M Co	Nevada	1	25 Oct 19	Nov 22	Dec 21	J B Moholm	331 Montgomery st
Mt Potosi M Co	Nevada	8	25 Oct 20	Nov 21	Dec 12	W J Taylor	330 Pine st
North Noonday M Co	California	4	25 Oct 26	Dec 1	Dec 23	W J Taylor	330 Pine st
Noonday M Co	California	4	25 Oct 26	Nov 23	Dec 20	W J Taylor	330 Pine st
Nor h Standard G & S M Co	Oal	2	10 Nov 30	Jan 3	Jan 21	C V D Hubbard	310 Pine st
Oro M Co	California	10	10 Nov 16	Dec 17	Jan 4	W Stuart	320 Sansome st
Original Keystone S M Oa	Nevada	5	25 Nov 29	Jan 3	Jan 25	F E Luty	330 Pine st
Pinal Con M Ca	Arizona	1	25 Nov 19	Dec 27	Jan 16	W W Traylor	309 Montgomery st
Potosi M Co	Nevada	7	50 Nov 11	Dec 14	Jan 4	W F Dean	309 Montgomery st
Savage M Co	Nevada	48	10 Nov 3	Dec 6	Dec 27	F B Holmes	329 Montgomery st
Seg Belcher M Co	Nevada	20	1 00 Dec 5	Jan 6	Jan 25	G D Edwards	414 California st
Tuscarora M & M Co	Nevada	9	15 Oct 17	Nov 22	Dec 14	M E Sperling	309 California st
Yellow Jacket S M Co	Nevada	42	1 00 Oct 4	Nov 9	Dec 13	M Otey	

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Buckeye M Co	California	4	50 Nov 10	Dec 19	Jan 19	W H Lowden	213 Sansome st
El Dorado W & M Co	California	19	75 Nov 12	Dec 22	Jan 16	R M Welch	524 Sacramento st.
Golden Fleeca Gr M Co	California	23	40 00 Oct 23	Nov 30	Dec 19	F Schinnier	735 Folsom st
Home G M Co	California	8	3 Oct 20	Dec 3	Dec 21	R Filon	330 Pine st
Horseshoe M Co	Arizona	1	62 Nov 30	Jan 4	Jan 23	J H Sayra	330 Pine st
Iowa M Co	Nevada	15	05 Nav 9	Dec 17	Jan 5	C C Leavett	411½ California st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Badrock M Co	——	C H Graves	6 Post st	Annual	Dec 15
Cataract and Wide West Gr M Co	Cal	W B Lake	240 Montgomery st	Special	Dec 15
Gould & Curry S M Co	Nevada	A K Durhrow	309 Montgomery st	Annual	Dec 13
Hillside M & M Co	Nevada	F Frankenthal	330 Pine st	Annual	Dec 15
Mayflower S M Co	California	H C Boyd	240 Montgomery st	Annual	Dec 21
Mt Diablo M & M Co	California	R W Heath	318 Pine st	Annual	Dec 19
Ophir S M Co	Nevada	C L McCoy	309 Montgomery st	Annual	Dec 21
Winthrop M Co	——	H Wright	410 Front st	Annual	Dec 12

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	California	W Letts Oliver	—— ——	20	Nov 19
Bulwer Con M Co	California	W Willis	303 Montgomery st	10	Dec 12
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	60	Sept 27
Father De Smet M Co	Dakota	H Dean	New York	50	Oct 10
Northern Belle M & M Co	Oal	Wm Willis	309 Montgomery st	50	Nov 15
Northern Belle M & M Ca	California	Wm Willis	309 Montgomery st	25	Nov 15
Silver King M Co	Arizona	J Nash	315 California st	25	Dec 15
Standard Con M Ca	California	Wm Willis	309 Montgomery st	75	Dec 12
Western M Co	California	C S Curtiss	309 Mo ntgomery st	75	Nov 10

The Mining Share Market.

Our stock tables show what the fluctuations in the share market have been. Sales are rather light, though there is some little revival of the interest in many stocks..

Assessments levied by 22 mining companies become delinquent during the current month, the aggregate amount called for being $380,150, the smallest of any monthly aggregate during the year 1881. Of the assessments levied $269,500 is on account of Nevada mines, $80,650 on account of California mines, and $30,000 on account of Arizona mines. During the year 1881 the various mining companies have levied 364 assessments, aggregating $9,385,160.

The usual monthly cash balance statements have been issued, the following being those of the principal companies with cash on hand:

Alta, $15,328.48; Alpha, $693; Argenta, $1,343.21; Bullion, $12,710.43; Bulwer Con., $100,636 74; Benton Con., $18 296 03; Bechtel, $4,048.37; Belcher, $63,853.44; Belle Isle, $922 21; Belding, $903.82; Con. Virginia, $20,327.10; Crown Point, $21,316 17; Chollar, $7,523.98; Challenge, $372.67; Contention, $83,540.92; Exchequer, $13 020; Geo. Jackson, $6,536.34; Justice, $25,877.44; Lady Washington, $2,294 16; Mono, $8,853 48; Mexican, $47,931.56; N. B. Isle, $12 621.97; N. Belle, $66,638 65; Overman, $24 957.60; Occidental, $8,019.92; Ophir, $51,541.67; Standard, $397,085 88; Saratoga, $7,714 94; S. Nevada, $17.605 04; S. Hill, $11,952 46; Utah, $18,940.99.

The following had an indebtedness Dec. 1st: Bodie Con, $8 055 05; Best & Belcher, $9,031 64; Betty O'Neal, $2,018.08; Caledonia, $13,881.46; California, $38,234 00; Day, $69,493.28; Gould & Curry, $12,783.80; Grand Prize, $28,000; Holmes, $1,822.18; Hale & Norcross, $17,479.83; Imperial, $846.90; Independence, $7,261 34; Mt. Diablo, $7,823.65; Potosi, $18,036.81.

The old officers of the Mexican mining company have been re-elected for the ensuing year. The superintendent concludes his annual report with the following: "I will state, as our work during the past year has been almost exclusively devoted to reaching our 2700 and 2900 levels, the work of the coming year will be applied to opening up and exploring those levels. Although nothing of value has yet been exposed, the character and extent of the vein matter already passed through in our drifts and drill holes, and the vast amount of ground yet unexplored, give great encouragement for the development of something of value during the coming year."

Reports from Sweetwater mining district are very encouraging, and there is likely to be a flourishing camp at that point next summer. There are now 20 miners at work in the Summers mine, besides a number of men working on other claims in the district. Many of the claims are showing up good ore. The carpenters are at work on the mill building.

Colorado is expected to produce from $22,000,000 to $25,000,000 in bullion for the year 1881.

Lewis District.

A correspondent of the Virginia *Enterprise*, writing from Lewis, says:

Lewis is situated in the mountains, 18 miles from Battle Mountain. It is not a new camp, the first mill having been built here some nine or ten years ago, but it is only in the last year that any notice has been taken of the place.

There are three towns, Upper, Middle and Lower Lewis. In the upper and middle towns are situated the Star and Grove, Highland Chief, Dahlgreen, Chloride, Morning Star and Eagle mines. These are the principal mines of the district, and are owned and controlled by New York capitalists, represented by G. W. Bothwell, who is Superintendent of the mines and mills. The lower town is where most of the residences are situated, and where the business is done. It has quite a lively appearance at present, owing to a good many men being out of work.

There are two 15-stamp mills here, the Eagle and Star and Grove. The Star and Grove mill is about worn out, and will shortly be turned into a foundry. The Eagle mill works steadily, and has just finished a run on Betty O'Neal ore.

There is also nearly completed a large 40-stamp mill. It is provided with roasters, and is one of the most complete of its kind on the coast. The builders are Messrs. Beckett & McDowell of New York. Their agent is J. P. Courter. The same parties are also grading for a 10-stamp mill for the Dahlgreen company.

Half a mile to the south of the town is located the Betty O'Neal mine. It is the only mine in the camp that is owned by San Francisco parties. The Superintendent is John C. Schmitt, formerly of the Lady Bryan mine, Virginia.

At present the place is somewhat overdone. There are a good many more men here than there is work for, and it is a very good place to stay away from. The wages are $4 per day of 10 hours. The mines are wet and very cold.

Lewis may in the future turn out to be a good place, but it will not be till the management is in the hands of three or four companies. A mining camp can never amount to very much while one company controls everything.

A Quarterly dividend of $2.50 per share, amounting to $135,000, was paid by the Richmond Con. M Co. at London on the 8th of November. This is a Nevada mine, near the Eureka Con. This company has paid $3,502,600 in dividends to date, while the Eureka Con. has paid $4,680,000. The last named suspended dividends in October, 1881, and it will be some months before they are renewed.

The Vizina Con. M Co. of Tombstone produced $213,300 during the three months ending Nov. 1st. It is said that the mine is capable of doing still better than this. The first dividend of $10,000 was paid on the 1st of November.

The Jocuistita Mining Co. has declared its second dividend of $1 per share, amounting to $100,000, payable at New York on the 30th of November. This makes $200,000, and a surplus of $376,000 is carried forward.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

Isabelle.—Mr. Lewis Chalmers, managing director of the Isabella Company, is hard at work at the mines, and has 4 teams on the road hauling rich ore to the mill, which it is expected he will start up in a few days, all the new machinery being in, the mill hands engaged and ready to commence when Mr. Stewart, of the Hunt, Douglas & Stewart process, (which Mr. Chalmers has adopted for the treatment of his ore) has got everything in order for steady work. There is an abundance of ore, we understand, at the mine, to keep the mill running to its full capacity, and if the weather keeps moderate, to permit regular hauling, bullion shipments will be made without interruption.

AMADOR.

Drytown Items.—The Potosi mine under the management of Digory Hobbs, is panning out well, and the 10-stamp mill is kept constantly running. In the Maryland mine they have finished their 400-ft shaft and commenced drifting. The Seaton Con. ore working in the old Seaton tunnel, with good rock in sight. The last crushing of this rock in the old Bonanza mill paid $6.75 per ton. The Co. under the management of D. T. Davies, are erecting a 20-stamp mill on the ground. The Phœnix reduction works of this place, under the management of E. C. Voorbies, of Sutter Creek, resumed operations this week.

CALAVERAS.

Glencoe Items.—Calaveras *Chronicle*, Dec. 3: The Norwich mill has been running steadily since repairs were made. The outlook in the mine is healthy. The Valentine mill stopped to clean up. Rumor has it that its stamps are hung up for an indefinite time. The gist of the matter seam to be that the new owners based their calculations entirely upon supposed average assays of the ore in the mine, but the product of the mill did not correspond. The principal cause of disappointment is beyond doubt, that the mine, after having been gouged by previous owners, had not been developed to insure a fair trial. Work in the mine is going on as usual. The upper tunnel of the Glencoe is still being extended. The ore looks well and is 7 ft wide. No hanging wall in sight. Lewis & Fairchild are still stoping specimen ore. Quite an unusual number of mining operators were cruising around here last week. A number of the Chinamen were given notice to leave this district.

EL DORADO.

The Morey Mine.—*Mountain Democrat*, Dec. 3: Last Thursday O. H. Spencer, one of the proprietors of the Morey mine, near Grizzly flat, came down on his way to San Francisco, bearing with him a sack full of ore recently extracted from that mine. The samples were of good size, ranging from 15 to 25 lbs. in weight; all were streaked with sulphuret seams, showed considerable free gold, and were estimated to be good for at least $15 per ton by ordinary mill process. They were taken from the face of a drift which has been run 15 ft southward on the 104-ft level in the Morey mine. A similar drift is being run to the northward, with encouraging prospects. In the south drift a "horse" was encountered at the outset, which cut out nearly all the quartz, but after drifting about 10 ft they got through it, and now they have about 3½ ft of quartz between the walls, which are about 6 ft apart, and a vein about 25 inches thick, next the east wall, is of the character of the samples brought down by Mr. Spencer. He and his partners are highly elated with their prospects.

Bullion.—Last Thursday evening, escorted by an armed body-guard, Supt. Aldersley brought over the bullion realized from the clean-up made at the Bowlder mine that day. They had made a 20-days' run, had crushed something over 400 tons of rock, which paid handsomely; far beyond their expectations. This crushing came from a body of quartz near the east wall, about 20 ft thick and very rich. There is a large body of it so located that it can be broken down and delivered at the mill at a cost not exceeding 40 cents per ton, which leaves nearly all the product for clear profit. In the Bowlder and Gopher claims there are tens of thousands of tons of ore above the level of the mill and within a few hundred yards of it.

The Benfeldt Mine.—Fred Benfeldt, at his fine gravel mine near Smith's flat, made another clean-up a few days ago. During the run he took out and crushed 2,020 carloads of gravel, from which he realized $4 353, without cleaning up the sluices, in which he estimates that there is not less than $150, and probably $300 or more. He has a very large block of this quality of gravel in sight. The Benfeldt is a very good mine.

INYO.

Defiance Booming.—Bodie *Free Press*, Dec. 4: The Defiance mine at Darwin, of which Mr. P. Reddy is the principal owner, is now working with a force of 25 men. Mr. Reddy once sunk a fortune in this mine, but has never lost confidence in it, and is now going to pull his fortune out of it again.

MARIPOSA.

Coulterville.—Mariposa *Herald*, Dec. 2: Work on the various mines in this vicinity is still progressing. Good developments in this line may soon be expected.

Red Bank.—Mariposa *Gazette*, Dec. 3: The Merced Hydraulic M. Co. have, this week, completed the reservoir and ditch on Flyaway Gulch, which doubles the amount of water formerly had on the Red Bank. The Scott Gulch reservoir and ditch will be completed in a few days. Also the new tail flume, which is 5 ft deeper than it was last year. The work of setting the new pipe and giant has been commenced. With 2 lines of pipe and 2 giants, the 2 past years hydraulicing already in the pits, will be largely added to by this winter's work, which altogether will undoubtedly make a big clean up in the spring. The new pipe amounts to 600 ft in length.

NEVADA.

Shipment of Gold.—Nevada *Transcript*, Dec 3: The total sum of $90,536 was shipped to San Francisco, through Wells, Fargo & Co's. office in this city, during the month of November. Most of this gold was obtained from the quartz mines in this immediate vicinity, and in fact but a small proportion of it came from gravel mines, and not a dollar of it from any mine that has been injuncted. It will be seen that the shipmeuts are decreasing on account of the foolishness on the part of the farmers. The gold that is taken out in the upper part of the county is never added to that which is taken out around here. It passes through Wells, Fargo and Co's office here and is simply checked on the books, the offices in the country receiving credit therefor.

A Ledge of Rich Quartz Struck.—Messrs. L. O. Keith, Sime Johnson and Wm. Irwin are the owners of a quartz claim situated on Little Deer creek, about a half mile from Charannot's house on Canada hill. The claims were located about one year ago from the discovery of a stringer of quartz on the surface which gave favorable indications, and a shaft was put down. A few tons of quartz were taken out, which more than paid expenses, but having worked down to water level, and the owners not being in a financial condition just then to erect hoisting works, further development at the claim was suspended. Last July operations were resumed, hoisting works erected, and an incline sunk to the depth of 100 ft. This occupied until about two weeks ago, when drifts were commenced to be run north and south. Thursday morning the north drift which had been run a distance of 21 ft, struck a quartz ledge about three inches thick, which by sun down had widened out to a strong foot. The quartz is of bluish cast, known as ribbon rock, solid and firm, showing an abundance of free gold, and is heavily

charged with sulphurets. Were the whole body of ore as rich as specimens exhibited us, the rock would average several hundred dollars per ton; but from $30 to $100 per ton is a low estimate to put the yield, at mill process.

Five men have been employed since the work was resumed in running drifts, but it is the intention to double the force of miners and develop the rich body of ore that has just been brought to light. The mine is under the superintendence of Mr. Henry Richards, to whom is due in a great measure the credit of striking the lode at so early a time in running the drifts, by his judgment in locating the pitch and angles of the ledge.

PLACER.

THE IRON CO.—Placer *Argus*, Dec. 3: The California Iron Co.'s works at Hotaling, (which is the postoffice lately established at the new settlement near Clipper Gap), are running on full time, and turning out about 30 tons of very good pig iron per day. The 6 new charcoal furnaces were put into requisition for the first time last Monday. Such occasional temporary stoppages, as that lately reported, where the works were closed down for three days, will be of less frequent occurrence hereafter, it is believed. Supt. White tells us that everything is working well and satisfactorily.

THE LINCOLN COAL MINE.—Placer *Herald*, Dec. 3: The coal mine on the old Cook place near Lincoln, recently purchased by Landes, of Wheatland, has been thoroughly re opened and is being run steadily. Much coal is being taken out, and much of it is of a superior quality. Mr. Gates informs us that he tried some recently in an ordinary cook stove and was surprised at the amount of heat it gave out. In the cities where fuel is high, it would seem that with suitable stoves this coal might be used to great advantage, from an economical standpoint.

THE ROCKY POINT.—The Rocky Point M. Co., whose works are located a few miles above Auburn, on the Middle Fork of the American river, are putting in full time prospecting their claim, working day and night. Some paying gravel has been taken out of this mine, and it is hoped when well opened they will strike it not only rich but extensive.

THE HYDRAULIC ELEVATOR.—The hydraulic elevator in operation on the Middle Fork of the American river, report says, works like a charm, and the gravel which they are washing from the bed of the river is paying equal to the expectation of the proprietors. A means for getting at the gravel in the beds of our mountain rivers, where fall is lacking, has long been desired. The hydraulic elevator promises to successfully furnish that means.

PLUMAS.

TEMPORARILY SUSPENDED.—Greenville *Bulletin*, Nov. 30: In order to complete the new hoisting works at the Indian Valley mine, all other work has to be temporarily suspended. As soon as the machinery is ready, the hoisting of ore from the shaft will be begun; there is plenty of it in sight. The work is progressing rapidly and all will be fully ready in 3 weeks.

THE PROSPECT lately struck by Batcheider & Wing is turning out even better than was expected. The rock is now being crushed in a small mill in Dixie canyon, and is said to be yielding $40 a ton as far as worked. The claim is just below the old works of the Green Mountain and is supposed to be a slide from that great mine.

Mr. J. B. Scott, of the Southern Eureka, has purchased a controlling interest in the Taylor-Plumas mine, and has been elected President.

NO REASON FOR DECLINE.—There has lately been a heavy decline in the value of mining shares at the New York Stock Board. Why there should be any decline at all in the value of Green Mountain stock will be very puzzling to the people here. We all know the mine well, and what it is doing. Happening to drop into the retorting house a few days ago, we saw Mr. McCartney pour out a mass of molten gold into a mold. When cooled it was in the form of a sardine box, and was worth $3,200; this had been gathered from the plates in a few days. People living close to the mill are accustomed to see the same every few days, except that the ponrings are larger when the battery is cleaned out, often going over $5,000. We all know that the mine is doing better than ever before, and can only regret that every dollar's worth of the stock is not owned at home. If it were, the profits could be applied to the opening up of vast bodies of ore known to exist in the same mountain, and just as good as any in the Green Mountain mine. What a pity it is that the development of our mines and the production of vast amounts of wealth should be retarded by the manipulations of stock gamblers.

SHASTA.

COPPER CITY.—Redding *Independent*, Dec. 3d: The Chinese who went from Shasta to Copper City on the 24th inst., have not been molested. Another lot is expected soon, who will engage in mining the ground sold to them by T. Popejoy for $6,500, although the money has not yet changed hands. Potter & Hall expect to make a sale of their property to an Eastern company. By Dec. 29th it will be positively known whether a sale will be made. In the event that they do not sell, Tiffin, Cennon and others will make arrangements with Potter & Hall to work the surface diggings connected with the quartz mines, the coming winter.

ELEVATOR WORK.—Shasta *Courier*, Dec. 3d: A Colusa county man by the name of Orear is engaged in quite an important mining enterprise on the flat below the celebrated Flood's flat. A supply of water has been hargained for from the Hardscrabble Co's ditch, and an iron pipe with some 200 ft pressure is being put together on the ground. A Cranston elevator, or one similar, will be used to elevate the gravel and tailings so as to permit dumping into the creek. Jonas Smith, who recently visited and inspected the gravel mines near Yreka, which are worked by Cranston elevators, has the superintending of the work, and it is thought that the mine will be in running order inside of two weeks.

SIERRA.

RUBY.—*Mountain Messenger*, Dec. 3: The Ruby Co., at Cariboo, stopped work on their main tunnel some weeks ago, and since then have been raising a shaft to strike gravel. After going up about 80 ft some quartz mixed with bedrock was encountered, from which indication those in charge think they are on the rim of a channel. At a hight of about 62 ft from the bottom of the shaft a drift has been started into the ridge to test the theory.

OFF THE TRACK.—Last Monday morning the Bald Mountain locomotive ran off the track in the tunnel, owing to the spreading of the rails. A heavy train of loaded cars was being taken out at the time, and owing to the headway under which it was, it drew the engine about 250 ft before it stopped. Fortunately no one was injured, nor were any of the cars damaged. The men lost half a shift by the accident.

MARGARITA.—This is the name of the quartz mine at Loganville, formerly called the Hidden Treasure. The Co. have made rapid progress during the last 2 weeks. The works are now covered in. The dam is built and the flume partly laid. The hoisting engine is on the ground but not yet in place.

SEVENTY-SIX.—The owners of the Seventy-six mine, located southeast of the Pliocene shaft, on the same ridge, have let a contract to run about 300 ft of tunnel. The grades in the old tunnel became so heavy that the mine could not be worked to advantage.

GOLD BLUFF.—Vanslyke, of the Gold Bluff, has been putting on extra hands. The ledge looks and pays as well as ever. He will soon start a tunnel from the level of the mill, it is said.

ARIZONA.—The Arizona Co. are still running in the rim of their channel, on the north side of the main Pliocene ridge, about 1 mile north of the old Cornish ranch. The Co have a fine prospect.

HOG CANYON.—The mill at Hog Canyon, is all ready to run as soon as water enough for the engine starts. They have quite a quantity of good rock on hand with every prospect of striking the main ledge soon.

Work is still going on at the Good Hope mine, but they are not yet ready to run. Probably in a week or 10 days the mill will be running.

The Sierra Buttes Q. M. Co. of Sierra Co., last month paid a semi-annual dividend of 37½ cents a share, or $46,250, making a total of $1,899,025 to date. The Plumas Eureka's dividend was 75 cents per share, or $30,409, making a total of $568,750 to date.

EXTENSION.—The Bald Mountain Extension is getting pretty well prepared for winter. About 30 men are employed in and about the mine. Two shifts, of 7 men each, are worked breasting, and the average yield has been over an ounce per day to the pick. The Co. are still pumping water at the Pliocene shaft.

Work is still progressing at P. Grant's tunnel at the head of a branch of Caribou ravine.

The Chinese have abandoned their works in the river and taken out their pumps.

ECLIPSE.—Work is progressing in the Eclipse mine, the rock in the tunnel being moderately hard.

BALD MOUNTAIN.—The Bald Mountain Co. have their dumps about full, and unless water comes soon they will be obliged to discharge a large number of men for want of dump room. They have employed now about 100 workmen.

RAINBOW.—The rock in this remarkable mine is a marvel of richness. The Co. are now preparing to sink on the ledge where it was richest.

TRINITY.

NEW RIVER.—Cor. Trinity *Journal*, Dec. 3: The rainy season has set in in our parts earlier than usual and the miners are making the most of it. Nearly everyone is already ground sluicing and appearances are that this season will prove a prosperous one for New River. The Slide Creek Co. will, I believe, let their claim lie idle this winter as they have not as yet any body on it. Neither is there anyone on the Eagle Creek claim, although the latter paid very well last winter, as I have been informed by Mr. White, who ran it. Those two claims are the only ones on the river that are fitted with pipes and giants. The Portuguese Co., on Big flat have four men mining, the remainder being occupied blasting a channel through the rim rock. This constant blasting has been a serious drawback to this Co., as they have had 3 to 4 men almost constantly at it for a year or more. What a pity that their claim—acre in extent—is not fitted up properly with modern improvements? If it were so rigged it would pay big, for even now, slow work as ground sluicing is, it more than pays expenses. And by the way, no danger here of ever being troubled with the "debris question" there being no agricultural lands worth speaking of between here and the ocean.

TUOLUMNE.

RICH QUARTZ.—Tuolumne *Independent*, Dec. 3: Mr. Wm. Sell has struck very rich rock in his quartz mine near the French garden, on a spur of Bald mountain, Sonora. The rock exhibited to us is full of gold, one piece, as to weight, being one-half gold and one-half rock. The tunnel is in over 240 ft, being about 140 ft from the surface. The chute exposed is 20 ft—but neither end has been reached. It is found in three levels, the upper being 30 ft from the lower. The rock, as they stope up gets richer, and, if this continues a short distance, must reveal large masses of gold. Mr. Sell has stuck to this mine since 1850, or 31 years this month. He has worked it at different times since, and has taken out pockets aggregating many thousand dollars. The present find bids fair to eclipse even the famed Divoll bonanza. He has been taking it out largely for the past three months in a quiet way, but it has become so extensive that it has been found impossible to keep the matter from public knowledge. He pounds the rock in a mortar, and makes no statement as to the total yield to date.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—*Enterprise*, Dec. 3: Are cutting out a chamber for a winze in east crosscut No. 2, on the 2500 level; crosscut No. 3 has been extended 29 ft, and No. 5, 30 ft. Have completed and started the suction fan over the old shaft.

UNION SHAFT.—Are repairing the drift in the 1600 level out to the Sutro tunnel connection, easing timbers in shaft and cutting out bob pit at the 2600 station.

UNION CON.—The joint Mexican drill hole east on the 2700 level has been extended 115 ft. The joint Sierra Nevada winze on the 2700 level has been sunk and timbered 10 ft, and the joint Sierra Nevada east drift was extended 39 ft.

OPHIR.—During the week 268 tons of ore were extracted from the croppings and 470 tons sent to the mills. Assays not yet received from the mills.

CON. VIRGINIA.—Are still opening out and repairing drifts and winzes connecting with the old Con. Virginia shaft for ventilation.

CALIFORNIA.—Still opening out and repairing drifts and winzes connecting with the old Con. Virginia shaft.

YELLOW JACKET.—There has been no work done in the mine since Wednesday morning, the 30th ult., on account of water on the lower level, caused by the stoppage of the pumps to replace two lengths of defective pump-rod, which have been gradually getting worse.

SUTRO TUNNEL.—Since last report the three shifts employed retimbering and repairing the heavy ground near the Combination connection, have placed in position 13 sets of new timbers and 10 posts, and removed 9 sets of old timbers, 9 posts, 2 stringers and 3 drain boxes; also the usual repairs have been made on the track and a'ong the main line. A new set of timbers has been put up at the tunnel entrance, and some repairs made at that point.

BERNICE DISTRICT.

A NEW CAMP.—Reese River *Reveille*, Dec. 1: Last spring Wallace Goodall, C. W. Gilbert and others organized what is called Bernice district, near Humboldt and Churchill county boundary line. Some fine ledges were discovered there, with in a short distance of the old Graves & Healey antimony mines. The ore is principally chloride and free from base metals, and there is considerable timber in the vicinity of the mines, which are situated about 10 miles from the Humboldt Salt March, and about 90 miles south of Winnemucca. Wallace Goodall, one of the discoverers of the district, was in Austin a few days ago, and said the Golden Crown lead, in which he is interested, is from 3 to 7 ft wide, and is situated between the syenite and limestone formations. Fifty or more assays have been made of the ore, yielding from $48 to $547 per ton. Hoyt & Gilbert own the north extension, which is also showing well. There are quite a number of other locations in the district. Wood and water is said to be abundant for mining purposes.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, Dec. 3d: During the week the west drift in the fourth shaft level has been advanced 12 ft in a hard quartz formation, carrying a small streak of low grade ore. The upraise from this drift has shown no material change. Other shaft levels are yielding about the same quantity of ore as last week. All work in and about the mine is progressing as usual, and the daily output of ore has been about 60 tons. Both mills are running steadily and are doing the regular amount of work. Bullion shipments for the week ending Nov. 30th, $20,621.31. Shipmeuts on the November account to Nov. 30th, $31,818.20. There will be one more shipment on November account, which will bring the aggregate shipment for the month up to about $90,000.

MOUNT DIABLO.—Winze No. 1 has shown but little change since last report. An upraise is being made in the bottom on ore that assays from $60 to $75 per ton. The east drift, from the north crosscut at the foot of this winze, has advanced 10 ft and is showing a 12-inch ledge of ore assaying from $40 to $47. The east drift on the 3d level, north crosscut, from winze No. 8, has been driven ahead 11 ft. In the east drift, on the same level, there is a good body of ore which looks promising, though not enough work has been done at this point to determine the extent. An assay from selected ore gave a valuation of $387. The winze from the east drift on the second has connected with the upraise from the third. The winze from the west drift on the second level is down 27 ft. The west drift on the third level has advanced 13 ft.

EAST MOUNT DIABLO.—Work has been resumed on this mine, and from the manner in which the management have taken hold it is apparently the intention to continue it until satisfactory development is made on a small scale, when a larger force will be added. The recent splendid showing in the east drift from the 3d level of the Mount Diablo has put new life into the East Mount Diablo people, and it is argued that if $387 ore is found on the west line there is no reason why it should not extend into the main East Mount Diablo ground. A little pluck, muscle and money will determine it.

GENERAL JACKSON.—Fair progress is still being made in the drifts, though the ground is refractory. The ore bodies that have been cut thus far are somewhat broken and disconnected, though, in places, carrying ore of high grade. It is the intention of the company to prosecute work in a vigorous manner, and possibly sink to a greator depth to get into and cut a country where the formation is more firm and compact. However, the work of prospecting will be continued as vigorously as possible in the present levels.

LUCKY HILL.—The northeast and southwest drifts are still being pushed ahead as fast as possible. Fair speed is making, considering the character of ground through which they are being run.

ESMERALDA DISTRICT.

THE CORTEZ MINE.—The mine is looking better than ever before. The ledge at every point where work is being prosecuted shows ore of good quality and plenty of it. The prospects are certainly flattering for the Cortez to become one of the richest mines on the Pacific Coast. The credit is certainly due to the management of Supt. Wells for uncovering the large and rich bodies of ore in the Cortez, which will go far toward making Aurora boom before long.

ORE.—Esmeralda *Herald*, Dec. 3: Hernleben & Erway shipped an 8-horse load of ore last week from their mine to Gold Hill for reduction. They have been at work on the claim for some time, and we learn have a good prospect. The ditch for conveying water to the mill that is soon to be erected, is finished about one-third of the distance. H. Aldrich will soon move his family into the district.

EVA CON.—Thursday morning ground was broken on the Eva Con. mine for a two-compartment shaft. To what depth the shaft will be sunk this winter is at present unknown. The Eva Con. property is on Aurora hill, and in the incline shaft as far down as it has been sunk is a good-sized ledge of milling ore.

KINGSTON DISTRICT.

VICTORINE.—Eureka *Sentinel*, Dec. 2: J. J. Kermeen, of the Ruby-Dunderberg, R. Rickard and W. H. Sweeney came home from Kingston Wednesday afternoon by private conveyance, making the 85-mile trip between 8 o'clock in the morning and 6 in the afternoon. Mr. Kermeen informs the *Sentinel* that the Victorine is a splendid property. The formation is a horizontal deposit, or "blanket ledge," of iron pyrites, from 8 to 10 ft thick, and gold. The main tunnel, under the vein, is 80 ft in length, while there are a number of other and shorter tunnels parallel with this. The ledge has been explored at many points from all these tunnels, and, with a little upward rise, continues the same throughout. Much of the ore goes between $400 and $500 in gold, and it ordinarily carries $8 to $10 in silver. It is very rebellious owing to the large proportion of iron it carries. It is being worked by a new chlorination process, the success of which seems assured. From the mouth of the main tunnel the company have a railway 1,500 ft in length, from the terminus of which a tramway extends 1,580 ft down to the valley road, from which point to their 30-stamp mill the distance is two miles. The mill will be ready to start up in a month.

MOUNT GRANT DISTRICT.

BUSY.—Esmeralda *Herald*, Dec. 3: Mrs. H. Aldrich made Mt. Grant a visit the first of the week, and relates to a *Herald* representative that every body in the camp is busy. E. W. Bennett has charge of putting in the new machinery at the Big Injun mill, and expects to have the mill running about the middle of this month. Cory City presents a lively appearance, and the mines at work are working well. There is not an idle man in camp. When the mill gets ready to crush, bullion will be shipped regularly from the Big Injun mine.

SAFFORD DISTRICT.

ENORMOUS DEPOSIT.—Eureka *Sentinel*, Dec. 2: From Rohl. Crossan, who returned from Cayuga yesterday, we learn that the mines in that camp have a prospect of being immensely valuable. He says he saw upwards of 50 assays from the Onondaga mine which ran above $400. He saw a great many more assays of ore from the same mine which go from from $18 to $600. Mr. Crossan, who has done a good deal of prospecting himself, has an idea of his own about the formation. He thinks that they have no wall—nothing but a clay seam—in the Contention, which lies between the Onondaga and Illinois on the same hill and runs parallel with them. He thinks that these three mines make up a single ledge from 800 to 1,000 ft in width. He says that he thinks that there are only two walls (of porphyry), one bounding the outer limit of the Onondaga above and the other bounding the Illinois below; and because the "stringers" (mistaken for ledges) in the adjoining mines northeast and southwest bend into this mammoth deposit and assume its direction or near approach. The mass of ledge matter is manganese cut with stringers of ore, the manganese carrying a very small per cent. of silver. The ore is dark colored, hard and with streaks of sulphurets. It is similar to the ore from the Eureka Tunnel, but darker. The assays referred to are bona fide and made by Tyson, who has all he can attend to in his business.

ARIZONA.

STRIKE IN WARSAW.—Arizona *Citizen*, Nov. 30: Mr. J. M. Kirkpatrick came up from Oro Blanco this morning, and brought specimens of ore from the new strike in the Warsaw mine, the property of the Orion M Co. The bonanza was reached last Saturday at a depth of 75 ft, and the ledge was found to be 3 ft wide, the ore averaging across the ledge $600 per ton. The ledge is all ore, and the walls are perfect, being between syenite and porphyry. The Warsaw mill has been idle for a short time awaiting shoes and dies, which were forwarded to-day from this city. The mill will start up next Sunday on the rich ore, and a continual stream of shining bullion is expected to follow. In doing the assessment work on the Alaska mine, near the Warsaw, also the property of the Orion Co., at a depth of 45 ft a 4-ft ledge was encountered that assays an average of $150 per ton. Some specimens run up to $1,500. The importance of these rich strikes to that district and to Arizona are very great.

MILL AND SMELTER.—Arizona *Democrat*, Nov. 30: C. C. Bean has dismantled the Hoeffler mill, preparatory to locating it on some of his producing properties; he has also erected a smelter on his copper mines, on Castle creek, having lately removed the machinery from Charlie Genung's residence, in People's valley. The Bed Rock M. Co. are engaged actively on their property near the Model mine. The mill is running day and night on good gold ore. Gov. Power's mill, at the Model mine, is running constantly on good ore from that mine.

MILL.—Some San Francisco capitalists propose to erect a 10-stamp mill on the Niagara mine, near the Model mine. This will make three stamp mills within a circle of a mile. That speaks very well for that district.

SILVER BELT.—Daniel C. Thorne returned, yesterday evening, from the Silver Belt mine. Whilst there, he shipped $20,000 in bullion to San Francisco, the result of the last run. We propose to give a detailed statement of the amount of bullion taken from this mine since its first working, and will show that its net results go way up into the hundreds of thousands. There has been a continual stream of bullion pouring from the mine for the past two years. There is a force of 22 men at the mine and smelter. Tim Gleason proposes to prospect with Mr. Ward in the neighborhood of the Dosoris. Several very rich discoveries are on the *tapis* in that neighborhood.

HYDRAULIC.—From Mr. A. Moody we learn that the hose necessary to hydraulic the Lynx creek placers are on the way from Chicago. There is a force of men at work enlarging the reservoir. The ditch is all repaired, new flood gates put in. As soon as the wet weather comes, then active work on the claim will be pushed.

TONTO BASIN.—Arizona *Journal*, Dec. 1: The outlook of Grass Valley mining district is very flattering, as all the prospects improve as depth is gained. The Excursion mine is giving promise of an exceedingly rich property. They have 7 ft of good milling ore in the bottom of the shaft. It is an assured fact that the Co. is having an improved quartz mill built for their property. The ore they are getting will probably mill $25 a ton. They have several hundred tons on the dump. The Gowan mine is looking splendid. They have five and a half of high grade ore at a depth of 85 ft. I guess it is an assured fact that the Excursion Co. have bought the Gowan mine for the sum of $40,000—at least that seems to be the prevailing opinion of men that seem to know. If they have bought it they have got one among the finest prospects in the Territory, as the ore has continued to improve from the surface down to the present depth. Birchett & Chilson are putting up arastras on the Golden Wonder mine. They intend to use steam as the motive power. They feel confident that they will make a success of working their ores by erastra process.

MAGAZINE DISTRICT.—Arizona *Gazette*, Dec. 4: Last Sunday M. Asher & Bro. received a little over a ton of ore from the Red Rover mine, in the Magazine district. In a few days they expect to receive another load, when the entire amount will be shipped to San Francisco for reduction. This ore is of a high grade and is expected to yield all the way from $6,000 to $10,000 to the ton. The Red Rover is owned by John A. Cox & Co., and these gentlemen, being possessed of but limited means, have not been able to work the mine to the extent that its apparent worth would justify.

COLORADO.

RED ELEPHANT.—Georgetown *Courier*, Dec. 4: The new shaft and ore house at the Barrett shaft on the Boulder Nest mine, is completed; the engine has been repaired and is in running order; the new spool and running gear are on the ground, and it is expected that hoisting will be resumed on next Monday morning.

STRIKE ON REPUBLICAN.—A good strike was made last Friday on the Olympic lode, situated up Cherokee gulch, about 2,000 ft above the Pelican-Dives, and in line with the Diamond tunnel. The lode is owned by Capt. J. F. Phillips and H. N. Moore, who have driven an open cut about 20 ft to the lode, where they struck a 5-inch vein of ore that assays 438, 672 and over 1,100 ounces of silver to the ton, and also a fraction of an ounce in gold. The quartz from the vein, carrying specks of ore, assays 42 and 98 ounces. The strike is a very promising one, giving unmistakable indications of a valuable property. An ordinary specimen, about what this ore will average, assayed 652 ounces.

The Ariadne lode, on Spring creek, Trail Run district, owned by N. J. Moss & Co., is showing a very large body of gold ore. The shaft is 55 ft deep and shows a vein of quartz from 4 to 8 inches thick that has produced mill-runs of from 30 to 60 ounces of gold per ton. There is also a body of quartz from 12 to 14 ft thick that prospects well in the pan, and would pay handsomely if there was a quartz mill conveniently situated so that it could be treated.

LAST week an encouraging looking strike was made in the Louisiana lode, on Sherman mountain. While sinking the shaft, at a depth of 55 ft a vein of good looking ore was encountered about 4 inches thick, which is growing larger as it is being sunk upon, and gives indications of changing to a large body of ore within a short distance. The lode is situated near the Meadota, about 1,000 ft below the Dunderberg, and is owned by the Louisiana M. Co., a St. Louis corporation, of which Mr. Stephen A. Beemis, of that city, is president.

IDAHO.

THE OUY MINE.—Wood River *Times*, Nov. 30: This mine, located by Messrs. Garrard & Campbell last year, and which distinguished itself by a quick shipment of 10 tons of ore to Salt Lake City, which netted $3,050, has just passed into the hands of a company formed at Toledo, Ohio, through F. J. Scott, of that place. The mine was bonded in Sept. last, Mr. Scott being associated in the bond. The mine is located 10 miles southwest of this place, on one of the head streams of Rock creek, 2 miles south of the Ornament and Ohio mines, and 6 miles southwest of the Bullion group, above Croy creek. The formation or country rock in which the vein occurs is a soft, whitish, quartzose granite or granitic porphyry. The vein itself is a wide one; how wide is not yet known, as the workings, which follow the footwall at an angle of 25° from vertical, have all been in clay and vein-matter—all picking ground. The owners had about 50 tons of ore on the dump and some in sacks on the road to our smelter, when the latter shut down, after having worked a small lot of 4,860 lbs., which yielded $200 a ton. Work is to be kept up at the mine by a small force this winter, in charge of Henry Selkirk, foreman.

ATLANTA AND ROCKY BAR.—Wood River *Miner* Nov. 30: Mr. Yount reports times at Atlanta and Rocky Bar about as usual with small mining camps at this season of the year. Some 50 men are employed about Atlanta. The Bonaparte mill, near Rocky Bar, is crushing ore from that mine. Snow on the divide between Atlanta and Rocky Bar is 4 ft in depth. No work is at present being carried on in the Yuba tunnel. It is in about 700 ft. The Buffalo, Last Chance, Monarch and several other mines of Atlanta are working. The Ida Elmore Co., at Rocky Bar, is putting up elegant hoisting works. They will be ready for use inside of a month. The Buffalo mine is looking fine, and the mill has been pounding almost incessantly for the past 18 months on ore from it and other mines. Mr. W. H. Pettit, Supt. of the Monarch mine and mill, is now on his way East to meet the company. It is thought they will have a new mill in the spring. If they do not build they will remodel and greatly improve the old one. The Tahoma mine, purchased by an Eastern Co. last spring for $110,000, is in splendid shape. It is estimated that two-thirds of the amount paid for it is now in sight. The Tahoma Co. have a fine mill stored at some point between Kelton and Atlanta. It was the intention to get it in and shove it up this winter, but delays and bad weather prevented it.

MONTANA.

PARROTT.—*Inter-Mountain*, Nov. 28: The Parrott is being vigorously developed. The main shaft cut the ledge at a depth of 160 ft. A drift east has since been extended on the vein to a length of 100 ft and is still being driven ahead. The ore body in the face is about 5 ft wide and assays between 18% and 25% in copper. A fine block of ground is thus being rendered available for stoping. The present ore product is being shipped for reduction to the company's smelter, where about 100 tons of matte, assaying 60% copper, have lately accumulated. The enlargement of the works is progressing rapidly. The Parrott Co. employs about 40 men.

WASASH.—The water in the mine occasions very little trouble and the machinery is running smoothly.

BELL.—A contract has recently been let for the shipment of 40 tons of ore per diem from the mine to the smelter. Over 300 tons of first-class ore have recently been extracted.

AT THE Bell smelter everything is proceeding satisfactorily. On Saturday morning one of the roasting bins was fired up. It contains 100 tons of ore placed between two layers of cordwood, which on being lighted are supposed to ignite the sulphur, of which the ore carries about 30%. The sulphur will burn out, Mr. Longmaid says, in about one month, the percentage being sufficient to maintain a constant fire without the addition of any more wood. The other bins will be started up as soon as the ore can be hauled down from the mine, which work is delayed somewhat by the scarcity of teams. On the completion of the roasting process the ore will be ready for the water jacket furnaces, the erection of which is finished.

BULLIONVILLE, Nev., is quite lively. The furnace is running well, and many teams are engaged in hauling ore, wood, etc.

Gold and Silver in Use.

The annuel report of the Director of the United States Mint for the fiscal year ended June 30, 1881, contains, in addition to customary detailed statements of the operations of mints and assay offices, much valuable information in regard to the production of precious metals in the United States and in the world; their use in the coinage of this and foreign conutries; consumption in arts and manufactures; specie circulation; comparing paper and metallic circulation for a series of fifty-six yeare, with the percentage of yearly prices to the mean prices of staple articles; indicating annual variations; gold and silver received and operated upon by all the mints and assay offices, exceeding by more than $50,000,000 the receipts of any previous year, amounting to $226,225,522, of which $103,371,101 was gold, and $32,854,421 eilver.

This large increase was due to the continued influx of gold from abroad, over $95,000,000 deposited being from that source alone. The coinage facilities of the mints have been enlisted to their fullest extent in converting this hullion into coin. The gold coinage amounted to $78,733,864, of which $15,345,520 was in double eagles, the remainder in coins of leseer denominations. The coinage of eilver was confined to the minimum value of silver bullion required to he coined by the law authorizing the coinage of standard eilver dollars, $27,637,950 of which were struck. Of euhsidiary coins only $12,011 were coined, and of base metal or minor coin, $405,109. The totel coinage of silver dollars since the passage of the act for their coinage, up to Nov. 1st, was $100,672,705, of which $34,096,327 are in circulation, and $58,833,770 are held by the Treasury for the payment of outstanding silver certificates, leaving $7,137,608 for dishursement hy the Treasury in ordinary payments.

The usual examinations and settlements were made at the close of the year.

Referring to the probahle restoration of silver to its former place in the monetary circulation, the Dirctor says that in view of the failure of the International Monetary Conference to agree upon any practical measure, and while awaiting its future action, it is a question for our own serious aud early consideration whether it is desirable to suspend further coinage of silver until, hy international agreement and effective legislation, the unlimited coinage of silver and gold at common fixed rates shall be provised by the principal commercial nations of Europe and America. Should the $65,000,000 in silver coin now full legal tender in Europe, be demonetized, the United States could not, singlehanded among commercial nations, sustain the value of silver from inevitable fall. With that danger menacing us, we cannot, without serious embarrassment, continue such coinage. Unless other commercial nations will agree upon the general use of silver as well as gold, the further coinage of silver dollars of the present weight, unless needed for circulation, is a useless oxpenditure.

Director Burchard estimates the world's production of gold for the calendar year 1880, at $107,000,000, and of silver $87,500,000. The consumption of the world in ornamentation, manufactures and arts is estimated for the same period at $75,000,000 gold and $35,000,000 in eilver. The estimated calculation in the principal countries of the world is placed at: Gold, $3,221,000,000; full legal tender silver, $2,155,000,000; limited tenders, $423,000,000; total specie, $5,757,000,000; paper, $3,644,000,000; making the total circulation, including the amount held in Government securities and banks, and in active circulation, $9,403,000,000. Upon the subject of the course of prices, and indicating the annual varietions in the purchasing power of money in the United States, the Director has prepared tahles showing the average annual prices for 56 years, with the mean prices of gold aud eilver, and also the relation which the average annnal price of each article beare to the mean price for a whole term of years. The mean percentage for each year of all the articles named furniehee a hasie for measuring the purchasing power of money, and is instructivcly compared with the per capita circulation and estimated wealth for each year.

Some of the Bad Effects.—Should it be finally determined that hydraulic mining muet cease, the prosperoue section of Nevada county, known as the Ridge, would become a deeert. The towne of Washington, Omega, Eureka, Moore'e Flat, North Bloomfield, Cherokee, Columhia Hill, North San Juan, Sweetland, French Corral and all other intermediate camps would straightway he deserted. Every branch of trade there depends upon the prosperity of the hydraulic mines, and must stand or fall with them. There are no quartz-mining, farming or lumhering intereete there wortb mentioning. The several thousande of lahoring people there would he rcduced to want, their cosy homee rendered valuelees, and decolation would reign eupreme. The hlow would he alao felt in thie part of the county with terihle effect. At least eeven or eight rich hydraulic mines in the township would he rendered unproductive, the half a hundred teame engaged in transferring freight from the railway here to the ridge would find their occupation gone, the immenee trade, most of which now comes to our merchants, instead of enriching Maryeville as heretofore, would he ruined, city real eetate would drop to ruinoue prices, and the etirring county aeat would resolve itself into a half-deserted village. —*Nevada Transcript.*

The Carson & Colorado Railroad.

Trains, hoth freight and passenger, are now being run to Soda springs, on the Carson & Colorado railroad. This point is 137 miles from the Mound honse (the western end of the road), and 13 miles from Belleville. Soda eprings will be the stetion for freight and passengers until the road reaches Belleville. Stages now leave Soda springs daily for Belleville, Montezums, Candelaria, Gold Mountain, Silver Peak, and other places in that direction.

At Lunning, 125 miles from the Mound house, etege lines connect the road with Grantsville, Tyho, Belmont and other placee in that part of the State. To-day (Dec. 1st), Gilmer, Salishury & Co. will put on their etage line, connecting with Grantsville, Belmont and several other leading towns and camps in the eastern part of the State.

The road, as far as built, is highly spoken of by all who have heen over it. The road bed is well constructed, and the track very well and carefully laid. Those who havo traveled over the Carson & Colorado are loud in its praise. They say they have never seen its equal for emoothness. For miles on miles there is neither jolt uor jar, the best of eteel raile having been used.

The road will he rushed through "in spite of wind and weather." The company have now on hand 1,000 tons of steel rails, and have ahead 100,000 ties, with more rails and more ties coming right along. The road will he completed to Belleville hy the 15th of this month, and about the 1st of January the care will be running into Candeleria. As each point is reached, trade is opened in all directions.—*Enterprise.*

How to Preserve Autumn Leaves.—A contemporary answers, as follows, the question, "What are the best methode of preserving autumn leaves and when should the leaves be gathered?" It depends somewhat upon the season when the leaves develop their greatest beauty and variety of tints. Sumac and the leaves of similar plants or trees are usually gathered early in Octoher. Maple, alder, oak, linden, etc., are now at their best. To preserve the leaves they sbould be thoroughly dried as soon as possihle after gathering and trimming. A simple method of drying the leaves expeditiously is the following: Spread the leaves and press in a suitable pen with alternate layers of fine sifted dry eand heated as hot as the hand can hear, aud set aside to cool. When the sand has cooled, the leaves may be removed, smoothed under a hot iron, dipped for a moment in clear French spirit varnish, and allowed to dry in the air. Melted paraffine and wax are sometimes preferred to the varnish. The following is another way: Spread eeveral thicknesses of fine wrapping paper on the ironing table; arrange the leavee of the spray, picking off those which do not add to ite hsauty, and lay it out smooth. Pass a warm fleiron over a cake of wax and then over the leaves—first on one side and then on the other. Then place the sprays hetween sheets of bihulous paper, and put under pressure hetween two flat hoards, for ssveral weeks, changing the paper several times.

Hydraulic in Idaho.—Buzzini, Brodtmiller & Spearn finished the season's run, about two weeks ago, in their hydraulic claim between Granite and Hoodoo creeks, about two miles east of town, and mede a very handsome clean-up. This company commenced operatione there about eight years ago, and since that time have been adding to the property hy huying one claim after another, and now they own all the ground hetween the two creeks. As Paul Buzzini says, the area ie not epoken of as feet, hnt miles. The compauy worked nine men the past season, and with a force no less than that it is estimeted that it will take at least 50 years to work out the ground, all of which prospects well. This hydraulic, the past eeason, was turned loose on Crepiecola hill, and the gronnd there ie now opened in good ehape for working to good advantage next year, and if the water holde out as long ae it did this season, the cleanup from the next run will exceed the last by 400 or 500 ozs. The ground on this hill is 30 ft. deep in the shalloweet placee, and 100 ft. at the deepeet with an average of about 50 ft. A numher of ditchee, the total lengths of which are about 30 milee, have been brought onto the ground. The company has five reservoirs, and with them are enahled to run the pipe aeveral hours each day for some time after the water in the ditches falls below what is required for contiuuous working.—*Idaho World.*

It is well known that the minee that are worked to a profit by hydraulicking would, in ecarcely a single instance, pay hy the drifting process, and muet be worked by the present mode or not at all. The abandonment of hydraulic mining would make no increase in drift mining over what ie now done. Minere understand what ie practicahle in the way of gravel mining, and adapt their operationa to the character of the ground to he worked.

Carson is again agitated on tbe subject of smelting worke. It is thought that two furnaces with the capacity of from 10 to 15 tona each can be kept supplied with copper and eilver ore from the minea of the neighborhood and of Genoa.

The North Fork dam, on the North Fork of the American, near Auburn, is completed.

Second-Class Passengers on California Railroads.

At a recent meeting of the California Board of Railroad Commissioners, the following resolutions were introduced by Gen. Stoneman:

Ordered: First—that from and after the first day of January, 1882, second-class accommodation for second-class passengers shall be furnished by and over all railroads in this State, at rates of fare not to exceed 60% of the rates charged for first-class passengers on the said roads for the same distances, in the same directions and hetween the same stations.

Second—That eecond-class passengers ehall not be required to travel in smoking cars.

Third—That second-class passengers shall have the same right to lay-over tickets on all the railroads in the State as is granted to first-class passengers.

Gen. Stoneman, in commenting npon the resolutions, said: "The first order is predicated upon the well-known principle, as enunciated by railroad managere, that tariffs are hased upon what the commodity will hear. If the first-clase passenger ie charged wbat he will bear, certainly the second-class passenger ought not to he expected to pay as much as the first-class, and should bc charged what he will bear, and no more.

"The second order is dictated by sentiments of common decency and common humanity. First-class passengers have no more right to enter second-clase cars to do their emoking than second-clase passongers have to enter first-clase cars to do the seme thing. The rights of the second-class passenger are as sacred as are the rights of the first-class passenger.

"The third order is simply carrying ont the theory that railroads are, or should be, managed and operated in the interests and for the benefit of the whole public, the poor as well ae the rich, and when they fail to do thie they fail to accomplish tbe principal ohject for which they were authorized and created. Lay-over tickete entail and necessitate no additional expense upon the railroads, and no reason exists why they ehould not he furnished when reqnired by the second as well as the first-class passenger.

"It is not expected that second-class passengere ehall be furnished with first-class accommodations, or with upholstered cars; all that is required is that they shall be transported over the roads at such rates as they can afford to pay.

"The passage of this order will work to the great advantage of nine-teuths of the people of this State, and, I am firmly convinced, will result in no loss to the railroads, but, on the contrary, the increase in the volume of second-class travel will more than compensate for the decrease in the number of first-class passengers. Whether it does or not, it ie no more than the public have a right to demand; and if the railroad companies were wiee, they would grant it without the asking."

The consideration of the resolutions wae laid over until the next meeting of the Board.

Matters at the Savage.—Tho Savage Co. are now daily shipping to the Santiago mill, Carson river, from 90 to 200 tone of ore. There is now at the mill about 1,000 tons of ore (which is about all for which room can he fonnd without doing a good deal of shoveling) with about 800 tons in the dump at the mine. There are now 80 men employed at the mine. The ore hreast on the 1640 level etill comtinues to look well, and much good ore ie being obtained on the old Potosi tunnel level. On the 1100 level, crosscut No. 2 night before last cut through a solid wall of clay about three feet thick, and yesterday the face was passing into quartz of a promising appearence. Ore is liahle to he found at this point. The drift from the Chollar-Norcroee-Savage ehaft on the 2400 level is etill in the bard black rock, hut notwithstanding the hardnese of the rock the drift is being pnshed ahead at the rate of 10 ft. a day. The hlast fired in the face of the drift can now he heard in the bottom of the incline or rather at the level of the water, at the 2200 etation. At 2 o'clock P. M. day hefore yeaterday, when they were ahout to hlast in the drift, Supt. Keating poated himself in the incline and heard the ehots very dietinctly. The air ie very good at the face of the drift. The Santiago mill will etart up next Monday. W. H. Armetrong, formerly of the California mill, in this city, ie Supt.

Gold in Chile.—Saya the Lebu *Liberal:* It is now heyond douht that the Montana Negra gold minee are of anch richneee that they will influence not only the futnre of thie province but that of the republic. They are sitnated in placee where water and timher are ahundant, at a short distance from this city, and at five leaguee from Canete. Only preliminary workinge have been carried out, and yet it may be affirmed that hnndrede of thoueande of dollare have been taken out. October 8th, a nugget which weighs 3,005 grains was found. The gold field covers an extent of eix leaguee south to north hy two from east to wcet. A hig nugget, taken out by Smith & Soreano, measuree 6½x3½x2 inches.

Wabuska has become a heavy ehipping point. All the freight from Mason valley and the mining districte in the neighborhood is handled there, and nearly all for Cory dietrict. The Poatoffice has been moved from Swasey's down to the etation, and a store, a boarding houee and a grain depot are already erected.

To the Sutro Tunnel Level.

Following are the depths from the hoisting works of the leading mines to the level of the Sutro tunnel or its branches; also the angles of the inclines, where there are inclines from the bottoms of the main vertical shafts:

Utah, 1,465 ft.; angle of incline, 46°; Sierra Nevada, 1,501 ft.; Union shaft, 1,502 ft.; Ophir, 1,600 ft.; pitch of incline, 37°; C and C shaft, 1,510 ft.; Con. Virginia, 1,625 ft.; Bonner shaft (Gould & Curry mine), 1,676 ft.; angle of incline, 55°; Gould & Curry and Best & Belcher shaft, 1,448 ft.; Savage shaft, 1,650 ft.; pitch of incline, 38½°; Hale & Norcross, 1,626 ft.; pitch of incline, 40½°; Chollar-Norcross-Savage shaft, 1,598 ft.; New Yellow Jacket shaft, 1,513 ft.; Old Yellow Jacket shaft, 1,430 ft.; angle of incline, 45°; Old Bullion shaft, 1,766 ft.; angle of incline, 41½°; Con. Imperial, 1,732 ft.; angle of incline, 43½°; Crown Point, 1,394 ft.; angle of incline, 35°; Belcher shaft, 1,449 ft.; angle of incline, 33°; Overman shaft, 1,201 ft.; Forman shaft, about 1,495 ft.; Caledonia, 1,153 ft.; Alta, 1,030 ft.; Justice, 930 ft.; pitch of incline, 40½°; Silver Hill, 757 ft.; pitch of incline, 38°; Old Chollar-Potosi ehaft, 1,695 ft.; pitch of incline, 45°; New York, 1,059 ft.; Baltimore, 1,205 ft.; pitch of incline, 38°. These measurements are from the surface of the ground at the top of the sbafts.—*Enterprise.*

Wood River Smelter.—On Thursday afternoon the Wood River Smelting Co. put out their fires and cnded this year's smelting campaign. The company are tho pioneer smelters of Wood River. The emelter was shipped into thie country last spring, and after some delay from various causes, was ready to do work in July. Of course, the "10-ton affair," as they termed it, has long since vindicated itself, hut its record will be of interest. Operatione commenced on the 25th of July, and closed on the 15th inst., but during that time the works were idle 35 days from lack of ore, fluxing, etc., which makes 79 the total number of days in operation. In this run of 79 days duration, through the efficient management of Mr. A. Wolters, one of the company, the furnace turned ont 288 tons of bullion, valued at $200 per ton in silver, besides the lead. This ie the yield of 650 tons of ore. In redncing this ore 294 tone of iron ore and 100 tons of limerock were used. There are $6,000 worth of matter on hand which could not he reduced this fall for the want of fluxing. Work will be resumed on May 1st, next year, when the facilities for reducing ore will be greatly increased.—*Wood River Miner.*

Rough Railroading Work.—According to Andrew Onderdonk, the well-known contractor, who is at present in the city, the building of the 125-milo section of the Canadian-Pacific Transcontinental railroad, on which he ie now engaged, presents unprecedented and almost incurmountable difficulties in the way of railroad huilding. The men employed in the work have to lahor on scaffoldings and etagings euspended over cliffs at great hights. The road, which is hetween Port Moody, on Burrard's inlet, and Halifax, N. S., is 4,500 milcs in length, the longest continuous road in the world. The section Mr. Onderdonk has in charge is hetween Yale, on the Fraser river, and Lake Humboldt. In a distance of 25 miles there are as many tunnels, and the entire section of 125 miles will have to he shelved and galleried. The section will be completed in three years. At present there are 3,000 men employed, and in the spring there will be about 10,000, half white and half Chinese. The estimated cost of the entire road is $60,000,000.

The Life-Saving Service.—The superintendent of the Life-saving Service in his annual report says: At the close of the fiscal year the eervice included 183 etatione—143 on the Atlantic, 34 on the lakee and 6 on the Pacific. The numher of casualtiee on the Atlantic coast within the ecope of the eervice wae 151; on the lakee, 94; on the Pacific, 5. The numher of people loet wae 26; the numher brought aehore hy life-saving appliancee was 408, and euccor was afforded to 407. At the varioue etations, 178 veesele were helped by the life-saving crewe to get off when stranded and piloted to places of eafety. The estimated valne of the veesele wrecked within acope of the eervice, together with cargoee, is $4,074,752, of which amount $2,828,680 wae eaved. The General Superintendent recommende the eetahlishment of additional statione on the Atlantic coast and lakee, and urgee an increase of wagee of the men employed.

More Successful Artesian Wells.—An artesian well, sunk on the premisee of the new huilding of Huntington & Hopkins, on the corner of Front and Market streets, supplies much more water than ie needed on the premises, and is of excellent quality. In excavating for placee for new elevator machinery, new welle have been found, one of which, at a depth of 40 ft., eupplies a quantity in excess of the mechanical and other neede of the new huilding the firm has just put up.

The new tank which ie to supply water for the hydraulic pump at the Chollar-Norcross-Savage ehaft will be 100 ft. long, 20 ft. wide and 10 ft. deep. Workmen are now engaged upon it. The pipee which will carry the water from thie tank to the pump will be one foot in diameter.

The Engineer.

Successful Moving of a Large Hotel.

At a recent meeting of the Engineer's Club, of Philadelphia, the secretary read a detailed description of the moving of the Hotel Pelham, corner of Tremont and Boylston streets, Boston, for the purpose of widening Tremont street. The hotel is built of freestone and brick, 96 and 69 ft. frontage. The Boylston street wall is supported on 8 granite columns 12 ft. high, 3 and 4 ft. square. There is a basement and 7 stories above the sidewalk. Hight above tramways upon which it was moved, 96 ft. Weight, 5,000 tons, exclusive of furniture, which was not disturbed during removal, as also were not the occupants of the stores on first floor and some of the rooms. The general arrangements for moving consisted of heavy and substantial stone and brick foundations for iron rails and rollers, and the building was forced to its new position by 56 screws, two inches diameter, half-inch pitch, operated by hand against timbers arranged to uniformly distribute the pressure against the building.

Much care and ingenuity was displayed in the details of the arrangements and work. Two months and 20 days were occupied in preparation, but the actual time of moving was but 13 hrs. and 40 min. The greatest speed was 2 in. in 4 min. The hotel moved about one-eighth of an inch at each quarter turn of the screws. The whole distance moved was 13 ft. 10 in.

Four thousand three hundred and fifty-one day's labor was required for the work. The whole cost was $30,000. This is the largest building that has ever been removed, although larger have been raised, which latter is a much simpler and less risky operation. The complete success of this undertaking is shown by the fact that cracks which existed in the walls prior to removal were not changed by the operation. Paper was pasted over them before commencing, so that if any change occurred it might be seen.

A Great Piece of Masonry.

Among the many splendid specimens of masonry which have from time to time been erected in various countries, and are pointed at as monuments to the honor of their designers, the largest and most splendid masonry arch in the world is probably the least known. Erected, along with many other engineering works in connection with the Washington aqueduct, of which it forms a part, during the decade immediately prior to 1863, very little public attention was directed to this wonderful work, either in America or England, consequent, doubtless, in great part, upon the discordant condition of the United States during the progress of the civil war; and in quarters where one would expect to find its proportions delineated, the barest mention occurs. The Union arch carries the Washington aqueduct over the Cabin John creek, the entire span being 220 ft., or 20 ft. in excess of the span of the famous Chester arch across the Dee in England, 68 ft. longer than the central arch of London bridge, 92 ft. longer than the noted bridge over the Seine at Neuilly, and 100 ft. longer than the arches of the Waterloo bridge over the Thames. The width of the structure in question is 20 ft., and the hight of the arch is 101 ft. The dimensions of this arch, therefore, eclipse those of any of the celebrated structures which are most commonly pointed to as wonderful achievements.

Drainage by Electricity.

The first extensive application of electricity for mechanical or engineering purposes is about to be undertaken in Mexico, in connection with the engineering operations already mentioned in these columns, having for its object the draining of the great water basin, in the center of which the city of Mexico is situated. The plan in brief is to establish on the western slope of the mountains, where the fall is great and rapid, a number of water wheels sufficient to develop some 20,000-horse power, and make them drive dynamo-electric machines of high electro-motive power. The current from these machines is to be conducted about 20 miles to a set of electric motors placed on the margin of the lake, and driving pumps, which will require about 7,000-horse power to work them. The water has to be raised about 40 ft. to clear the ridge, but once raised it has an uninterrupted fall toward the Pacific of several thousand feet, so that the descending water is made to add to the power required for keeping up the work. The whole apparatus constitutes what Mr. Maxim calls an "electric syphon." This plan obviates the necessity for extensive blasting operations, and, it is believed, will succeed, and thus relieve Mexico from the inundations that have damaged it so much for several centuries.

Underground Telegraph in Philadelphia. The work of laying the conduit for the underground telegraph system on Market street has now proceeded as far as Eleventh, east from the public buildings, and work is progressing at the rate of half a square a night. The conduits have 20 separate chambers. Each chamber has capacity for 50 wires, and connection is made by means of manholes, which are located at each square.

Useful Information.

How to Detect Adulterated Coffee.—*Food and Health* gives the following method of detecting adulterated coffee: Take a little of the coffee and press it between the fingers, or give it a squeeze in the paper in which it is bought; if genuine, it will not form a coherent mass, as coffee grains are hard and do not readily adhere to each other; but if the grains stick to each other and form a sort of "cake," we may be pretty sure of adulteration in the shape of chicory, for the grains of chicory are softer and more open, and adhere without difficulty when squeezed. Again, if we place a few grains in a saucer and moisten them with a little cold water, chicory will very quickly become soft like breadcrumbs, while coffee will take a long time to soften. A third test: Take a wineglass or a tumbler of water, and gently drop a pinch of the ground coffee on the surface of the water without stirring or agitating; genuine coffee will float for some time, while chicory or any other soft root will soon sink; and chicory or caramel will cause a yellowish or browning color to diffuse rapidly through the water, while pure coffee will give no sensible tint under such circumstances for a considerable length of time.

New Cooking Utensil.—The ordinary range of cooking-stove, in which the fire-box is placed at the side of the oven, or in which the products of combustion pass over the top, have the disadvantage of an irregularly heated oven. The sides and top are hotter than the bottoms and ends or other sides, and, as a result, the bread or other food is improperly cooked—perhaps burned at the top while badly done at the bottom. To correct this defect in ovens, a simple appliance has been devised for causing the air in the oven to circulate, and thus carry the heat obtained by radiation to all parts of the oven. A sheet of metal bent into the form of the top and on one side of the oven, is supported on wire standards and placed in the ovens. In the narrow space between the sheet-metal and the hot side and top of the oven, the air is heated more than the main body of the oven, and by expansion it rises and moves over the top of the oven, toward the cooler walls. The arrangement, simple as it is, appears to be founded on a good idea, and is reported to work well in practice. The apparatus examined was portable, and is designed to be put in the oven by the cook whenever an even heat is needed.—*The Century Magazine.*

Sea-Weed Sea-Serpents.—In a letter to the *Madras Mail*, on the use of gigantic sea-weed as a protective agent for shores, Capt. J. H. Taylor, the Master-Superintendent of Madras, gives the following interesting "sea-serpent" story: "A notable incident connected with this sea-weed is recalled to my recollection by Dr. Furnell's letter. About 15 years ago, while I was in my ship at anchor in Table bay, an enormous monster, as it appeared, was seen drifting or advancing itself round Green point into the harbor. It was more than 100 ft. in length, and moved with an undulating snake-like motion. Its head was crowned with what appeared to be long hair, and the keensighted among the affrighted observers declared they could see its eyes and distinguish its features. The military was called out, and a brisk fire poured into it at a distance of about 500 yards. It was hit several times, and portions of it knocked off. So serious were its evident injuries that on its rounding the point it became quite still, and boats went off to examine it and complete its destruction. It was found to be a specimen of the sea-weed above mentioned, and its stillness after the grievous injuries inflicted was due to its having left the ground swell and entered the quiet waters of the bay."

The First Compound Marine Engine in America.—The engine was a compound, working steam at 80 lbs. pressure, and the cylinders were arranged one inside of the other. The designs were by Erastus W. Smith, the well-known engineer of this city. It belonged to the steamboat *Buckeye State*, which was built at Buffalo, we think, about the year 1850. The engine was at that time a great novelty, and the boat ran for many years on Lake Erie. What became of her finally we do not know, and we make these facts public in the hope of eliciting from our friends in that section some more positive and decided details than we are able to give, ours being derived from a personal visit 30 years ago, to the boat itself. The visit was not prolonged, for, learning that 80 lbs. of steam were on the boiler, we found our time was very limited. We believe this to be the first compound marine engine used in this country, but will correct this statement if it is erroneous. —*Mechanical Engineer.*

How to Make Soluble Glass.—The following is the recipe generally employed by English manufacturers for producing that article by fusion in crucibles: Pure quartz, 45 parts; powdered alkaline carbonate, 23 parts; charcoal, 3 parts. Another recipe is: Quartz sand, 100 parts; caustic soda or potash, 48 parts; and charcoal powder, 5 parts. Or, washed quartz sand, 65 parts; anhydrous alkaline carbonate, 34 parts; and charcoal powder, 4 parts. The mixture is heated to redness, until entirely fused, and the contents are cast on tin plates for cooling, and finally crushed.

Tin in Preserved Food.—With reference to this question, the following information will be of interest: Last year, an English analyst, Mr. C. J. Wishart, detected tin in the juice of different fruits which had been preserved in tin vessels. A quantitative estimation of the amount of tin present in the syrups of various fruits sold in tin cans gave the following results: A 2 lb. tin of pineapples contained an amount of tin equal to 0.21 grain of stannic oxide (SnO_2); a similar-sized tin of green gages, 0.36 grain, SnO_2; of apples, 0.34 grain SnO_2. In addition to this quantity of tin, the first sample contained 0.39, the second 7.22, and the third 15.28 grains of ferric oxide. The two latter samples had a distinctly metallic taste. From examination of the inner surface of the tin can, it was obvious that the syrup of the fruit had acted upon the metal.

A Safety Envelope.—It is well known that an ordinary envelope may readily be opened by moistening the paper over the gum, after which operation, if done neatly, the contents may be noted, and the missive again sealed and sent on its errand. But a perfect "safety envelope" may be made by heating that part of the paper covered by the flap with a solution of chromic acid, ammonia, sulphuric acid, sulphate of copper and fine white paper. The flap itself is coated with a solution of isinglass in acetic acid, and, when this is moistened and pressed down on the under side of the envelope, a solid cement is formed, entirely insoluble in acids, alkalies, hot or cold water, steam, etc.

New Material for Flour Sacks.—A gentleman of Hartford has purchased an interest in the long wire belting patent, and will introduce the material to the grain and flour shippers of San Francisco and to the United States postal department. The material is a woven product with warp of fine iron or steel wire and filling of cotton yarn. Seamless bags can be woven of this material, which will be vermin proof for flour and wheat on the long shipment to Australia or to the western coast of South America, from San Francisco, and be an excellent substitute for the present canvas and leather mail bags.

Stains of oil paint may be removed with bisulphide of carbon; many by means of spirits of turpentine; if dry and old, with chloroform. For these last, as well as for tar spots, the best way is to cover them with olive oil or butter; when the paint is softened, the whole may be removed by treatment, first, with spirits of turpentine, then with benzine.

Good Health.

Is Insanity Increasing?

It is a common saying that an increase in the number of insane persons is one of the necessary results of the intensity of modern life. There is certainly a steady increase in the number of inmates in asylums for the insane—an increase greater than the growth of population would seem to warrant. For this there may be several causes:

1. An actual increase in the proportion of persons of unsound mind in comparison with the entire population.

2. A more general and systematic commitment of insane persons to asylums for protection and medical treatment.

3. A steady accumulation of insane persons owing to the better care of the insane and the consequent lowering of the death rate of such persons.

That the second and third causes are real and potent is amply sustained by the statistics of our public institutions. The proportion of insane persons at large naturally diminishes with the improvement and multiplication of asylums and the growing popular conviction that neither individual nor public well-being is furthered by allowing the insane to go free, uncared for, and without medical assistance; and as a natural result, the number of the insane in asylums increases proportionally.

Accordingly, we may have an increase in the number of annual commitments to asylums, as well as in the number of permanent occupants, without any increase in the total percentage of insanity in the country.

Increased efficiency in the medical treatment of the insane may also seem to increase the number of cases as well as the actual number under care at any time. With unskillful treatment, many cases of acute mania may result in speedy death, or what is worse, chronic insanity. In such cases, the patient counts but once. With better treatment the patient is ultimately, often speedily discharged, apparently or really well. The disease is liable to recur, however, and in the course of years, the same patient may have to be under treatment several times, each time adding one to the statistics of insanity.

Another fact which tells against the theory that "high pressure" living tends to enhance the mind may be found in the source of the larger portion of the inmates of insane asylums. The records of asylums show that most of the insane come, not from the busy professional, mercantile and manufacturing classes, but from those whose lives are a monotonous round of petty drudgery, or, what is equally killing, petty inaction, unfruitful idleness and dissipation. Frivolity probably leads more men and women to the insane asylum than the hardest and intensest pursuit of mental or material wealth.

Advice to Those Using Glasses.

Men engaged in literary pursuits should read most by day and write most by night. It is worthy of note that reading causes more strain to the eye than writing, and that copying work in writing makes a greater demand upon the organ of vision than offhand composition. Twilight and a mixture of twilight and artificial illumination should be avoided for any kind of work. The pale cobalt-blue tint is the best that can be employed when protection for the eye from intense glare is sought, as in the case of traveling upon snowfields in bright sunshine. The green glass that is often adopted for the purpose, is not by any means so worthy of confidence. Reading in railway traveling is objectionable in the highest degree, for a very obvious reason. The oscillation of the carriage continually alters the distance of the page from the eye, and so calls for unceasing strain in the effort to keep the organ in due accommodation for the ever-varying distance of the dancing image. The exact fitting of the framework of spectacles to the face and eyes is of more importance than is generally conceived. If the centers of the lenses of the spectacles do not accurately coincide with the centers of the pupils of the eyes, the consequence is, that the images in the separate eyes are a little displaced from the positions which they ought to hold, and that is somewhat painful and injurious effort has to be made by the eye to bring those images back into due correspondence for accurate vision. An incipient squint is apt to be in this way produced. Mr. Carter recommends that people should look to the centering of their spectacles for themselves. This may be easily done by standing before a looking-glass with the spectacles in their place. If the fit is a good one, the center of the pupil should then appear in the center of the rim. Fully-formed spectacles are always to be preferred to folding frames, because they permit of more satisfactory adjustment in this particular, and because they are more easily kept in the right position with regard to the eyes. The only advantage which the pebble enjoys over glass for the construction of spectacles, is the immunity which it possesses against scratching and fracture on account of its greater hardness.—*Edinburgh Review.*

The Value of Mental Tension.

A certain degree of tension is indispensable to the easy and healthful discharge of mental functions. Like the national instrument of Scotland, the mind drones wofully and will discourse most dolorous music, unless an expansive and resilient force within supplies the basis of quickly responsive action. No good, great, or enduring work can be safely accomplished by brain-force without a reserve of strength sufficient to give buoyancy to the exercise, and, if I may so say, rhythm to the operations of the mind. Working at high-pressure may be bad, but working at low-pressure is incomparably worse. As a matter of experience, a sense of weariness commonly precedes collapse from "overwork;" not mere bodily or nervous fatigue, but a more or less conscious distaste for the business in hand, or perhaps for some other subject of thought or anxiety which obtrudes itself. It is the offensive or irritating burden that breaks the back. Thoroughly agreeable employment, however engrossing, stimulates the recuperative faculty while it taxes the strength, and the supply of nerve-force seldom falls short of the demand. When a feeling of disgust or weariness is not experienced, this may be because the compelling sense of duty has crushed self out of thought. Nevertheless, if the will is not pleasurably excited, if it rules like a martinet without affection or interest, there is no *verve*, and, like a complex piece of machinery working with friction and heated bearings, the mind wears itself away and a breakdown ensues. Let us look a little closely at this matter.—*Dr. J. Mortimer Granville on "Worry," in Popular Science Monthly.*

Sweet-flag Candy.—Sweet-flag candy is relished by all lovers of sweetmeats, and it is a valuable aid to digestion, as it will stop the disagreeable rising of gas, so annoying to dyspeptics. Being eaten greedily by children, it is often better than other medicine. A bit held in the mouth when one is caring for the sick will often counteract the effect of contagious germs. To prepare it, take fresh, healthy roots of sweet-flag, and after a careful washing, cut in slices one-eighth of an inch in thickness. Put them into a stewpan or bright basin, and pour a little more cold water over them than will cover them. Set on the stove and heat slowly; when the water boils turn it off. If the candy is desired for medicine, quite enough of the strength has been removed, but for a sweetmeat it is better if boiled up and the water turned off four or five times. Now measure the sliced roots, and to each two cupfuls allow one and a half cupfuls of white sugar, turn on water enough to cover, return to the stove and simmer slowly, stirring often until the water has quite boiled away; then turn out on buttered plates, and stir frequently until dry. The long simmering after the sugar is added makes the roots quite tender, and the candy will keep nice and fresh for years.—*Country Gentleman.*

If the valley farmers succeed in stopping hydraulic mining, what is to become of the small mountain farmers who depend on the miners to furnish a market for the produce?

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Passing Events.

The copious rains of the season have been of little service to miners, since in most places hydraulicing is temporarily prevented. Where it is not, however, the ditches have run full and the water been utilized. The Gold Run case is still continued at Sacramento, most of the testimony being as to the state of the rivers with regard to debris. Very little of interest to the miners' side of the question has yet been adduced.

Our "Mining Summary" will show what is going on in the various districts.

Our next issue will contain a great many valuable articles, and will be devoted mainly to the interests of Arizona and New Mexico.

Congress has re-assembled; the President has submitted his message showing peace abroad and prosperity at home; the Cabinet officers have presented their tomes of official wisdom, and now we are ready for the winter in Washington, which we trust may not be the "winter of our discontent," as often is the case while Congress pummels public affairs. California has no legislative turmoil this year, but next fall what a royal season there will be for the politicians!

THE Leadville smelters operated upon 3,600 tons ore during the month of October. Estimating the lead at 5c ₱ lb. and the silver at $1.12½ per ounce, the value of the yield for the month was as follows: $964,484.

New Gold Saving Apparatus.

Noah H. Falk, of Arcata, Humboldt county, Cal., has just received, through the MINING AND SCIENTIFIC PRESS Patent Agency, a patent on a new form of gold-saving apparatus which is particularly applicable to the saving of fine or float gold and the particles of mercury also.

In an ordinary sluice is placed a grating or grizzly, through which the finer sand, gold, etc., fall into the undercurrent, and this undercurrent has also a screen, through which the finest sand and valuable portions fall into a common sluice leading them to a hopper, which is the commencement of the apparatus proper.

Just beneath this hopper is a horizontal table or plate, upon which the earth and water fall, and are by it divided and caused to flow off upon each side, where they fall upon two other plates which again subdivide the material and deliver it upon a screen. This screen separates the material into five streams, which fall a very short distance upon horizontal copper or amalgamated plates. The inventor thinks an inch and a quarter fall is sufficient to bring all the particles of precious metal into intimate contact with the plate without producing that tendency to "scour," as it is termed, which a rapid current or high fall will do. From this series of plates the material falls upon a second screen, through which it passes, and is received upon a second series of amalgamated plates also placed horizontally but a small distance below the screen.

This apparatus is all placed in a box which has an inclined bottom, over which the residue passes to a quicksilver trap, where the last remnant of gold may be saved, and from which the useless tailings will escape. The front or side of this box has an inclined hinged door, through which the plate may be removed to be cleaned up or examined at any time. This gate or door is kept locked, the plates being thus kept in a position where they cannot be examined or touched by outsiders.

The theory of the invention is that by thus subdividing the material and allowing it to fall a short distance upon the horizontal amalgamated plates, it will be brought into intimate contact with the surface, and will be caught and saved; and there will be no tendency to scour the plates.

Broadly, the use of distributer-screens combined with amalgamating plates and a quicksilver trap, is not new, but the specific construction and arrangement made by Mr. Falk is novel, and an "improvement" on this kind of gold-saving apparatus.

"Shotgun Dumps."

In some parts of California, along the Trinity river particularly, there are extensive areas of gravel lands or benches 100 ft. or more above the present river, probably the remnants of some great drift period. These are not connected, but lie upon points or heuches of land, their former continuity having been broken by land slides and creeks, which carry a flood bead of water in rainy seasons. Along the Trinity the mountain sides are steep, and not well adapted to the storage of water; therefore, the washing season is short. In order to economize water during the dry season, a singular contrivance is in use on the gravel lands near Trinity Center, which could no doubt be put to effective use in other localities.

It is locally called a "shotgun dump," but perhaps might be better described as an automatic discharge gate. A small, but deep reservoir is constructed at a suitable elevation above the bank to be washed, and the water from the ditch is conducted to it in iron pipes of four or five inches in diameter. At the lower end of the reservoir is a dam and a gate; across the dam is a beam, one end of which is attached to the gate, and the other, or lower end, has suspended to it a water box, with a valve in the bottom.

This box is suspended over the water flume, which carries the water to the mines. Water from the pipes is discharged into the reservoir. When it is full to overflowing the surplus water passes through a narrow box over the face of the dam into the suspended box, which is so gauged in size and weight, that when full it pulls down the beam and thereby raises the gate, permitting the instantaneous discharge of the contents of the reservoir with great velocity.

The valve of the suspended box drops upon an upright post; its waters are also discharged when the gate on the other end of the beam falls by its weight; the empty box rises and the process goes on indefinitely. This result is a sudden sluicing of the flumes at intervals of a few minutes with a heavy bead of water.

PRISON LABOR.—At a mass meeting held by the Trades Assembly this week, resolutions were adopted that the State Prison Directors' purpose of converting the penitentiaries of California into great manufacturing establishments was in violation of the spirit and intent of the Constitution, unjust to those who are endeavoring to establish mechanical industries on this coast, and likely to become a cause of oppression and degradation to the free white laborers of the State. A suitable protest was made.

Arizona and New Mexico.

Both these great southern Territories are now attracting a very large share of attention, not only of settlers, but of miners, capitalists, railroad men and others interested in developing the wealth of comparatively new regions. Railroad plans are being perfected, surveys made, roads built, and plenty of work is being done. People interested in agricultural pursuits are looking anxiously that way for the opening up of new sections where they may locate and where they will have transportation for their products.

The prospectors and miners, however, so far make up the bulk of the people now interested in these Territories. Arizona makes a glorious showing in the ranks of the bullion producers, and her mines are constantly on the increase both in number and yield. New Mexico is only now beginning to have any mining interests and her mines are not so well known. Yet there are large areas still unprospected and capital is now going in to help those who are developing the country.

We have from time to time given considerable space in our columns to articles descriptive of these two territories and their resources. Our next issue, Dec. 17th, will be devoted very largely to their interests. We shall print an enlarged edition of 24 pages, fully illustrated, and with a number of exceedingly interesting and valuable articles. We have collected considerable information of interest to the mining community, and can promise that our Arizona and New Mexico edition will be well worthy of perusal and preservation.

NEW TYPE OF LOCOMOTIVE.—The increase of local traffic between the Oakland wharf and Oakland, Berkeley, Brooklyn, and Alameda has necessitated the building of a number of new locomotives. Seven fine locomotives are now being built in the Central Pacific shops at Sacramento. The Sacramento *Record-Union* says: The frames of all are made, three have been set up, and one is nearly completed. They are of an entirely new pattern, and the plan of their construction is with a view of placing nearly the entire weight of the engine and tender upon the driving wheels, so as to give strong tractive power, and thus procure greater facility in starting and stopping the heavy trains of the Oakland lines. The real object sought is to construct the engines as to give them the utmost possible power in the way of making quick starts and stops while drawing heavy loads. To accomplish this no separate tender is used, but the fuel is carried upon the rear portion of the engine itself, which is extended back in the shape of a coal-bunker a distance of about seven feet, and which gives capacity for three tons of coal. The water tanks are placed upon the sides of the engine, and extend back nearly to the rear end of the coal-bunker. They will hold from 1,200 to 1,600 gallons. The engines are built double-enders, with a pilot front and back, so that they may be run forward and back upon the lines without changing ends. They are also arranged with accommodation couplers for high or low-built cars. The total length of each engine is about 40 ft. They stand upon six small drive-wheels, 50 inches in diameter, and with two leading and two trail wheels 26 inches in diameter. The weight is nearly all upon the driving-wheels, and will be about 50 tons when running.

SIXTEEN SIGNAL PROFESSORS.—A bill will soon be introduced in Congress for the betterment of the signal service, which provides for an increase of officers and men, and for the appointment by the President, with the advice and consent of the Senate, of three professors and 13 assistant professors, preference being given to those persons of high scientific attainment, especially in the science of meteorology, who, by long experience in the Signal Service and in the service of the United States, have shown a peculiar fitness for meteorological and allied science work.

DRIFTING VS. HYDRAULICING.—It costs from one to two dollars a cubic yard to work gravel by the drifting process. Experience has shown that the yield per cubic yard from some of the hydraulic claims in Nevada county in round figures is as follows: American mine at Sebastopol, 24 cents; Blue Tent mine, 15 cents; North Bloomfield mine, less than 10 cents; Milton mine, 33 to 47 cents; Manzanita mine at Sweetland, 27 to 33 cents.

JOHN SULLIVAN, a man employed in the Standard mine, Bodie, in going for a bucket of water, deliberately walked out of the 400-ft. level and fell to the 1100-ft. level of the mine. He was 27 years old, and this was his first day's work in a mine.

ARTHUR F. PRICE, son of Prof. Thos. Price, of this city, passed successfully at the annual examination of students of the Royal School of Mines, London, England.

The Chemical Composition of Slickens

The San Francisco citizens' committee which recently made an examination of debris destruction, brought back with them samples of slickens, which they submitted for analysis to Prof. Hilgard, of the College of Agriculture. Prof. Hilgard has made his examination and reported thereon to Mr. Gordon, Sec'y of the committee. What use the commities will make of the report, it will be for them to determine. As the subject is of great public interest, we have secured from Prof. Hilgard the privilege of looking over the results attained in his study, and the conclusions he draws therefrom.

After analyzing the samples of slickens furnished by the committee, Prof. Hilgard adduced the result of other analyses he had made of similar material obtained elsewhere, and compared them with a sample of alluvial soil from Dixon, Solano county. This sample of alluvial soil was taken because Prof. Hilgard had no complete analyses of the alluvial soil which underlies the slickens. This will, of course, be the proper comparison to make, to show how the covering of slickens compares with the rich soil which it has buried out of sight. Such a comparison will no doubt be made ultimately, but for the present the Dixon analysis is used. The following is a description of the samples and their composition.

No. 1. Sample of "slickens" furnished by Secretary of Citizens' Debris Committee.

No. 2. Clayey "slickens" from Alger's Bend, Feather river, furnished by Julian Le Conte, of the U. S. River and Harbor Survey.

No. 3. Mining slum covering adobe land near Mt. Pleasant, Tuolumne county, coming from the hydraulic mines of Mt. Pleasant and Montezuma. Furnished by Mr. John Taylor, of Mt. Pleasant.

All these samples are of a pale yellow or ochreous tint; Nos. 1 and 3 are tolerably easy to crush between the fingers, and contain scarcely any sand, being a close, fine silt. No. 2 formed hard lumps of very fine texture, and when exposed to the sun in the river bed, had formed great gaping cracks.

No. 4. Soil from Dixon, Solano Co. Sent by J. M. Dudley, Dixon.

	No. 1. Com. Slickens.	No. 2. Feather River.	No. 3. Mt. Pleasant.	No. 4. Soil Dixon.
Insoluble matter..	72.17	61.03	73.00	07.33
Soluble silica.....	3.07	8.03		3.07
Potash.....	.27	.30	.10	.93
Soda.....	.03	.12	.21	.12
Lime.....	.79	.52	1.10	.77
Magnesia.....	.87	.77	2.32	2 29
Br. oxide Manga'se	.03	.00	.08	.11
Peroxide of Iron..	6 58	0.50	9 30	8.01
Alumint.....	10.42	14.23	10.55	9.16
Phosphoric acid...	.08	.08	.08	.11*
Sulphuric acid....	.13	.07	.03	.12
Carbonic acid.....	.....	.....	.....	.....
Water & org. matter	5.72	8.02	4 43	7.11
	100.15	99.85	100.36	09.73
Humus.....	Trace	Trace	.42	1.71
Available Inorganic	.....	.....	.36	.56

*This is unusually low for an alluvial soil, 20 to 25 being common percentages.

Prof. Hilgard comments upon the above results as follows: First, as to the chief elements of plant food, as compared with the Dixon soil, and still more as compared to alluvial soils elsewhere, the slickens samples are deficient in phosphates and in potash, but all seem to contain a satisfactory, and even large supply of lime. In humus, however, and therefore in nitrogen, they are altogether deficient—so much so, that a quantitative determination was not attempted in the case of Nos. 1 and 2. No. 3 had been cultivated for some years, plowing in weeds, etc., and thus had acquired a small supply of humus, but less than half of what is ordinarily adequate in such soils. It therefore fails to yield paying crops.

This, in fact, is the "key to the situation." Considered only with respect to the percentages of mineral plant food present, the mine slickens materials analyzed would represent third-rate, and perhaps sometimes even a somewhat higher class of soils; but the absence of humus or vegetable mold leaves these ingredients in an unavailable condition. It is a crude, unthrifty material, and many years must elapse before this state of things can be changed by the slow processes of nature. Practically, the farmer having land covered with "slickens" of this kind, will, for some time to come, like the European cultivator, be subject to the maxim: "No manure, no crops." By diligent cultivation, green manuring, etc., such soil may, in the course of 15 or 20 years, become able to contribute something to the nutrition of crops from its own store of plant food. This, of course, refers to cases in which the finer materials have been alone deposited, and not accompanied by floods of sand or gravel, which at times forever destroy the value of the land.

It has sometimes been noticed that certain lands were improved by the flowing in of a coat of slickens that had covered the surface to the depth of a few inches. This may occur in adobe soils, whose tilth, and in the case of gray adobe, even intrinsic productiveness, may be furthered by such addition.

ANOTHER FOUNDRY.—A petition has been filed with the Supervisors by Nuttall, Bacon & Co., announcing their intention to start in the machine shop and foundry business on Fremont street, and asking permission for the erection and maintenance of a steam engine, boiler and cupola.

EWAN GRIFFITH, a Welsher, and who prospected the Yuba river to the forks—Downieville—and discovered diggings in the vicinity of the City of Six, Sierra county, and erected the first cabin at that place, died last week. Of late years he has been farming, and died very wealthy.

Lecture to Young Mechanics and Apprentices.

The following is a report of the lecture delivered in the hall at McNevin's Nautical School last week by Capt. Wm. A. Phillips:

The Properties of Steam.

The architect who undertakes to erect a building, or the mechanic who constructs an engine, without first obtaining a full knowledge of the properties and nature of the materials used in such building, is almost sure to fail; and the engineer who takes charge of a steam engine, or uses steam for any purpose in mechanics or manufactures, should first acquaint himself with its nature and properties. And in order that we may the more fully understand the nature and properties of steam, it may be necessary, in those few brief remarks, to touch upon its natural chemical composition and properties in a general way.

Water is looked upon by many as a common and simple element; and the mode of converting it into steam is known by every school boy of the present age. Not so with its constituents and properties when in the gaseous form. Analization of steam, such as is usually generated in the ordinary steam boiler, has yet to be made, and in consequence many vague theories and ideas are advanced.

Ice, water and steam are one and the same substance, only of different degrees of temperature. Then, evidently, temperature gives different properties to the same substance. The highest point to which ice can be raised and maintained as ice, is 32° F., but the highest to which water and steam can be raised, is not known.

We know that at atmospheric pressure water evaporates into what is known as steam, at 212°, and above or below that point in accordance with the pressure to which it is subjected, and in proportion to the units of heat applied. Steam and water can exist in their respective forms at all temperatures, above 32° F., and, in fact, steam is known to exist much below the freezing point. It may be necessary for me to say here that I make no distinction between what is called vapor and steam; in fact there is none, except temperature.

If the temperature of the air should fall sufficiently below that of the water in our bays or rivers, steam will be emitted from their surfaces, and become visible when condensed in the colder atmosphere. Steam can be condensed from the atmosphere by any cold substance being placed in it. A pitcher filled with ice will illustrate it.

Steam is emitted from our bodies at nearly the same temperature as the air. To prove this we have only to breathe on a piece of cold metal or glass, when condensation ensues and the water can be easily collected. When the atmosphere is much colder than our bodies this steam is made visible by condensation, and when the temperature is sufficiently low, has been frozen into ice upon the beard. I have said here that steam was made visible, but when visible it is no longer steam, but minute globules of water of infinitely small proportions, which, by their attraction for each other, under favorable conditions, form drops and fall in rain, or are evaporated again and carried off in the thirsty atmosphere.

Pure Steam

Is composed of two volumes of hydrogen and one of oxygen; or, by weight, one of hydrogen and eight of oxygen. If two cubic ft. of hydrogen and one of oxygen are united, they will form only two cubic ft. of steam, or a volume equal to that of the hydrogen and equal in weight to both. (Two parts of nitrogen and one of oxygen combined to form protoxide of nitrogen, produce the same phenomena.)

Steam is three-eighths lighter than common air. An atmosphere of pure steam would only weigh a little over nine pounds, yet water, of which it is composed, is 770 times heavier than air (although it is principally composed of hydrogen, the lightest gas known), it being in weight as 1, nitrogen 14, and oxygen 16. The fall of the barometer indicating a coming storm, also indicates an excess of aqueous vapor or steam in the atmosphere, the air being lighter by the amount of steam contained in it. Before passing further on this subject, it may be necessary to make a few remarks in regard to some of the

Instruments Used in Measuring Heat.

The thermometer, being the instrument generally used for measuring degrees of heat, might be more properly termed degrees of expansion and contraction in the liquid or metal used in its construction. Quantity of heat cannot be ascertained by it, although indicated by the expansion of the material of which the thermometer is composed, to be either more or less intense. Assuming that the metal or fluid used in its construction always expands in proportion for each degree or unit of heat, we have a measure, but not theoretically correct.

The Calimometer,

Or thermal pile, is the most sensitive instrument in use for measuring minute differences in temperature, and shows the sensitive action of heat upon electrical bodies. This instrument will not indicate quantity, but will indicate or detect the presence of heat, though insensible to the ordinary thermometer. You will observe the distinction between quantity and intensity.

The Calorimeter,

As used by Laplace, is a device for measuring quantity. It is simple, yet ingenious; it consists "of a glass vessel having two annular chambers, the inner one to contain the liquid or material to be tested; the other two chambers to contain pounded ice; the outer chamber of ice to prevent the action of the heat in the surrounding air from acting on the ice in the middle chamber." The quantity of heat is then obtained by the quantity of ice. The substance under test will dissolve in the middle chamber, and can be ascertained by the weight of water thus collected from the ice in the middle chamber; yet this will not give accurate quantity, as all the ice thus dissolved cannot be collected, a portion of the water being retained in the ice by capillary attraction, even though no heat were lost while conducting the operation. From such defect or imperfections arise the discrepancies of different experimenters; for example, "Watt gives the latent heat of steam at one atmosphere as 988°; at 10 atmospheres as 840°." Watts' rule or theory being that 1,200° is the total heat contained in saturated steam, and that as sensible heat increases latent heat diminishes. "Southern gives the latent heat as constant at 950° at all temperatures." "Lavoisier at 1,000°, Rumford at 1,009°, Regnault at 966°."

In measuring the quantity of

Heat Contained in Steam,

The ordinary thermometer is useless. An approximation to quantity is made by the following: One cubic inch of water generated into steam contains sufficient heat to raise the temperature of 5½ cubic inches from 32° F. to 212°, making in all, when condensed, 6½ inches of water at 212°; yet the steam only indicated 212°. Hence, if we multiply 6½ by 212°, and deduct the 32° contained in the 5½ inches of water, we will have 1,202° as the amount of heat obtained from 1,700 cubic inches of steam, or the amount necessary to evaporate one cubic inch of water into steam, yet the steam will indicate, by the thermometer, as having only received 108°, when, as shown by the above calculation, it has received 1,170°, and yielded up to the 5½ inches of water 990°.

If we follow the subject a little further, we will find that this heat was diffused throughout 1,700 cubic inches of space occupied by steam—and here quantity takes the place of intensity—each atom of steam requiring its unit of heat to hold it in the gaseous form; for if one atom should lose its required unit of heat, it would be no longer steam, but would become water, and perhaps carry several of the surrounding atoms with it to the liquid form. If we could compress the 1,700 cubic inches of steam into one-half its volume without loss by radiation or condensation, we would find an indicated increase of temperature of 38°, and it would continue to increase as the volume was reduced.

The same theory holds good in regard to air when compressed. Water at the boiling point (atmospheric pressure) cannot be made to indicate any higher temperature than 212°. No matter how intense the heat applied, an increase of ebullition is all indicated until the volume of water is all evaporated. It is during this period that the seemingly lost heat is carried off into the increased space occupied by the steam.

Dr. Black says that "the same phenomena or apparent loss of heat takes place whenever a solid melts as well as when a liquid boils; and, on the contrary, a precisely equal apparent heat is produced or restored when the same liquid solidifies or the same vapor liquifies." The same author found it required 10 times the weight of ice in water—14° warmer than itself—to melt it.

Rumford says that "steam contains heat enough to raise 10 times its own weight of water, 102°, or 102 times its weight, 10°." Water is the greatest absorbent of heat of any known substance. If we take equal weights of water and iron, and raise them to the same temperature, it will be found that the water contains 10 times the amount of heat.

The heat required to

Raise One Pound of Water One Degree

Will raise 4½ lbs. of air the same hight; again, if one lb. of mercury be heated to 160° and one lb. of water to 40°, and mixed or mingled together, they will give a temperature of 45°, but if the water be heated to 160° and the mercury to 40°, and mingled together, they will give a temperature of 155° The 5° taken from the water will indicate an increase in the mercury of 115° On the other hand, the 115° taken from the mercury will only indicate 5° in the water; showing that different bodies have different capacities for heat.

Water, although the greatest absorbent, is a poor conductor of heat. It can be boiled in a vessel only a few inches in depth and emit steam from its surface without materially increasing its temperature at the bottom.

Steam is an Excellent Radiator.

The ease with which it gives out its heat is of great annoyance to the engineer, and also of great service in the steam engine by its rapidity of condensation. Many devices have been resorted to to prevent its radiation, such as jacketing and superheating it in the boiler. Superheating has been applied in various ways, and the poor conductive property of steam makes it possible to have steam at different temperatures in the same boiler, unless a very active circulation is kept up.

If pure steam be superheated beyond the point of loss by radiation, it becomes subsaturated or surcharged with caloric and acts upon the iron of the boilers and engine with a deleterious effect. Oxydizing the same, when superheated or sub-saturated, its absorbing properties are increased, on account of its inclination to become saturated or attain its normal condition.

If expanded in a cylinder, it will take up a portion of the water that may have been formed by contact with the colder surface of the engine. When expanded, it falls in temperature, and it follows that the pressure being reduced, the boiling point is also reduced, which allows the greater portion, if not all the water so formed, to flash back into steam, it having obtained the same temperature as the steam at its highest pressure. A sudden ebullition, which sometimes produces what is called priming, is caused by the same law of pressure regulating the temperature of the boiling point; for water can be heated to any degree to correspond with the pressure applied of its own vapor, and might be so confined as not to evaporate at all.

In the "Cyclopedia of Useful Art," it is said M. Cagnard de la Tour made some experiments with steam. He heated water in a strong glass vessel, in a little over four times its own space, to a temperature of 700°, or nearly that of melting zinc, when which the experiment was prevented by the solvent power of the liquid becoming so increased as to attack any kind of glass. The solvent property of fresh distilled water is known to produce the brown substance found in pipes and on the tubes of boilers using it, causing what is termed

Pitting of the Iron.

This brown product by analization is found to contain 79% of the oxide of iron and 15% water, with 1% of silica. Steam having similar properties as that of the distilled water, when superheated, acts still more powerfully on the iron of the boiler, superheater or engine; and because of this corrosive property in surcharged steam, superheating to any extended degree has been abandoned by many engineers.

J. W. Nystrom, an eminent engineer, explains superheating thus: "In order to utilize the maximum effect of steam, it is not necessary to overheat it. After a pure steam is formed, that is, when all the particles and bubbles of water are evaporated, water which accompanies the steam in such a form has the same temperature as that due to the surrounding steam pressure, preventing it to vaporize, and when it passes through the superheater, the temperature is greatly increased, while the pressure remains the same.

Expansive Qualities.

"It being in connection with the steam room in the boiler, allows the water to vaporize, and a pure steam is formed. If particles of water with the steam is admitted into the cylinder part of the stroke and then allowed to expand, it is generally found that the end pressure does not come up to that due by theory, from which it has been pronounced that the expansive quality of steam does not follow that of a perfect gas; but if we know the cubic content of all the particles of water, and subtracted that from the cubic content of the steam, it might be found that its expansive quality is not so far from that of a perfect gas." He further adds: "It appears, also, that the expansive quality is diminished by overheating pure steam," but assigns no reason for the opinion. We desire here to call attention to the fact that the relative

Volume of Steam to Water

Is not the same at all pressures, or reduced in proportion to its pressure, according to the law of gases. For instance, if we take steam at 1,700 cubic inches to 1 of water (pressure of one atmosphere), at two atmospheres we should have only one-half that volume, and at four atmospheres, one-fourth the volume; at eight atmospheres one-eighth, or 212 5 inches, when in reality we have 251 inches at eight atmospheres; the increased volume being due to the increased temperature at those pressures.

Steam, like its mother element, being a poor conductor, makes it necessary to cause nearly all the atoms of steam to come in contact with the heating surface of the superheater to give it a uniform temperature; and to accomplish this, superheaters have been made with flattened tubes; others with angular pipes, and in every conceivable form; many of them acting as refrigerators when placed in the uptakes of boilers, from the low temperature in them and the frequent admission of large drafts of cold air when the furnace doors are opened. It may not be amiss to say here

What We Mean by Pure Steam.

It is the vapor of water, free from watery particles, all foreign substances or other compound gases than oxygen and hydrogen, and of a temperature equal to the pressure under which it was produced. Sub-saturated steam is that which has received a higher temperature than that under which it was evaporated, and it can be raised to any degree of heat the vessel will endure in which it is contained, its absorbing properties becoming greater with each degree.

The changing properties of water and steam by heat might naturally make us inquire

What is Heat?

Is it matter that can chemically combine with matter? If without substance, how does it combine with matter to change its properties.? Tyndall, the great author on this subject, says, "it has no substance;" he calls it motion—"atomic motion." And if it is so, increase of heat is simply increase of motion; but in melting ice or evaporating water into steam this atomic motion is peculiarly arrested.

If it were not so, why should not all fluids evaporate instantaneously when reaching the boiling point? However, in this subject it is enough to know its existence in steam, and that it imparts different properties to it at different temperatures, or "when the atoms have reached a certain velocity," as Tyndall would say.

(To Be Continued.)

Mining Affairs in Nevada County.

The owners of mines in this vicinity, says the Nevada *Transcript*, refuse to give the daily, weekly or monthly clean-ups for publication, and that is why Nevada City is not much thought of by capitalists abroad. Men who have money to invest in quartz mining naturally ask, "Is there any good-paying quartz mines in Nevada City?" When the answer is given them in the affirmative they say, "We never hear of regular shipments being made from any particular mine in that section." That ends the matter, for no one, outside of the owners of each particular mine, can give any positive information. If such mines as the Providence, Merrifield, Wyoming and a dozen others would permit the publication of each shipment, Nevada City would increase in prosperity, for capital would surely be attracted to our known rich quartz belt, and many mines that are idle now would change hands and be worked. There are really enough quartz mines in this vicinity to give employment to thousands of men, if they were only once opened. Our people have not got the capital to work them, and if no encouragement is given to capitalists to come here they are bound to stay away, and the mines remain unworked. The Providence, Merrifield, Wyoming, Nevada City and a number of others that we might mention will compare favorably with an equal number of mines on the coast. The shipments made by these companies are large, but are all owned by private individuals who do not care to have any one know anything about their business. They pay their bills promptly, and that is all they care to give to the public.

Robinson Mine.—A dispatch from Denver, Col., to the Amantia *Press* says: The truth about the condition of the Robinson mine has been so successfully concealed that the cause of its depression is now for the first time understood here. Considerable indignation is exhibited also at the open misrepresentation of the mine by local officials. It transpires that the rich ore has all been exhausted, and what is left does not pay to treat.

A Useful Paper.—The Mining and Scientific Press of Nov. 19th is an excellent paper, full of information that is valuable to everyone. It contains 10 pages of solid reading matter, besides several pages of advertisements affording references to the various mechanical pursuits and manufactories. Every miner, engineer and mining operator and intelligent mechanic ought to take this paper. It is published weekly by Dewey & Co., 252 Market street, S. F., at $4 per annum.—*Mariposa Gazette.*

Successful Porphyry Mining.—Henry Barnes, at a point a short distance north of where the old Mountain House formerly stood, between El Dorado and Shingle Springs, El Dorado county, has for some time been working the porphyry seams of that vicinity with much success. The pay has been more regular than is usual in such diggings, and at a comparatively trifling expense Mr. Barnes has taken out between $3,000 and $10,000.

John H. Kickham, one of the men wounded at the powder explosion in the Great Sierra hoisting works in Mono county, being evidently about to die for want of proper medical attention, was placed on a stretcher and carried by five men a distance of 11 miles, to Lundy, where a competent physician resided. The journey lasted from daylight until dark, and involved an ascent and descent over mountain ranges of fully 12,200 ft.

One of the first works for Congress should be to give Alaska a territorial government. The present difficulties of explorers and prospectors going there, are very great and vexatious. Nature has thrown obstacles enough in the way, and the Government should afford them every facility. There is a great future for that region, and men are eager to enter it.

The Nevada *Transcript* of Dec. 4th says: We saw at Phil. Richards' banking house yesterday a beautiful "brick" of solid gold, valued at $3,000, which had just been melted by J. J. Ott, the assayer. As usual, the owners requested no mention to be made where it came from.

There are 25 men working at the Mayflower mine in Bristol district, Nev. Add to this some 10 or 15 men prospecting and doing assessment work, you will have the full number of men working in the mines of that district.

About 20 miles north from Bridgeport, Mono county, in a locality known as the Sweetwater Mountains, quite an excitement prevails over the discovery of very rich and extensive silver mines.

The little three-stamp mill erected in Golden Basin district, Nev., cleaned up in 10 days' run, from 60 tons of ore, $2,052.

The Grand Central Mining Co. of Tombstone, Arizona, has paid four dividends, amounting to $200,000.

During the month of October the Iron Silver Mining Co. of Leadville produced $101,888.

THE FRANKLIN GIRDER!

BY FAR THE MOST ECONOMICAL OF ANY CONSTRUCTION MADE.

—o—

This new and economical Girder for Buildings and Bridges, made of any desired length and to sustain any required load, and guaranteed to be fully up to the sustaiuing capacity represented. The price of these Girders is ABOUT ONE-HALF the price of those of same length and same sustaining capacity in common use in this city. The value of this invention has been most favorably commented on in full by most of the scientific press of this country, as the SCIENTIFIC PRESS, *Scientific American, Railway Review, The California Architect and Building Review, The American Architect and Builder.* A Girder 25 feet long, made for 17-inch wall, with abont 2 feet of brick wall on it, is now in front of premises 231 First St., above Shot Tower. This Girder held on the top of the hrick wall now on it, 117 Tons and 1,741 Pounds of Railroad Iron, at the Pacific Rolling Mills, piled directly over and hetween supports, and it would have held, in the opinion of experts 200 tons, as the deflection was not a quarter of an inch helow the true arc. The foundation on which the Girder reatsd, settled 7 inches, so that the loading had to be stopped at the above weight.

The Price of these Girders, 25 feet Long, to Sustain 100 Tons as a Safe Distributed Load, $200.

THOSE IN COMMON USE NOW IN USE IN THIS CITY COST NOT LESS THAN $400.

And otber sizes in like proportion. Every Girder guaranteed to sustain the load as a safe one; the breaking load heing three times greater.

Prices for any Size and Sustaining Capacity given on Application.

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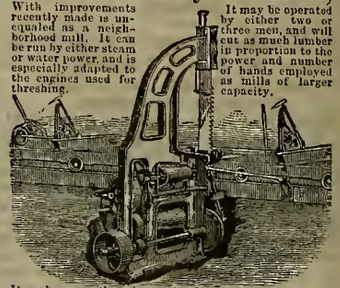
Portable Mulay Saw Mill,

With improvements recently made is unequaled as a neighborhood mill. It can be run by either steam or water power, and is especially adapted to the engines used for threshing.



It may be operated by either two or three men, and will cut as much lumber in proportion to the power and number of hands employed as mills of larger capacity.

It makes smooth and even lumber, leaves no stubshot, and will cut any sized log up to four feet in diameter. It may be transported from one locality to another and re-erected ready for sawing in from two to three days, and can be made profitable in localities where there is not sufficient timber to justify the erection of a large mill. Send for descriptive circular, prices, etc., to
CHANDLER & TAYLOR, Indianapolis, Indiana.

We also build the heavy Standard Circular Saw Mill, with either one or two saws as well as the Pony Circular Saw Mill that is capable of heing run with light power, We also build Stationary Engines of varied capacity; also, portable Threshing Engines.

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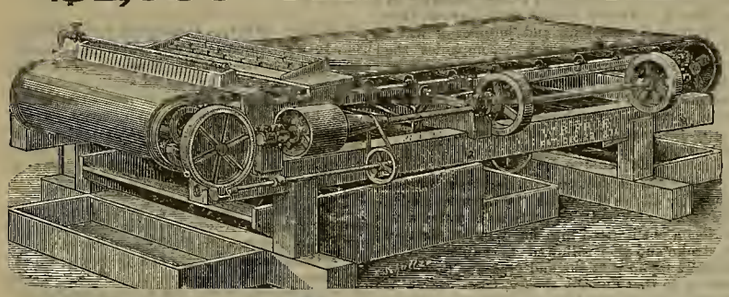

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Saves from 50 to 100 per cent. more than any otber Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.

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☞A machine with all improvements can be seen in working order and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont street.

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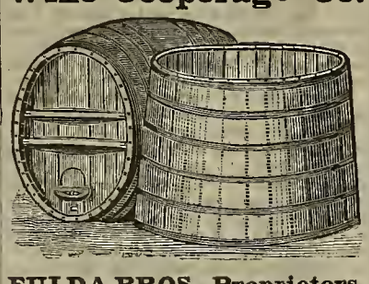

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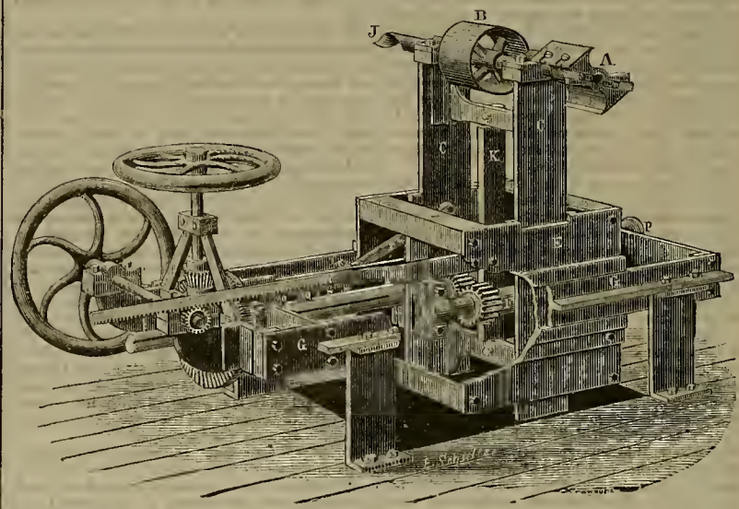
LEPLEY'S FRAMING MACHINE.



The above cut represents the Framing Machine invented by ISAAC LEPLEY, of Amador City, Cal. For perfection and rapidity of work it has no equal. Any form of cnt, tenon, mortise, gain or lovetail in timhsr of any sizs can be made with exactness, and as rapidly as desired. It is complete in all its parts, ready for the helt. The machine is simple in construction and can he run by anyone of ordinary ability. Every mine requiring timhsr, and all mills where much framing is to he done, should have one, as a matter of economy. It will do the work of twenty men.

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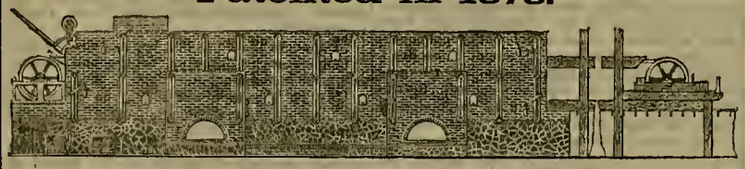
THE O'HARRA
CHLORIDIZING FURNACE.
Patented in 1878.



SIDE ELEVATION OF THE O'HARRA FURNACE.

This Furnace is Constructed with two SEPARATE HEARTHS, one for DESULPHURIZING and one for CHLORIDIZING the Ore.

BOTH PROCESSES ARE PERFORMED AT ONE OPERATION.

—o—

An endless chain carrying conveyors or scrapers passes continuously through over both hearths, going one way through one chamber and the other through the other chamber. By this means the ore is fed and discharged at the same end of the furnace.
A cheap Furnace to build and to run.
The process is essentially the same as the well-known Freiberg process; but the mechanical devices applied to the furnace and the peculiarity of its construction enable the inventor to thoroughly desulphurize and chloridize the ore to a higher percentage than other furnaces, and with less cost for fuel and labor.
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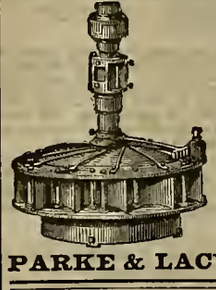

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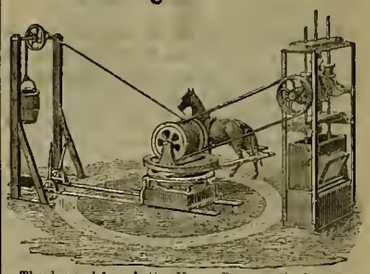

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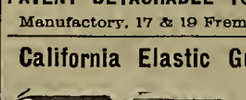

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING NOVEMBER 29, 1881,

250,191.—SAWING MACHINE—David Berry, Bolinas, Cal.
250,199.—DIRT PULVEIZER—Jos. H. Burd, Crows Landing, Cal.
250,137.—TIE FOR SUPPORTING HEADER JOISTS—B. F. Ellis, S. F.
250,261.—ORE CONCENTRATOR—S. Kendall, S. F.
250,070.—REGULATOR FOR STEAM PUMPS—H. Kessler, S. F.
250,275.—TWO WHEELED VEHICLE—S. W. Metcalf, Santa Rosa, Cal.
250,223.—GOLD SAVING APPARATUS—N. H. Falk, Arcata, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

ORE CONCENTRATOR.—Stephen Kendall and L. W. Beauman, National Iron Works, S. F. Dated Nov. 29, 1881. No. 250,261. This is a percussion table concentrator. The improvements consist in providing at the upper end of the table a laterally extending depression or receptacle, provided with a removable perforated cover, the water being led into this receptacle by suitable means, so as to flow upward through perforations and onto the surface of the table, meeting the ore, which is moved toward the receptacle by the peculiar jar imparted to the table. The sulphurets, or other heavy concentrations which are caught in the receptacle or depression by dropping through the perforations, may pass off through a pipe or tube in the end of the receptacle; but the opening of the discharge pipe being a short distance above the bottom of said receptacle, the heaviest of the concentration, such as amalgam, floured quicksilver, etc., will remain in the depression and not pass off with the sulphurets. In this way a double concentration is effected at the one operation, the sulphurets being separated from the gangue, and the amalgam being separated from the sulphurets. This concentrator, which we have recently illustrated, is at work in several places, and is giving, we are informed, good satisfaction.

DIRT PULVERIZER.—Joseph H. Burd, Crow's Landing, Stanislaus county, Cal. No. 250,199. Dated Nov. 29, 1881. This invention relates to that class of agricultural implements known as "dirt pulverizers," the object of which is to thoroughly break up the soil to render it suitable for planting. The invention consists of a framework on which is supported a secondary frame carrying teeth, said frame having a vertical adjustment by means of a lever. Following these teeth is a roller forming the rear bearing or rolling gear for the device. It has on its surface a number of triangular teeth, which are intended to cut up the earth which the forward teeth have smoothed and scraped. A scraper set over the roller keeps the teeth of said roller clean, and appropriate scrapers keep the teeth in front clean. Minor details of construction complete the invention. The device is intended to follow any kind of a plow, pulverizing the dirt turned up.

TWO-WHEELED VEHICLES.—S. W. Metcalf, Santa Rosa. Dated Nov. 29, 1881. No. 250,275. This invention covers improvements in two-wheeled vehicles, and it consists in a novel manner of mounting or attaching the seat to the frame or body, the object of which is to overcome the forward and backward or jerky motion, communicated to the seat by the movement of the horse. It also consists in a removable rack attached to the frame, the design of which is to conveniently carry necessary articles. These improvements will be more particularly applicable to what are known as "breaking carts." The inventor has assigned interests to Phœbe Metcalf, Amelia Thompson and Helen Southwick, all of Santa Rosa.

SAWING MACHINE.—David Berry, Bolinas. No. 250,191. Dated Nov. 29, 1881. This invention relates to a new and useful device for sawing wood, and it consists of a main frame having a supplementary sliding frame containing a saw, which, by being moved back and forth with rapidity by means of a crank wheel, is caused by its own weight to cut through a piece of wood held suitably under it. There are minor details of construction for the complete operation of the device, but they would hardly be well understood without engravings.

THE Pioche *Record* says: Persons on the outside will do well to listen to our warning and not come to this vicinity in search of employment. There is a sufficient number of men here at present to do all the necessary work in and around the mines.

[Advertisement].

More About Water Supply.

The demand on us for information has recently become so great that we are unable to reply to the letters daily received, and we have thus found it necessary to publish this additional circular, and to provide the means for meeting the demands of those who desire wells for domestic, stock and other purposes. As a large demand for the *points* used in the construction of the driven wells has recently arisen here, it has occurred to us that many of them are being put down without authority or license. *The purchase of the point does not give the legal right to put down and use a well.* The driven well is the invention of Col. Nelson W. Green, of New York, and is secured to him by letters patent No. 73,425, No. 4,372 (re-issued) and No. 218,875. These patents have been exhaustively litigated in the U. S. Circuit Courts, in the States of New York, New Jersey, Massachusetts, Iowa and Minnesota, and in every instance decided in favor of Col. Green. Because of the immense value and utility of these inventions, combinations of large means and influence have been made at different times to defeat the collection of royalties and licenses. In one of these cases reported in 13th Blatchford, page 208, 19 days were occupied by the most able counsel in the argument, and over 3,000 printed pages of evidence and briefs were before the court on behalf of the plaintiffs alone, and the expenses of the suit were over $100,000. The opinion was prepared by Judge Benedict, and completely established Col. Green's claim at every point. Judges Dillon, Nelson and Blatchford have all rendered opinions to the same effect; and in a hundred other cases, arising out of collateral matters, have the title and right of Col. Green been most fully sustained. Our object in making these statements is to

Caution

All persons against the use of the driven well without authority, and to say that no person or persons have the legal right to put down or use a driven well in California without authority or license from us. We are the exclusive agent and attorneys of Col. Green, for the States and Territories west of the Rocky Mountains, and intend to enforce and protect his rights, as well as our own, to the uses and benefits of these patents. Should any person offer to put down a driven well for you, request him to exhibit his authority from us, and if he is not able to do this, you may rest assured that you will be required, sooner or later, to pay license to us.

To answer the constantly increasing demand for information, to guard against

Fraud and Imposition,

And to supply the orders as fast as they may arrive, we have made arrangements with the well-known house of

Huntington, Hopkins & Co.

To keep on hand all materials necessary for the construction of these wells, which will be shipped by them on receipt of the price stated. Upon the receipt of such order by them, or us as stated below, a full and minute letter of instructions as to the manner of constructing these wells, will also be sent, so that anyone of ordinary sense can put them down as perfectly as those especially engaged in the business. This letter of instructions—*together with the license*—will be sent with the goods. The articles sent will include everything necessary to a complete and perfect well, and also a pump of sufficient capacity to deliver 900 gallons of water per hour. Without this letter of instructions, and careful attention to the directions it contains, it is more than likely that the attempt to put down a satisfactory well would fail, and thus the goods furnished would prove a partial loss. In adopting these means of putting the driven well within the reach of everyone, the expenses of employing an expert, so called, are avoided, and the cost of the well is thereby so reduced as to be within the reach of everyone. One of these wells can be easily constructed by two men in two days—usually in one day—to a depth of 50 ft.

Where several wells are required in the same neighborhood, the work can be greatly facilitated by purchasing a few additional tools, costing not over $20. These may be returned to us, if not broken, and one-half of the purchase price will be refunded.

When desired, we will send an expert, for cost of transportation and $5 per day. Contracts for large water supplies will be entered into by us upon the most favorable terms—*upon the basis of success or no pay.*

Material for wells not more than 40 ft. in depth, including pump and license, will be sent for $45. Wells of 50 ft. will be supplied for $50, and for each foot over 50 ft., at 40 cts. per foot—to be sent, *in all cases*, before the goods are shipped.

In sending your order, it will be of advantage also to send us as full and accurate a description of the proposed location of the well, the distance—or supposed distance—of the water beneath the surface, the nature of the soil from the surface down—so far as known, the thickness of the different strata, and any other facts likely to be of advantage to you and us in writing our letter of instructions. In any case where, from the statement of facts, we are satisfied water cannot be obtained in satisfactory supply, we shall so state, and will immediately return your money.

We refer, by permission, to: Chas. Miller, Esq., of Huntington, Hopkins & Co., junction of Bush and Market streets; Lambert & Green, manufacturers of H. & L. axle grease, 144 Natoma street; M. P. Holmes, carriage manufactory, 327 and 329 Sutter street; Judge Robert Thompson, 76 Montgomery Block; R. H. McDonald, President of the Pacific Bank. All of San Francisco.

For circulars and other information, address BABCOCK, HOWARD & Co., 40 Merchants' Exchange, S. F., Cal.

NOTE.—No letter of instructions will be sent, except it is sent with the goods.

News in Brief.

THE Land League is being reorganized under the name of the Political Prisoners' Aid Society.

THE present winter promises to be a very active one as regards mining operations in southern Oregon.

THIRTY thousand tons of wheat have already been exported from Los Angeles county the present year.

E. H. SHOEMAKER has been appointed Assistant Superintendent of the North Pacific Coast railroad.

IT appears that $13,323,000 has already been expended on the Brooklyn bridge, and $3,000,000 more is necessary.

DURING the month of Nov., the receipts of the Harbor Commissioners' office from the wharves, were $45,396.31.

THE hooks, machinery, statuary and other movable property of the University, valued at $300,000, are being inventoried.

SIR JAMES PAGET, the eminent London surgeon, has been suffering from blood poisoning, which is attributed to vaccination.

SENATOR SAUNDERS recently introduced a bill to extend the northern boundary of Nebraska, to take in 600,000 acres of Montana.

A GOLD brick weighing $23,000 was received at Oroville last week, from the Spring Valley hydraulic company, the result of a partial cleanup.

FIFTEEN THOUSAND young salmon were turned loose in the Alameda and Laguna creeks, a few days ago, by direction of the U. S. Fish Commission.

DURING the rain of Sunday night a large fragment of the sandstone coping about two ft. in diameter, fell from the Mint building to the sidewalk.

Mining and Scientific Press.

THE MINING AND SCIENTIFIC PRESS is the leading mining journal in America, and enjoys a larger circulation among the more intelligent operators and workers in the gold fields of the world.

Established in 1860, it has firmly maintained its position as a reliable, progressive journal. The information given in its columns has saved millions of dollars to the practical miners, metallurgists, mill men, mine and shareholders on the Western side of our continent.

Among its contributors are the ablest and most experienced mining engineers, superintendents and practical miners in this country.

The PRESS gives a condensed summary of Mining News from the most important mining districts of the country.

New processes and methods of mining are described in its weekly issues. New mining machinery and improvements are frequently illustrated and explained in a manner to be of great value to all interested in mining.

As a scientific and mechanical representative of the Pacific coast it is decidedly popular, and as a standard journal with the most thrifty industrial people of the Pacific States and Territories. Its authority is of the highest order, and its usefulness in its special sphere unrivalled.

Every public library, mining engineer, metallurgist, mining operator and intelligent mechanic and manufacturer, will find profit by its reading.

Subscription, $4 a year in advance. Sample copies, postpaid, 10 cents.

DEWEY & CO., Publishers.
No. 252 Market St., San Francisco, Cal.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

Cylinder Printing Press for Sale.

A large cylinder Hoe printing press, for country newspaper work, can be bought cheap by addressing
Press, Box 2361, S. F.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—San Mateo and Santa Clara counties.
C. E. WETMORE—Alameda county.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francisco.

COPP'S "U. S. MINERAL LANDS, LAWS, FORMS, INSTRUCTIONS AND DECISIONS."—1881. 570 pp. In full law binding, $4.50; half law binding, $3, at this office.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F.D., at this office.

Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

SAN FRANCISCO, DECEMBER 2, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 35, of Seventy-five Cents (75 cents) per share was declared payable on Monday, December 12, 1881, at the office in this city, or at the Farmers' Loan and Trust Company in New York. WM. WILLIS, Sec'y.

Office—Room No. 29, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

SAN FRANCISCO, CAL., DECEMBER 2, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 36, of Seventy-five Cents (75 cents) per share was declared, payable on Monday, December 12, 1881, at the office in this city, or at The Farmers' Loan and Trust Company in New York. WM. WILLIS, Sec'y.

Office—Room No. 29, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

SAN FRANCISCO, DECEMBER 2, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, Dividend No. 1, of Ten Cents (10c) per share was declared, payable on MONDAY, December 12, 1881. Transfer books closed on Monday, December, 5, 1881, at 3 o'clock, P. M. This dividend is payable at the Farmers' Loan and Trust Co., in New York or stock issued there, and at the office in this city on stock issued here. WM. WILLIS, Sec'y.

Office—Room 29, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company.

SAN FRANCISCO, DECEMBER 6, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, a Dividend (No. 24) of Twenty-five Cents (25c) per share was declared, payable on THURSDAY, Dec. 15th, 1881, at the office of the Company, room 19, 328 Montgomery street, San Francisco, California. Transfer books will be closed on December 10, 1881, at 3 P. M. JOSEPH NASH, Sec'y.

ANNUAL MEETING.

THE REGULAR ANNUAL MEETING OF THE

Gould & Curry Silver Mining Company,

Will be held at the office of the Company, Room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California, on MONDAY, the nineteenth day of December, 1881, at the hour of one o'clock, P. M., for the purpose of electing a Board of Trustees to serve during the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Thursday, December 15, 1881, at the hour of 3 P. M. ALFRED K. DURBROW, Sec'y.

Business Directory.

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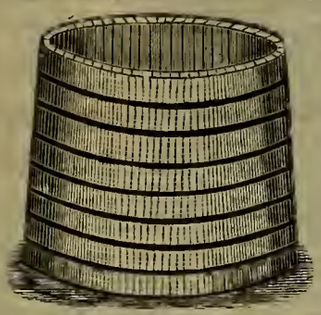

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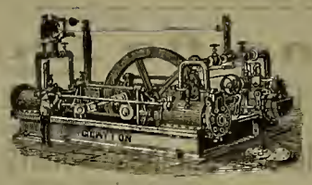

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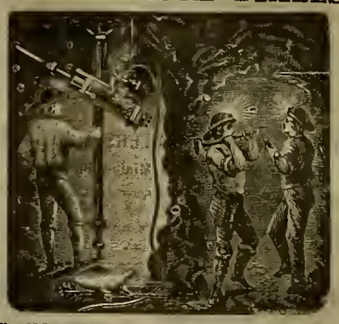

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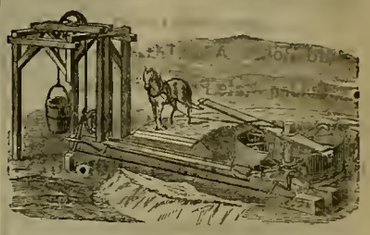

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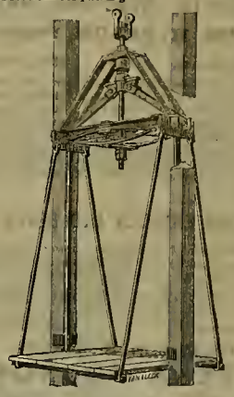
One Horse can easily hoist over 1,000 pounds at a depth of 500 feet. The Power is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing



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SAVE YOUR GOLD!
—BY USING—
SILVER PLATED AMALGAMATING PLATES.
The most economical and successful process now in use. Will warrant my Plates to save a very much larger percentage of gold than any other method.
SWING AND RIFFLE PLATES for Saving Float Gold Made to Order.
OLD MINING PLATES BOUGHT, TAKEN IN EXCHANGE FOR NEW, OR RE-PLATED.
ALL KINDS OF METAL GOODS PLATED!
San Francisco Gold, Silver and Nickel Plating Works,
653 and 655 Mission St., bet. New Montgomery and Third, San Francisco.
Send for Circular. EDWARD G. DENNISTON, PROPRIETOR.
Awarded First Premium at Every Fair of the Mechanics' Institute for the Last Twelve Years.

THE RISDON IRON AND Locomotive Works
Corner Beale and Howard Sts.,
SAN FRANCISCO, CAL.
W. H. TAYLOR, Pres't. JOSEPH MOORE, Sup't
Builders of Steam Machinery
IN ALL ITS BRANCHES,
Steamboat, Steamship, Land
Engines and Boilers,
HIGH PRESSURE OR COMPOUND.
STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.
ORDINARY ENGINES compounded when advisable.
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HYDRAULIC RIVETING. Boiler Work and Water Pipe made by this establishment, riveted by Hydraulic Riveting Machinery, that quality of work being far superior to hand work.
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Challenges the World
To produce as good and cheap a Machine. Rock Breaker and Cornish Rolls combined in one Machine. Pulverizers, to Granulate Ores, for Roasting, Chloridizing, Leaching and Concentrating.

Concentrating Machinery!
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Gold, Silver, Lead and Copper Ores.
Furnaces for Roasting and Chloridizing Ores, for Amalgamation or Leaching.
Plans, Drawings and Estimates for Working Ores by any process
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J. W. QUICK, MANUFACTURER,
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The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.
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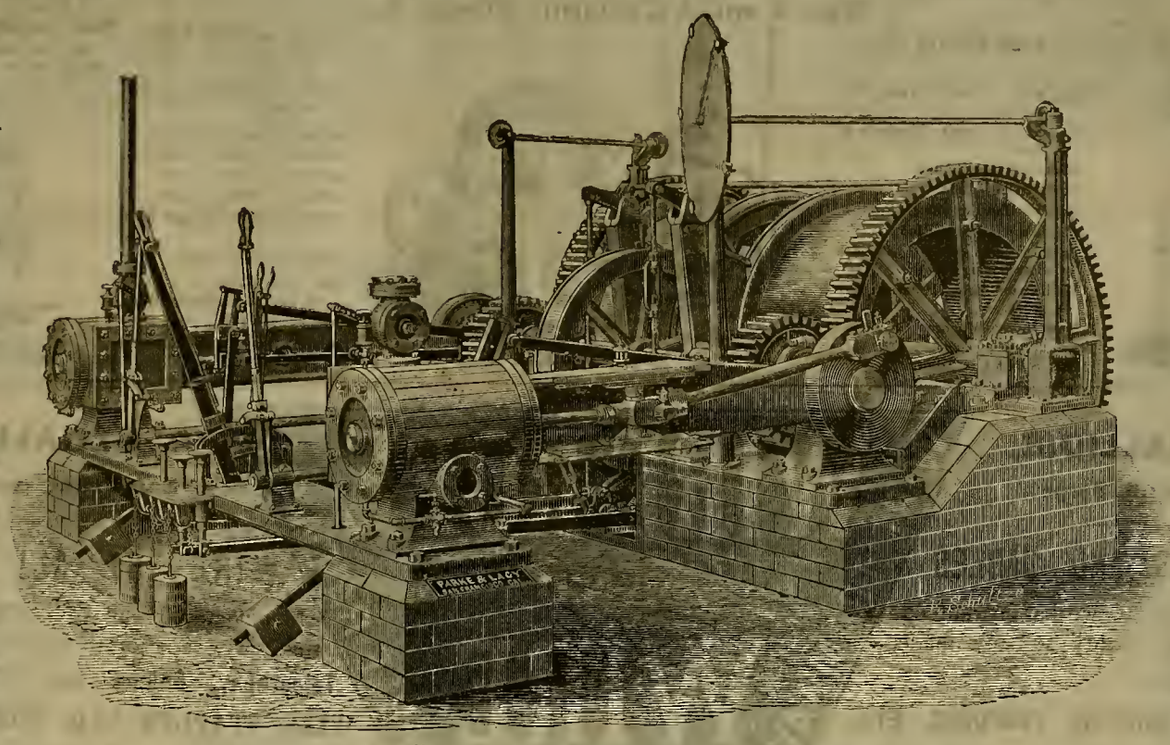

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WOOD WORKING MACHINERY, MANUFACTURED BY THE H. B. SMITH MACHINE COMPANY,

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Plunger Jigs. Revolving Screens.
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ENGINES, BOILERS, STAMP MILLS, FRUE VANNERS
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HOWARD'S PATENT Rotary Crushing Cylinders.
REVOLVING CYLINDERS AND ORE DRYERS.
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VULCAN BLASTING POWDER.

—THE MOST ECONOMICAL AND BEST—

Nitro-Glycerine Explosive in the Market.

In the suit of the Giant Powder Co. against the Vulcan Powder Co. for *alleged* infringement of Patent, it was held that the Giant Powder Patent was INVALID.

Nos. 1, 2 and 3 Vulcan,

Each grade superior to like numbers of any other Nitro-Glycerine Powder in the market.

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Superior to Black, Judson or any low grade Powder for Bank Blasts, Railroad work, or any work where Black Powder has been heretofore employed.

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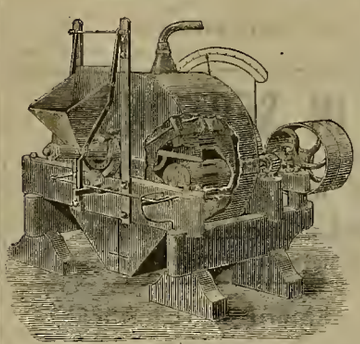

WORKS ORE WET OR DRY,

And Feeds Itself Automatically.

Patented October 11, 1881.

One of these machines can be seen at the Ore Sampling and Pulverizing works of Hofmann Bros., No 415 Mission St., where it is working every day. Weight 5,000 lbs., heaviest piece 480 lbs.

Manufactured at the

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308 Mission Street, S. F., Cal.,

By W. I. TUSTIN, Inventor and Patentee.

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VIEW OPEN. PATENTED, MARCH 1, 1881. VIEW CLOSED.

1st. Cheapest. 2nd. No Wire Necessary. 3rd. Can be Attached or Detached with Ease. The whole requiring less than one minute, and so simple that it may be done by a child. 4th. Does not Leak. It is absolutely water tight. 5th. Neatness. In separating it from the faucet, it can be done without filling the sleeve with water, or drowning the body. It is withal ornamental. Examine It! Give It a Trial! I Guarantee Satisfaction! All Sizes Supplied. Address D. B. KENDALL, PATENTEE. American Exchange Hotel, San Francisco.

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Manufacturers and Importers of all Kinds of

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Of Standard Reputation. The largest and finest assortment in the city. Musical Boxes with changeable cylinders always on hand at low figures. The latest style patented, "THE INTERCHANGEABLE," patented February 11, 1879.

Repairing Musical Boxes and Furnishing Material a Specialty.

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The Korting's Injector is the simplest, cheapest and best in use. Will draft its own water, hot or cold, and feed under varying pressure. Send for Circular.

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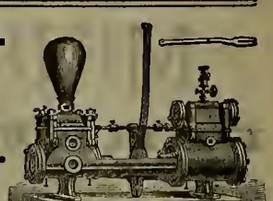

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More Than 16,000 in Use.

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Hoisting Engines of all Kinds.

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New York Belting & Packing Co.'s Rubber Belting, Hose, Packing, etc.
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WIRE ROPES AND CABLES,

Manufactured at my works, guaranteed to be equal in quality to any made, and as cheap, for

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Wire Suspension Bridges and Aqueducts.

WIRE ROPE

WIRE TRAMWAYS — FLAT AND ROUND — CABLE RAILWAYS

WIRE

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WIRE OF ALL KINDS,

Manufactured at my Wire Mills in this city, superior to any imported, for

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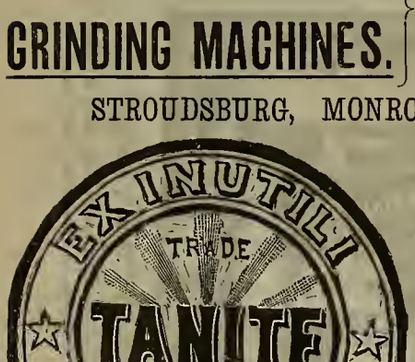
WIRE STAPLES AND WIRE NAILS.

Wholesale and for Export.

EMERY WHEELS and GRINDING MACHINES.

The Tanite Company.

STROUDSBURG, MONROE COUNTY, PA.



Orders may be addressed to us at any of the following places at each of which we carry a stock.

SAN FRANCISCO, CAL.
Nos. 2 and 4 California Street.

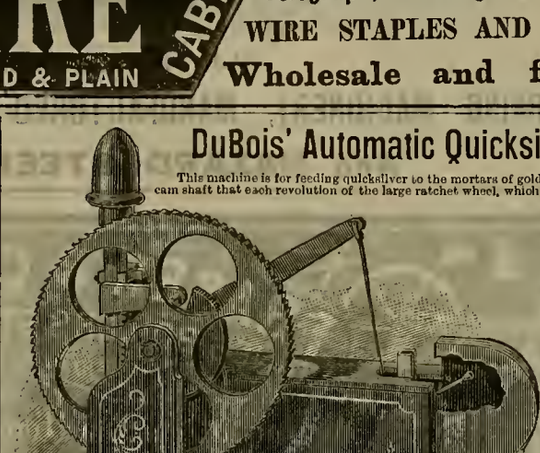
PORTLAND, OREGON,
No. 43 Front Street.

CHICAGO, ILLINOIS.
Nos. 152 and 154 Lake Street.
And 40 Franklin Street.

ST. LOUIS, MISSOURI,
No. 209 North Third Street.

ST. LOUIS, MISSOURI,
Nos. 811 to 819 North Second Street.

DuBois' Automatic Quicksilver Feeder.



This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.

A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.

Price, complete, $100.

For Sale by **WHITNEY & MARSHALL,** Sole Agents

22 & 24 Fremont St., San Francisco.

Dealers in Iron, Steel, Hardware and Mining Supplies, Wrought Iron Pipe and Fittings, Pump Columns, Wire Rope, etc. A large stock of Boiler, Plate and Sheet Iron of every description.

ENGINE LATHES IN SECTIONS.

Limit of weight for 25-inch Lathes, 300 pounds. For 17-inch Lathes, 150 pounds.

READY WITHIN 10 DAYS,

Standard and Special Machine Tools.

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AMERICAN EXCHANGE HOTEL.

Sansome Street, (Opposite Wells, Fargo & Co's Express), San Francisco.

This Hotel, under the management of CHAS. MONTGOMERY, has been thoroughly renovated, and being in the very center of all the Banks, Insurance Offices and Commission Merchants, it offers special inducements to Merchants from the Interior and Farmers.

Board, with Room, $1, $1.25 and $1 50 per day. Special rates by the week or month.

FREE COACH TO AND FROM THE HOTEL.

WIND MILL. One of the best made in this State for sale cheap on easy terms. Address, W. T., care of Dewey & Co., S. F.

KNIGHT WATER WHEEL.

All sizes of this Superior Wheel furnished at the shortest notice. Send for circulars to

ALMARIN B. PAUL, Agent.

Room 20, Safe Deposit Building, San Francisco, Cal.

PACIFIC POWER CO.

Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

WANTED!

Several Good Dividend Paying

Mining Properties,

FOR THE

New York and London Markets.

None but First-class Mines wanted.

Apply to

HALE & CO., 317 Montgomery St., S. F.

42 years' practical experience; 14 on Pacific Coast.

ASSAYING — No. 1 WALL ST. N.Y. — TAUGHT

J. J. Phillips E.M.

EXAMINER OF MINES AND ASSAYER

CONSULTING ENGINEER & METALLURGIST

AUTHOR OF

The Explorers', Miners' and Metallurgists' Companion, 672 pages, 83 Illustrations (2d edition). Price . . . $10 00
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Various Prospectors' and Assayers' Tools.

SEND FOR LIST OF PRICES.

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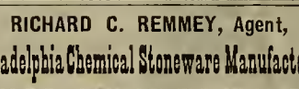
Philadelphia Chemical Stoneware Manufactory.

1100 E Cumberland St., Philadelphia, Pa.

Manufacturer of all kinds of Chemical Stone Ware for Manufacturing Chemists. Also, Chemical Bricks for Glove Towers.

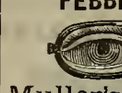
PEBBLE SPECTACLES.



Muller's Optical Depot,

135 Montgomery St., near Bush.

SPECIALTY FOR 30 YEARS.



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The most complicated cases of defective vision thoroughly diagnosed, free of charge. Compound Astigmatic Lenses Mounted to order in *Two Hours* notice.

Orders by mail promptly attended to.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

THIRTY-TWO PAGE EDITION.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, DECEMBER 17, 1881. VOLUME XLIII Number 25

A New Grinding and Amalgamating Pan.

Isaac Lepley and Wm. H. Hepburn, of Amedor, Amador county, have just received a patent through the MINING AND SCIENTIFIC PRESS Patent Agency for an improvement in amalgamating pans, which consists of an appuratus for imparting a peculiar motion to the muller by causing the upper end of the shaft to describe a small circle in addition to the rotation upon its axis, so that the muller will be revolved, and will also be caused to have a rolling motion upon the dies.

An ordinary pan with the usual dies, is used, and the muller with its shoes is driven by the ordinary vertical shaft, having a common band wheel and screen to raise and lower it. A bevel gear and pinion upon the horizontal driving shaft, under the pan in the usual way, give motion to it.

The horizontal bevel gear is secured to a short supplemental spindle which turns on a step, and has a peculiarly slotted opening in its upper end to receive the foot of the vertical shaft, which is corrugated or grooved to fit this slot, and forms a universal-clutch joint, so that while it will be rotated by the action of the gears upon the step, the upper end of the shaft may also be allowed a rolling movement, like that in a ball and socket joint.

In order to produce this movement of the upper part of the shaft, a case is formed in the upper part of the central line of the pan, and rollers are placed vertically within this case, so as to inclose the shaft between them. The ends of these rollers have pintles, which are journaled in guiding plates, and the rollers just fill the space between the sides of the case and the vertical shaft, so that as the latter rotates, they roll around between it and the case.

Two of these rollers are higher than the others, and they thus turn the vertical shaft out of a central line, and as it rotates, it will thus be caused to describe a circle with its upper end.

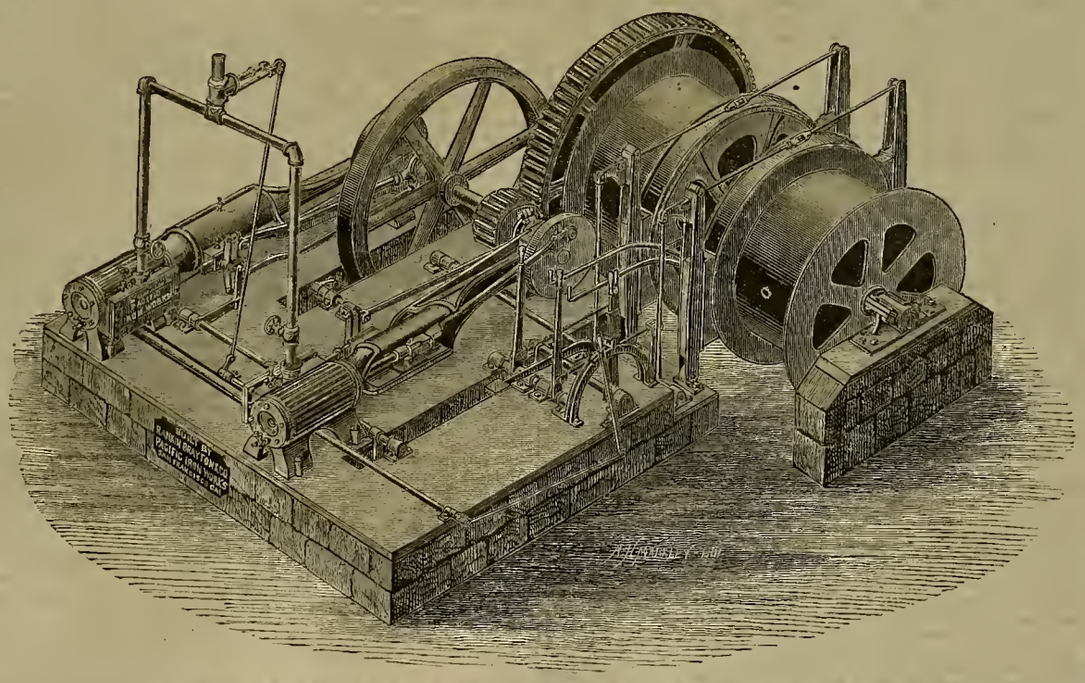
As the muller is carried by the upper end of this vertical shaft, it will also partake of this motion, and the result will be that the shoes upon one side will touch the dies or rims close to them, while those upon the other side will be lifted away from the dies. The outer edge of the muller will thus be given a rolling motion around upon the dies, so that the shoes are brought alternately into contact with the dies, while the muller is all the time revolving upon its own axis.

This peculiar motion tends to bring the pulp beneath every part of the muller, and to subject it to a thorough action. The same motion may be imparted to the muller in various other ways, as by the use of an eccentric sleeve instead of the rollers, or by other means, the object being to prevent the muller and dies wearing to a perfect fit, as occurs when the muller has only a plain horizontal motion.

THE hydraulic and placer miners of Siskiyou have begun operations by reason of the storm furnishing a supply of water. The quartz mills run by water power will also be started up in crushing quartz on hand.

Double Engine and Double Drum Geared Hoist.

The cut shown on this page is an improved style of mining hoist made by Rankin, Brayton & Co., of the Pacific Iron Works, in this city. It is intended for a double compartment shaft, and has a pair of link engines attached to one crank shaft. The drums are loose on the shaft and connected to same by clutches which slide on steel feathers. The spur gear is keyed to the drum shaft, which rests on supports fonndations. Each drum has a post brake, which is operated independently, by which means the



DOUBLE ENGINE AND DRUM GEARED HOIST FOR DOUBLE COMPARTMENT SHAFTS.

drums can be used together or separately, or one can be hoisting while the other is lowering, and both lowered without the use of the engines. A friction brake is also attached to the flywheel, giving ample brake power in any emergency.

Levers for brakes, reversing gear and throttle, it will be observed, are all under the control of the engineer at one point. Indicators are attached to each drum, and drums made for flat rope when desired. The gearing, levers, brakes and other parts subjected to strain are made extra heavy, and the material and construction are first-class in every respect.

This is one of the safest, most convenient and approved style of hoist now made, and has given great satisfaction wherever used. Made of two sizes—10x20 inch and 12x20 inch cylinders, and adapted to either vertical or incline shafts. The former will work to a depth of 1,000 ft., carrying the usual load, and the latter to a depth of 1,200 ft.

CANDELARIA.—A good many Cometockers, says the *Enterprise*, are making arrangements to go out to Candelaria as soon as the Carson & Colorado railroad reaches that point. With an adequate supply of water and swift and sure communication with the leading towns of the Pacific coast, Candelaria will become a lively place. Several of our people, who hold valuable interests in that region, are only awaiting the completion of the railroad to go out and commence operations on their claims.

The Mining and Scientific Press.

As we are nearing the close of the year, it is well to remind our regular readers that it is a good time to renew subscriptions, and it is also proper to call the attention of those who may be casual readers, to the fact that they also ought to help support a legitimate mining journal like the PRESS.

We have been publishing this journal for a great many years, and may be presumed to be pretty well posted in mining affairs, especially as they relate to this coast. We have been enabled by this knowledge and experience to save our readers many thousands of dollars in years past and will no doubt continue to do so.

The PRESS illustrates and describes all new processes, new mining inventions, machinery, etc., and keeps its readers thoroughly posted in all that is going on. We do not always wait for new things to be tried, but believe that miners and metallurgists are interested in experimental work and its results as well as in perfected appliances or processes. We have reason to know that this practice of the PRESS is appreciated by its readers.

As to the mining news of the day, we give it in a condensed form, readable yet concentrated, and free from all verbiage. Our mining summary is carefully compiled and edited each week and compresses in brief space the current news from a very broad area.

In a word, the MINING AND SCIENTIFIC PRESS is the best mining journal on this coast. It always gives full and complete information on all new things in its line, and will be found to be generally right in its conceptions of the merits of the various mining and metallurgical inventions that come to the front. Since the mining areas have widened, the mining papers have increased; but there are many which are only such in name, with no knowledge of mining matters outside of those which occur in the stock markets of the various cities.

The PRESS will continue to improve, and we hope to have received aid of our old readers and of new ones. As we said before, "this is a good time to subscribe."

The Hamilton Process.

Some few months since there was announced with great flourish, the invention of a new process for working ores, which was to "revolutionize the systems" in vogue. The inventor was Mr. Hamilton, and his invention was called the Hamilton process. It was to work ores in a peculiar manner, the use of a bath of melted lead being the principal feature, this melted lead being intended to do away with the use of quicksilver. The process was examined and said to have been endorsed by many so-called mining experts in New York—none of whom were ever heard of out here in the mining districts. It *was* thoroughly endorsed by several so-called mining newspapers in the East; papers so situated that their editors could have examined the process critically, had they been so inclined.

At the time the lengthy descriptions of the process were appearing in the various journals, the MINING AND SCIENTIFIC PRESS predicted its failure to accomplish the objects desired for the price named. It gave a history of lead bath processes, and the reasons for these not being generally used.

It has now transpired that the Hamilton process has turned out a failure. It is not only found that the process could not work ores for $1 per ton as was claimed, but that it cannot work them advantageously at all. It was as predicted; the experimental results were not borne out by trials on a large scale. The extensive works to be erected in New York will hardly be built.

Thus another is added to the long list of "process failures," which has brought the name of the "process men" into disrepute. This like many other processes has been tried on this coast, and now that the field is no longer a pleasant one, new regions are sought. In New York, where they think they know all about mining, a process will take better than here. We have tried most of these things here and the Eastern people are just taking primer lessons on subjects in which we have graduated. They have yet to go through the same experience that we did, and this is only one of the lessons to be learned.

GROUND lying to the westward of the Comstock is beginning to be looked after to some extent. This is probably because it is thought that the Sutro tunnel will make an advance in that direction as soon as it has completed connection with the Forman shaft. In the early days a good deal of prospecting was done to the westward of the Comstock croppings, but when bonanzas began to be found to the eastward all work to the westward was dropped.

THOS. HULLY, who has a water mill on Six-mile canyon, has bought the Lady Bryan waste dump, estimated to contain 50,000 tons of rock. This rock was dumped out in early times, and it is now thought that the greater part of it will pay for working. Mr. Hully has also leased the Rogers mine, Flowery, and will proceed to extract ore from the same for reduct at his mil

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

From San Francisco to Tombstone.

Cities and Towns along the Way—Yuma, Silver District, Volcanoes, Petrified Forests, Etc., Etc.

EDITORS PRESS:—On the morning of Nov. 17th we boarded the train of the Southern Pacific Railroad, for a trip through the southern part of the State and Arizona, specially in the intsrest of the MINING AND SCIENTIFIC PRESS.

Leaving the long wharf at Oakland, and ths "Metropolis across the Bay," hehind, we sped over the smooth rails in the magnificent cars of the S. P. R. R. Co. As ws ride along the bay shore we see the city on the left, Alcatraz and Goat Island in ths foregronnd, beyond which we catch glimpses of the great Pacific through the Goldsn Gate.

Aronnd the point to Port Costa with its huge transportation steamer—the largest in the world—Martinez is passed, Antioch reached, and we enter the valley of the great San Joaquin, up which the Southern Pacific follows to its head, throngh thriving towns and villages, the almost houndless valley stretching away on either hand.

On the right of Martinez, Mount Diablo holds its head; a mass of hill and mountain peak rose somher and grand, tearing the fleecy fog-clouds to shreds, and girding itself in vapory fsstoons.

A single patch of snow flecked the monntain summit on the north side, while roses bloomed in ths door-yards along ths way. Lathrop is reached, and the sound'ng gong summons ns to dinner at the Railroad Hotsl.

Resnming our seats, np the grand valley—the Egypt of California—we speed. The serrated, snow-capped peaks of the Sierra Nevada break on ths view. This line of mountain chain we are destined to follow to whers it sinks—in the San Bernardino chain—to a lsvel with the sea, on the confines of the great Colorado desert.

On the left the Diablo chain of the Coast Range rolls away toward ths south, the wids valley of the San Joaqnin hetween.

Plowing and seeding are the order of the day. Great piles of grain greet us at evsry station—indisputable evidence of the wealth and fertility of the vallsy.

Modesto—the bsautiful—is passed. Here ws sse ths evidences of the late conflagration in blackened walls and tottering chimneys. Here we cross the sparkling Merced, with its fringe of shady oaks and fruitful farms lining either bank. We pass Merced, with its grand hotel, and fine court and business houses, as the warm sun sinks hehind the westsrn range of mountains, and night casts its mantle of shadow over the plain.

As we approached the supper station ws wers startled to hear the brakeman call out, at the top of his voice, our name. We are pleased to leafn there is a town in the State—to which we emigrated in our hoyhood—of the writer's family name, even if they do spell it incorrectly.

Daylight found us rolling down the Solsdad canyon, (we were disappointed in not bsing able to visw that sxtraordinary piecs of sngi-nesring—the Loop in daylight) to the town of Newhall, situated in the San Fernando valley. The fields are beginning to assume their rohes of green under ths influenco of the recent rains.

At Los Angeles we breakfasu. Flowers are blooming in the gardens and door yards; their odor hangs heavy on the morning air. Promising ourssif to stop over at this point on our return, we roll ont of the city, hetween rows of tall eucalyptus trees, through groves of orangs and citron trees, past beautiful country residences. Golden fruits still hang hy ths wayside, and shadowy foliage obstruct the view. Clumps of forest trees and masses of cactus hegin to appear on either hand, with now and then a tall stem of the csntury plant. The conntry

Between Los Angeles and Colton,

Through which the railroad passes, is one of the most interesting in the State. Fine farms line the way; groves of orange, peach, citron and other fruits, topped hy tall encalyptus trees, in the midst of which the rose-embowered home pesps out.

The San Bernardino mountains ars on the right, the peaks high-lighted with touches of snow. Farm honsss dot the mountain hase, rssting on patches of verdure, and mark the spot where certainly dwells contentment. Colton rests in the vernal vale of San Bernardino, the mountains which hack it rising shruptly to a great hight, up which a road leads like a thread of light in ths distance.

Shortly after leaving Colton, the scene changes—we are approaching a different conntry from that just passed through, the farms and orchards of California ars heing left hehind, and ths

Desert of the Colorado

Anticipated in the change.

At Banning we commence the descent into the sea of sands. Down, down ws go until, near Dos Palmas, ws have sunk 263 ft. hslow the level of ths sea. A run of 160 miles over the great transcontinental railroad, which ths indomitahls enterprise of men of our own Stats has thrown over this ocean of sand, brings us to Ynma on the banks of the Colorado. Palm trees, of the fan variety, ars fonnd along the monntain hase on ths desert. Sand storms sweep the barren waste at timss, and hillows of sand hreak on the railroad harriers.

At Yuma we stop over, for ths purpose of visiting the Silver district, 50 miles up the Colorado on the Arizona side.

Fort Yuma,

On the California side, is situated on the top of a small granite hill, from which point a fine visw of the snrrounding country is ohtained. The river with its lins of willow, cottonwood and mesquite trees, and the distant rugged mountain chains, purple and desolate, make a cnrious picture. A fine hridgs [shown in our engraving, of this issne, EDS. PRESS.] spans the turhid waters. At the Arizona end stands the pavilion-huilt Railroad hotel where well cooked and well served meals are furnished the passsngers hy mine host, Weaver. Wide, douhle verandas sweep around the spacions huilding. Steam pumps furnish the hotel and cars with water from the river. The Territorial prison stands on the hlnff above ths town. Most of ths huildingsof Ynma, are adohes, with flat dirt roofs. The railroad huildings are suhstantial frame structures. Here commences the first division of the Arizona S. P. R. R. The town is situated nsar the junction of the Gila, in ths plain surrounded by sand hills. The climats in snmmer is warm, but at present is all that conld be desired. Althongh the 20th of November, we saw in a garden, near the S. P. ronnd house and shops, fig trees loaded with green and ripe figs. In ths same enclosure were a numher of hanana trees, thrifty and strong, which will bear fruit next year. This is an indication of what may be done in the futnre when the rich bottom lands of the river are hrought nnder cultivation.

Half naked Yuma Indians, stroll up and down ths streets, or go hy loaded with squashes and corn, from their farms across the rivsr. Stsamers lie along ths stream, and trains pass every few hours. Ynma is ths county seat of Ynma conuty.

The monntain range to ths north and east ars capped with domes and spires of rock, worn into fantastic shapes, hy the eroding elements. Groves of mesqnite, with ths long pod and peculiar screw hean, ahonnd along the river hottoms, which are held sacred hy the Yumas, who gather the heans for food, and cultivate a few fertile acres along the river. Flights of ducks go swiftly hy, and myriads of hlackhirds sing in the mesqnite trees. A hlue heron stands on a projecting sand har, gazing silently into the turhid waters.

Yuma is well worth a visit, and as a sanitarium, the mild, dry climate of its winter months make it a desirahle locality.

Silver District.

Next morning we took stage for the town of Silent. Our routs lay up the hank of ths Colorado. We crossed the Gila—quits a hroad stream at this point—a few miles above the town. At the ford, came suddenly upon some naked Yuma Indians—men and women, wading the river, laden with mslons and squashes. Dense groves of mesquite and willow linsd the road, the underhrush composed of arrow wood, from which the Indians make ths arrow shafts. Occasionally we passed scaffolds raised a few feet above ths ground and covered with hrush, places where the Indians deposit thsir store of mesquite heans. Thsss beans ars fed also to horses and other stock, the stage-driver informing us that his horses were partially fed on them. Canes grow along ths river hanks close to the water's edge.

Fifteen miles above Yuma, on the left of the road, we pass an extinct volcano called Boot Monntain, from its appearance to an npturned boot; the hlack hasaltic lava from this has run down across our road toward the river. This peak is the commencement of a snccession of volcanic peaks and hills which honnd the river on hoth sides. The hills are harren. The Palo Verde, Palo Ferrea, cat-claw mesqnite, Ocatilla and greasewood now appear in the dry beds of hroad arroyos.

The Giant cactus (*Ceres Gigantia*) or the Sagura, as it is called, now appears on ths harren hillsides, some of them standing 30 or 40 ft. high, like collosal sentinels guarding the desolate hills.

This ever curious and interesting variety of the genus *cactus* is met with all along the road. They appear to he hnilt on a hundle of small round sticks which extend from the hass to near the top. They are fluted hstween the sticks, and armed with terrihle thorns. The woodpeckers huild their nests nsar the top, consequently they are full of holes, from which the red headed builders look out.

Among the many wonders to hs found in this wonderful country—in this locality—are

The Petrified Trees,

Standing in an upright position, many of them with hranches still sxtending from the stone trunk. They are Palo Verde and Palo Ferrea trees. The solution of the prohlsm in regard to their petrifaction in this position, is, they have been covered with volcanic ashes during the volcanic epoch, and then silicified, after which event the ashes have been removed hy the eroding waters, and ths trees left standing. They look from a distancs liks the dried trunks of trees, and have been taken for such hy the prospectors in search of wood.

It is related of the discoverer that camping late near what he thought was a dry tree, hs was astonished to find in hreaking off a limb the tree was of solid stone.

At Castle Dome,

We dine. A steamhoat from Ynma is at ths landing, loading with galena ore from the Castle Doms mine 12 miles away. Ths ore is taken to Melrose, Alameda conuty, California, and used as a flnxing for other ores hy the Melrose smelting works; the company's stors and othsr buildings are locatsd at this place.

Castle Dome, a cupola capped mountain, looking much like a hugs hnilding, lies hsyond the mine from which it takes its name. Lines of monnment capped or serrated peaks and hroken hills lead off on eithsr side; towers, minarets and fantastic forms of rock, worn and woven into every conceivable shape, stand out with wonderful clearness against the hackground of azure.

There is a remarkahle clearness in the atmosphers of this region; ths distant monntain ranges nnohscnred hy haze or smoke, the vision seems to extend to an unlimited distance.

Dry arroyos, down which the monntain torrent rushes in the rainy season, lead up the volcanic slopes Ths rocks are gray and hlack hasalt, trachyte, tufa and volcanic ashes cemented hy water, porphyry, hut little or no sedimentary rock.

At night we reach ths littls town, or

Camp of Silent,

Abont fifty miles from Yuma. The town is located in what appears to hs a extinct crater ahout one mile hy one-half mils in diameter. The hills are harren, covered with a volcanic formation, the underlying rock heing syentic granite. The lodes are what are known as contact veins, and ars found cropping in most instances against ths walls or hills of granits, the foot wall hsing of that rock and the overlying or hanging wall of eruptive porphyry, trachyte or a calcareous tufa. The lodes all conform to the pitch of ths underlying granite, and at some points are quits horizontal. They appear to have been formed along the hottoms and up ths sides of the hasins, as thongh held in solution and gradually ccoled, leaving the slag collected in ths form of conglomerate croppings.

On the northwest slope of the volcanic crater or hasin is located the

Red Cloud Mine,

Which is an immense deposit of argentiferous galena and carhonats ores. Some chlorides and horn silver ars fonnd. The gangue is mostly calcite, fluor spar, with silicate of lime. Sulphide and sulphats of lead ars also met with. Beautiful specimsns of molyhdate of lead and vanadinite are ahundant.

The smaller veins of ths lead-hearing silvsr ore penetrats the spar gangue, following the forms of their crystals in zigzag courses.

The Black Rock has a large hody of ore of the same natnre and quality as the Red Cloud, and is located in the sams hasin, a mile or more from the Red Cloud.

Work is heing prosecuted on the Black Rock, hnt the mine and works of the Red Cloud are idle, and her smelter stands silent on the hanks of the river five miles away. Assessment work is heing dons on many of the other mines and prospects in the district, hut no ore is hsing rednced at present. Ths Black Rock contemplates smelting works ere long. If the ores of this district can he worked hy a system of concentration, they will prove to hs immensely valuable.

An arroyo cnts the west rim of ths hasin, and leads down to the river. A railroad, to carry ore to ths same, has heen snrveyed up the canyon, which has an easy grade.

Silent is correctly named. Its harren, silent, purple, verdnreless, rock-hound hills, echo no sonnd, except the hlast of the miners, and her volcanic slopes snpport nothing green, hnt from the top rim of the hasin we view the Rio Colorado, a hright line in ths harren hills, flowing grandly to the sea. GEO. MADEIRA.

Nuggets.

EDITORS PRESS:—Reading in recent numbers of your journal abont hig nnggets, I am reminded that I had the honor to hslp dig some nnggets out of the mines near the Middls Fork of the American river, in El Dorado conuty, not far from Volcanoville, and also to see others dig them out. Ths first of which I have any rememhrance was a smooth, flat piece, weighing $900, fonnd hy Henry Shattuck, in a small, dry gulch, close to the town named. Another piecs—long, flat and smooth—weighing $1,000, was found in a dry ravine, not more than 200 ft. from the first piece, in the same ravine. This was fonnd hy two brothers named Payans—John and Lemnel.

I, with these two hrothsrs, on a small ridge, not more than 50 to 100 ft. from the same claim, helpsd to get out $6,000 or $7,000, and the most of it was in piecss worth from $200 to $300 each. All of this we had hid in the flue of our stovs for a long time. Not far from ths claim there were several othsr nnggets found, and also in the snrrounding gulches from one to two miles away; hut I am not certain how many, nor who fonnd them, as so long a time has elapsed.

I, with a man named John Wishy, found a smooth, round piece, that was worth $310, on a dry ridge, not far from Slug Gulch, (called so from the hig pieces taken out of it) on the Georgetown trail to Volcanoville, on the south side of Otter creek. This piece I shoveled up on my shovel as I was shoveling out stones, and on ths same shovel and at the same time I got two other pieces weighing from six to eight ounces. These pieces were not got in ths ravins propsr, hnt on ths ridge closs hy, in an old ravine that had been filled up. All of this gold was found on a line nortb and south, and was from a vein of gold-hearing quartz that passsd along on this line, hut in many places was decomposed and lsft this gold.

Thsre was a man hy the name of John Mab that had a nugget of $300 which I think was taksn out in the same vicinity, hut I am not absolutely sure. I also helped to taks out of the same vein not more than half a mile from the little village hefore msntioned, some pure piecss in all supposed to hs from $80,000 to $100,000, one piece, in particular, that I helped to gst ont in the ravine sticking fast to the quartz, hut at least one inch above the stons so large that I could stand on the same with hoth feet. This piece was in the vein just below a small fall in the ravine of hut two ft. Ths water, as it fsll, struck direct on this piece of gold. The mine helonged to two, or rather to three men hy the names of Job Herin, Christian Rawl, and a man hy ths name of "Balty," so called hecause he was from Baltimors, his real name I do not remember, nor do I remember how hig or how much this piece was worth, hut to the hest of my memory it was worth from $1,200 to $1,500.

San Francisco, Dec. 7, 1881. J. H. STEWART.

Rice Growing.

EDITORS PRESS:—I ses that some ons up the country has hcen trying rice growing. I tried it once myself, in Los Angeles, insids ths city limits. I got the rough rics sent me from the west coast of Africs. There is a hull on rice which it is necessary to leave on whsn used for planting. Hulling rice destroys ths germ. In that tropical climate, 4° north, I saw it raised in abundance, and on the tops of the highest hills mostly. The natives clear off the land every time thsy raise a crop. Cutting down all ths brush and trash in the dry season, the sun soon drys it so that the whols patch is liks a brnsh heap, and so is all burnt over. This is just at the heginning of the rainy season. Then, with a little hoe, liks a short chissl, they give a little tap ahout an inch into the ground, and with ths other haud drop a fsw seeds into it; and as they still reach a little farther to strike, ths dirt flies back, covering it mostly about half an inch. Then coms the rains, and the rics starts and grows rapidly, keeping down other vegetation, till in ahout four months a heavy crop is ready to harvest, witbout any further cultivation. I thought it would do so here in California, and I think still it might, tbough it failed with me jnst as up the country. I had not sufficient water to keep it growing rapidly. I planted it in drills ahont a foot apart, and got it too thick. It grew rank, however, for a time, but having heen stinted for water, it grew hut ahout two ft., and after a while turned yellow, without throwing out heads. But I have always thought I could raise rics hy having plenty of water, like the rains of Africa, and not planting till the ground and weather was quite warm and using for the purpose the fonr warmest months in ths year. This rics hill does not require flooding. And I have heen informed that Carolina rics is not flooded so much on account of the rice as to kill the weeds. Ths rice, of conrse, needs plenty of water, hut it can stand to he covered for days, and weeds cannot.

H. H. MESSENGER.

Riverside, Pinal Co., A. T.

Harshaw, Arizona.

The little town of Harshaw over in the canyon don't look as if it amonnted to much, hut when you hegin to look around and ses what is heing dons in ths immediate neighborhood, one realizes very quickly that there is a rsason for stores well filled with goods, for hotsls supplisd with good viands, to say nothing of saloons with the hest of something good to drink.

The trade with Sonora from this point is hy no meaus small, and it is daily heing angmented. Then comes the Harshaw mines, with 80 men regularly employed and getting good wages as miners, with not less than 35 hands walking ahout the mill tnrning out $100,000 every month in hnlliou. This in itself will maks a pretty good support, hut that is not all. Ths French mine, under the snperintendence of Mr. Gallagher, has had a large force of men at work, and we understand will start with renewed vigor at once. Mr. Buckminster, Superintendent of ths Pool mines, has had instructions to make a critical examination of the Alta mins, with reference to putting a force of msn at work npon it. The Rsd Rock mins is reported to he honded for $40,000. Msn are at work on this mine, and the showing is excsllent. There is a 150-ft. shaft and considerable drifting done.

The Sonora hranch of the A. T. and Santa Fe railroad will pass within 15 miles of Harshaw in its passage through the Sonoita valley, which is one of the most prodnctive regions in Arizona.—*Arizona Journal.*

THE arrivals from the mining camps continus to throng to Salt Lake, and all the hoys recognize the advantages of housing np comfortably for the winter. It is much hetter than heing snowed under in ths hills.

MECHANICAL PROGRESS.

More About Water as Fuel.

Some of our Eastern contemporaries are somewhat excited just now over a revival of the oft repeated experiments in the direction of the disintegration of water and employing the liberated gases—hydrogen and oxygen in combination with liquid hydrocarbon for making steam. The present process is claimed as something new, and is known as the "Holland Process." The company owning it claim to have successfully applied it not only to stationary and locomotive boilers, but also to open fire-places for culinary and heating purposes. It is claimed through a correspondent of the Philadelphia *Record* that

Over Fifty Experiments

Have been made with a locomotive on the Brooklyn, Coney Island and Flatbush road, and the results are as startling to the public as they have been satisfactory to the inventors. An ordinary locomotive that had been in use for many years on the road was assigned for the purpose. The Holland apparatus occupied the place of the ordinary fire-box. Three hollow pipes took the place of the furnace bars, and from each side rose burner-tips at short intervals—352 in all. A floor of iron plates studded with open thimbles, through which the burner-tips rose to within half an inch of their openings, rested on the pipes. Four heavy iron retorts rested over the first 44 burners, and they received water, naphtha and steam through separate pipes, and when heated discharged their vapors by connecting pipes into the pipes under the floor and thence into the burners. In starting the fire a small tank filled with naphtha was first lighted and placed under one of the retorts. As soon as this retort was sufficiently heated to gasify the naphtha, naphtha-gas was burned under all the retorts and water admitted into them to be converted into steam. As soon as both water and naphtha were thus gasified, their gases were jointly admitted to all the burners under the whole length of the boiler, and

The Generation of Steam

Began in earnest; and as soon as it was feasible, steam from the boiler was introduced into the retorts instead of water, so that subsequently the naphtha only had to be gasified in the retorts. At the first of these experiments, two hours after the fire was started, the gauge showed a pressure of 20 lbs., and in 17 minutes more it went up to 40 lbs. and the engine moved out. Within 20 minutes afterward, the safety-valve was blowing off at 120 lbs. At the outset, the experiments were met by

The Remarkable Fact

That just in proportion as the heat increased the consumption of naphtha diminished. It took 13 gallons of naphtha to make the first 20 lbs. of steam, but only 12 gallons to raise the pressure to 120. The practical significance of this record speaks for itself in its exhibit of ample power for running a large passenger train 40 miles an hour, at an expenditure of little more than a quart of naphtha per mile. The scientific significance is found in the fact that hydrogen superseded naphtha as fuel in direct proportion to the heat in and around the burners and retorts. At 50 lbs. pressure steam was turned upon the naphtha, and the process of disintegration began. The hydrogen released from the steam, uniting with the oxygen of the air, produced an intense heat, and the steam itself was entirely consumed. When the heat was at its height, there was no visible sign of fire in the furnace box. *All was darkness*, proving conclusively that the burners emitted nothing combustible but pure hydrogen, whose flame is non-luminous. This is the point of proof the inventors desired to reach. Their theory is that, after steam has been introduced from the boiler and disintegrated, the oxygen consumes the carbon of the naphtha. The hydrogen, being left free, unites with the oxygen of the atmosphere, and gives out from its colorless flame

The Most Intense Heat that is Known.

The question of comparative cost in running a locomotive by coal or by water fuel, is of practical, if not of scientific, importance. Dr. Holland, from whom the process is named, estimates it at 78 cents for naphtha, where the expenditure for wood and coal would be $10. The expense of running a coal locomotive varies from 10 to 20 cents a mile, according to locality, while by the Holland process the cost would not reach 2 cents a mile. The large sums of money expended by railroad companies for handling coal and cutting and storing wood will also enter into the comparison. Besides, by the use of naphtha all damages resulting from fires started by sparks will be avoided, as the water fuel emits no sparks or smoke.

A Locomotive

Has just been completed for the Holland Company by the Grant locomotive works, at Patterson, N. J., which is specially adapted in all its details to the hydrogen process. It is finished and bolsted upon jackscrews, so that the fires can be lighted and the wheels set in motion. Externally it has the appearance of the ordinary locomotive, but it differs from it in the internal arrangement of the boiler and the fire-box. All the space usually occupied by the coal fire is utilized for getting up steam promptly and increasing speed.

Experiments have been conducted for some time in the manner above indicated; but the locomotive will soon be placed upon the road for practical work with its new fuel. The correspondent of the *Record* thinks it will be a perfect success. His opinion is also confirmed by Mr. Robert White, superintendent of the Brooklyn, Coney Island and Flatbush Railroad Co., who is a practical machinist and railroad man, says: "I am satisfied, from observation and my practical knowledge of the working of engines, that the hydrogen process

Will be a Success.

I watched it carefully while they were operating with the ordinary engine, and am fully convinced that with the boiler and fire-box they are now putting in the new engine, they cannot fail to make it a success. They made their experiments here with one of our own locomotives, and they told everybody just what they were doing, and how they did it, so that there could be no possible deception about it. I witnessed it all, and I am free to say that there can be no question about the result. At a cost not exceeding 15 per cent. of coal—if as much as that—they did all that a coal engine could do, and there was no smoke, cinders, sparks or ashes, nor any smell of naphtha."

The scientific (?) explanation of the "Holland Process," as given by the parties interested, are too lengthy for our columns at the present time. They seem to represent that some new principle relating to the decomposition of water, by which a vast amount of economy in the saving of heat over other processes has been discovered. We are unable to see it, notwithstanding the claims of the practical expert. If the new locomotive does really possess the advantages in point of economy claimed for it, they will doubtless be found due to the process of developing the caloric which is occluded in the petroleum, and not to the chimerical idea of disassociating water by the heat of burning petroleum and then uniting the separated gases by the heat of their own combustion, to once more form into their original element.

An Improved Loom.

A question is now being settled by a loom maker in this country which, if even moderately successful, will bring about one of the greatest revolutions in weaving—we mean fancy weaving—that has ever been accomplished in this or any other country; and yet this is a little matter of detail—it is not a radical improvement, as one might suppose, upon finding the dobbies working on the floor, or the yarn beam elevated 10 ft. in the air—anyone would notice either one of these changes as a radical departure from general practice.

It is the little things that are being watched now with the most care, with the greatest interest, and the manufacturers of the country to-day, as a rule, are more watchful, more careful, more interested, and paying closer attention to matters which interest them than ever before. They are judging machinery more by its absolute results than because it bears the name of a certain maker, and this is perfectly correct and proper—it should be so. In no department, we believe, has greater progress been made than in weaving fancy silks, fancy and figured cottons and fine grade high sleid goods, which replace those which have previously been imported from the looms of France and Germany, and yet we believe this fancy weaving is in its infancy here; it is certainly incomplete, it is not perfect, and whenever the American manufacturer starts upon an expedition of this kind, he is sure to go fully as far as any of his neighbors.

This improvement is a credit to American skill and perseverance, and it has been found to be a serious competitor with the looms and finishing machinery of the old world. We shall have more upon this matter soon.—*Boston Journal of Commerce.*

AN ENTIRELY NEW WATER WHEEL GOVERNOR.—One of the important points with all manufacturing enterprises, and especially cotton and woolen mills, is the perfection of speed of machinery, and while this point has been eagerly sought, it has only been approximately attained. All practical men know fully, and usually by experience experience, that too many of the governors, both of our engines and water wheels, are erratic and to a great extent unreliable. In a cotton mill, with everything running at a high speed, a little irregularity in the regulator is often a very serious matter, and it is also a hindrance to that perfection in the accomplishment of quantity as well as quality of production, aside from the absolute waste of material. Upon the looms much variation of speed means waste of material, curtailed production, and more or less breakage in the working parts, which require readjustment, repair, time and expense. Among water wheel users the regulator has not attained such perfection as among steam users. A radical departure in the line of regulators or governors has recently been made by a New England mechanic, which has been tested in some of the large cotton manufacturing concerns of the country for several months, and so far it has given unqualified satisfaction. A letter press description will not convey an accurate idea and he possessed of brevity. This attachment or machine, as it may be termed, has been patented, and is owned and built by J. P. Colline & Co., Norwich, Conn. They have already a number of these regulators at work.—*Boston Journal of Commerce.*

SCIENTIFIC PROGRESS.

Astronomical Progress.

Like the sand of the sea, the stars of heaven have ever been used as effective symbols of number, and the improvements in our methods of observation have added fresh force to our original impressions. We now know that our earth is but a fraction of one out of at least 75,000,000 worlds. But this is not all. In addition to the luminous heavenly bodies, we can not doubt that there are countless others, invisible to us from their greater distance, smaller size, or feebler light; indeed, we know that there many dark bodies which now emit no light, or comparatively little. Thus, in the case of Procyon, the existence of an invisible body is proved by the movement of the visible star. Again, I may refer to the curious phenomena presented by Algol, a bright star in the head of Medusa. This star shines without change for 2 days and 13 hours; then, in three hours and a half, dwindles from a star of the second to one of the fourth magnitude; and then, in another three and a half hours, reassumes its original brilliancy. These changes seem certainly to indicate the presence of an opaque body, which intercepts at regular intervals a part of the light emitted by Algol.

Thus the floor of heaven is not only "thick inlaid with patines of bright gold," but studded also with extinct stars; once, probably, as brilliant as our own sun, but now dead and cold, as Helmholtz tells us our sun itself will be, some 17,000,000 years hence.

The connection of astronomy with the history of our planet has been a subject of speculation and research during a great part of the half-century of our existence. Sir Chas. Lyell devoted some of the opening chapters of his great work to the subject. Haughton has brought his very original powers to bear on the subject of secular changes in climate, and Croll's contributions to the same subject are of great interest. Last, but not least, I must not omit to make mention of the series of massive memoirs (I am happy to say, not yet nearly terminated) by Geo. Darwin, on tidal friction, and the influence of tidal action on the evolution of the solar system. I may, perhaps, just mention, as regards telescopes, that the largest reflector, in 1830, was Sir W. Herschel's, of four ft.; the largest at present being Lord Rosse's, of six ft.; as regards refractors, the largest then had a diameter of 11¼ inches, while your fellow-townsman, Cooke, carried the size to 25 inches, and Mr. Gruhb, of Dublin, has just successfully completed one of 27 inches for the Observatory of Vienna. It is remarkable that the two largest telescopes in the world should both be Irish.—*Sir John Lubbock, in Popular Science for December.*

CONDUCT OF PALLADIUM, RHODIUM AND PLATINUM IN A GAS FLAME.—Theodor Wilm has found that, when the double salt of palladium chloride and ammonium chloride is decomposed carefully in a small porcelain crucible over an ordinary Bunsen burner, and the residue ignited after all the ammonium chloride has escaped, the metal turns a copper color and black, while black rings and spots are formed around it, which creep up the inner walls of the crucible, covering it more and more, and if the crucible be ignited with the cover loosely laid on, there is formed between the cover and the upper edge of the crucible a cauliflower-like growth of carbon. This carbon is not burned up by further ignition, even in an open crucible. This phenomenon has nothing to do with the formation of a compound of palladium and carbon, but consists simply in a decomposition of illuminating gas by the metal and a separation of carbon, which, however, is deposited mostly on the crucible in the neighborhood of the metal, but not on the metal itself. Rhodium conducts itself quite differently. Only a trace of carbon is deposited on the crucible, but the metal itself is markedly changed, a compound with carbon being apparently formed. Platinum conducts itself unlike either of the two metals mentioned. Like palladium, it sets free the carbon of illuminating gas by simple contact, but the carbon is then deposited in the pores of the metal and does not enter into combination with it. It appears from these observations that the presence of palladium and rhodium in platinum vessels is objectionable. Platinum crucibles, into the composition of which these metals enter, soon become blistered or perforated, while vessels of pure platinum do not suffer from long continued use.

THE AZTECS.—Prof. Stapheneon, of the Hayden surveying party in New Mexico, is charged by a Chicago paper with describing the Aztecs as an extinct race that never existed. He says they are a myth, and that the tribes known as the Cliff-dwellers are to be credited with all the romance attached to the Aztec name. New Mexico is full of their buried towns and cities. During his summer's work in New Mexico Prof. Stapheneon made a number of valuable collections, including skeletons and remains of extinct animals. Among his trophies are two gods of Egyptian character, with finely-cut features, outstretched wings, and traces of paint on their faces. The professor brought away specimens of pottery bearing a close resemblance to that unearthed in the ruins of the Old World, and also secured the secret of its manufacture from the Indians, who still make it in New Mexico.

ELECTRIC CONDUCTIVITY OF MOIST AIR.—Some electricians have held that humid air acts as a conductor of electricity; and others, notably the Count du Moncel and M. Gaugain, have maintained that it does not. Recent experiments of M. Merangoni support the latter theory very decidedly, for he finds that a Leyden jar heated so as to prevent condensation of moisture on its glass walls and thus arrest surface conduction, gives a long spark as in the driest air. When, however, the precaution of heating the walls of the jar is not taken, the moisture condenses on the latter, and forming a thin film of water, causes a silent discharge which might be mistaken for a slow discharge through the conducting air. It follows from these experiments that the loss of electricity on telegraph lines is wholly due to surface conduction over the wet and dirty insulators or leakage along entangled threads and branches of trees at particular points, and not to a general discharge into the saturated air.—*Scientific American.*

FORMATION OF ICE.—Pure water freezes at 32° Fahr., but if any compounds be dissolved in the water, these prevent it freezing at that point and lower its freezing point. Also water containing dissolved air or other gases does not freeze till these are first expelled. By boiling the water certain salts, such as the carbonate of lime, are precipitated and the gases expelled, thus leaving the water to freeze at a higher temperature than before, and at a quicker rate. The ice produced is harder, because it is free from air bubbles. These are produced in the rapid freezing of unboiled water thus: The upper surface of the water being frozen, the lower surface commences then to freeze, but before doing so it begins to part with its contained air. This air is prevented from rising to the surface by the film of ice already formed, hence it remains below in small bubbles, and ice forms around it. Such ice is of course more brittle than that which is free from these bubbles of air.

FINE RULING—ONE MILLION LINES TO THE INCH.—Mr. G. Fasoldt says, in a letter to the *American Journal of Microscopy:* I have ruled plates up to 1,000,000 lines to the inch, one of which was purchased by the U. S. Government at Washington. These plates show lines truly and fairly ruled, as far as lenses are able to resolve, and above this point the *spectral* appearance of the bands in regular succeeding colors (when examined as an opaque object) shows, beyond doubt, that each hand contains fairly ruled lines up to the 1,000,000 band. I do not believe I will ever attempt to rule higher than 1,000,000 lines to the inch, as from my practical experience and judgment, I have concluded that that is the limit of ruling.

THE ATOMIC WEIGHT OF PLATINUM.—Hitherto the atomic weight of platinum has been considered greater than that of gold; but according to the "periodic law" it should be less. K. Seubert has recently made a new and careful determination by which he finds it to be actually less, gold being 196.2, he finds platinum to be only 194.46. So that hereafter platinum will take the place which would be accorded to it if its properties were taken into consideration, and the atomic weight of the three metals leading in value will stand as follows: Iridium, platinum, gold.

THE YOUNGEST SCIENTIST.—Probably the youngest man in the world who has attained scientific celebrity is Frank Hatton, the son of Joseph Hatton, an English novelist and journalist. Frank, though but 20 years old, is the leading British authority upon the action of gases on bacteria, and has carried off the Franklaud prize for the best original investigation involving gas analysis. This talented youngster has been sent out to North Borneo and the Maylay Archipelago on a scientific and mineral exploration, this probably being the first instance on record where so important an enterprise was intrusted to a stripling.

THE composition of buckwheat has been examined by M. G. Lachartier. He states that the proportion of mineral matter in the straw increases with the weight. The straw may indeed become richer in phosphoric acid than the grain, differing thus completely from that of the other cereals. The straw of a crop of buckwheat may contain more mineral matter than does the grain. The sum of the principal fertilizers removed from the soil by an entire crop is much more considerable than for a crop of wheat containing the same quantity of grain.

INSECT SOUNDS.—Although considered mute, insects have power of producing sounds by certain movements, which, to some extent, are characteristic of the different species. The shrill chirp of the cricket is produced by the rubbing together of the wing cases. The harsh shriek of the grasshopper is caused by friction of the legs against the wings. The shrill trumpet sound of the mosquito and the busy hum of bees and flies result from the rapid motion of the wings while flying.

PROPOSED ELECTRICAL EXHIBITION IN LONDON.—An effort is being made to secure the holding of an International Electrical Exhibition in Crystal Palace, London, during the coming year. The prospects are said to be good, many of the exhibitors at Paris having agreed to contribute.

Tombstone.

Arizona's Leading District.

Ths Tombstons *Epitaph* has been pnblishing an excellent series of articles on the mines of that district, and in conclusion gives a final summary showing ths result of three years' work. It says:

It will bs rsmsmbered that the first mill—ths Gird mill, of the Tombstons Mill & Mining Co., started up witb ten stamps, dry crushing, in June, 1879. This was ths commencement of that flow of hullion that has since been stsadily on the increase until ws can look forward with surety to the time when it will exceed $1,000,000 per month and the dividends one-balf that amount.

Tombstone M. & M. Co.

From June '79 to Jan. '80, bullion product	$ 239,540 00
From Jan. 1, '80, to Jan. 1, '81, bullion product	914,389 60
From Jan. 1, '81, to Nov. 1, '81, bullion product	1,308,914 00
Total product for 27 months	$2,462,843 60

Dividends—Dividends during 1880, ten of $50,000 each; dividends to Nov. 1, 1881, ten of $50,000 each. Total amount of dividends to Nov. 1, 1881, $1,000,000.

Originally the Lucky Cuss and other mines that now helong to this company, were owned hy the Corhin company, snd worked to a limited sxtent, producing, all told, $40,000, for which ths consolidated property, as it now stands, is to he credited. This swells the hullion output of the mines of the Tombstone Co. to $2,502,843.60. As no part of the Corhin Co. product went into the fund from which the dividends were paid, it does not show in the above table.

The yield for 1879 and 1880, amounting to $1,153,929.60, came from the reduction of 19,350 tons of ore. This was an average of $59.63½ per ton.

The yield for ten month of 1881, amonnting to $1,308,914, came from the reduction of 17,650 tons of ore. This was an average of $74.16 per ton. Total ore worked 37,000 tons; average yield per ton for whole amount $66.56½. This excludes the Corhin output of $40,000 which is the product of an unknown quantity of ore.

Grand Central.

From March 10, '81, to Nov. 1, '81, bullion product	$348,176 46
Total amount of four dividends paid	$200,000
Paid first cost of mill, hoisting works, and developing mine	300,000
Total	$500,000
Ore worked, tons	18,000
Average per ton	$47 12½

Head Center.

From April 15, '81, to Nov. 1, '81	$156,520 52
Ore worked, tons	5,876
Average per ton	$26 80½

Vizina Consolidated.

From Oct. 1, '80, to Nov. 1, '81	$424,693
Dividends paid	20,000
Ore worked, tons	4,504
Average per ton	$92 44½

Boston Mill.

Product	$88,983 33
Tons of ore worked	1,906
Average per ton	$46 68⅔

Note.—This mill has worked all the Vizina ore, and that represented in this table is the aurplus that came to them in small lots from various miues in the district, which accounts for the apparent small product of the mill. The actual ore worked by the mill was 6,500 tons, giving a total yield of $513,676.33.

Western (Contention) Mining Company

From March 8, 1880, to Dec 31, 1880, product, $1,213,975.57	
From Jan. 1, 1881, to Oct. 31	1,223,168 82
Total	$2,437,144.39
Dividends paid	$1,375,000.00
Ore worked, tons	35,016
Average per ton	$69.60

The first year's outpnt of $1,213,975.57 came from ths reduction of 15,000 tons of ors, being $80.93 psr ton.

This year's product of $1,223,168.82 came from ths reduction of 20,016 tons of ore, heing $61.10 per ton.

Recapitulation.

PRODUCT.

Tombstone company, official	$2,462,843 60
Corbin, official	40,000.00
Grand Central, official	348,176 46
Head Center, official	156,520.52
Vizina, official	424,693 00
Boston Mill, official	88,983 33
Western, official	2,437,144 39
Ingersoll, estimated	15,000.00
Sunset, estimated	15,000.00
Total	$6,488,361.30

DIVIDENDS.

Tombstone	$1,000,000.00
Western	1,375,000.00
Grand Central	500 000.00
Vizina	20,000.00
Total	$2,895,000 00

TONS OF ORE WORKED.

Tombstone, official	37,000
Corbin, official	600
Grand Central, official	18,000
Head Center, official	5,876
Vizina, official	4,594
Boston Mill, official	1,906
Western, official	35,016
Ingersoll, estimated	150
Sunset, estimated	300
Total	103,442
Average per ton	$62.70

Concluding Remarks.

In our former articles and the foregoing, we have confinsd ourselves atrictly to official statements given us hy the superintendents of the various mines, with two excsptions, the Ingersol and Sunset, and those we have estimated safely within bounds. The valne of these figures, we trust, will prove as great to the public as the labor has been hard to us in their collection, compilation and publication. We now have a common atarting point for future bullion atatistics, dating from Nov. 1, 1881.

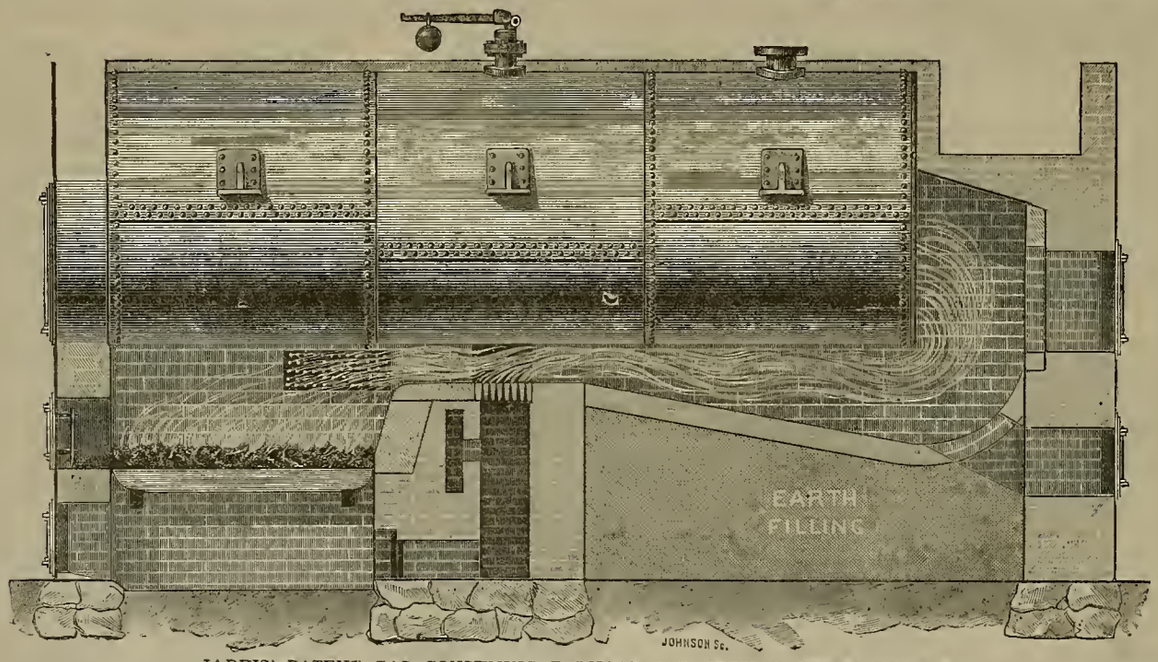
The aggregate showing will no donbt rather stagger those San Francisco and Nevada experts who have, almost to a man, reported unfavorably upon Tombstone mines. Long before this, according to their estimate, our mines ought to have been worked out and the district abandoned. It is well remembered hy our old residents, that all the mines, including the Contsntion, owned hy the Schieffelin Bros. & Gird, were at one time honded to parties in the interest of Geo. Hearst, Haggin and Tevis, for the sum of $90,000, and that Hearst—of whom we have heard it said "George never makes a mistake"—is reported to have examined the property and reported unfavorably, and allowed the hond to elapse. It is hut fair to state in this connection that Mr. Hearst now says that with him it was a simple business proposition; that he thought he could get the property for less money, therefore he allowed the bond to go by default. Be this as it may, the uniform opinion of Comstock experts has been adverse to our mines, and even to-day hut little western capital is heing invested in them. Many think this a great loss to the place, aaying in defense of this opinion that had Comstockers hold of the mines, work would be pushed with more vigor, more men would he employed, more hullion turned out, and all would end up with a grand atock "hoom," and everyone wonld have a chance to make some money. We grant that were the mines worked after the Comstock fashion, timea would he lively here and there would he an ephemeral growth in the town, soon to be followed hy a reaction similar to that in Virginia City to-day. There would he the same opportunity for the public to gamble in stocka that there was in the Comstocks and the hard-earned money of the publio would he raked into the coffers of the manipulators with the same certainty that followed each successive "deal" in San Francisco during the last 20 years.

Under ths nressnt conservative systsm of management, ws know that there are reserves of ore already dsveloped in the mines mentioned in thess reports to last for years, and havs reason to hslieve that when all their ground has been explored, other and equally good bodies will bs opened up, thus keeping up a steady yield of hullion for the next 20 years, and, for aught anyone can tell, for a century. With the new mines coming into prominence, it is a safe prediction that, ers five years havs rolled the sands of time iuto eternity, Tombstone will have acquired a permansnt population of 15,000 or 20,000 souls.

With the introduction of an ample water snpply, which is now assured beyond a peradventure, the mills will he removed from the San Pedro to the minss, and other new and larger mills will bs erected, whsrshy all ores returning $10 per ton can he mined snd milled without loss. Thers is known to hs millions of tons of ore thus far untouched that will yield in sxcess of that amount; thsrefore, ths doubt as to the fnture is solved in favor of a long and prosperous ons.

Jarvis' Patent Gas Consuming Furnace for Setting Steam Boilers.

The furnace which is shown on tbis pags, is a practical application of the Siemens' gas regenerative furnace to ths ordinary setting of steam boilers; also to the heating furnaces for smelting ores, and all kinds of furnaces aet in brickwork. It is adapted to the best and cheapest fuel, and will burn green wood, screenings, wet peat, tan hark, wet hops, spent sugar cane, dyewoods, waste of fruit packing, and any other kind of waste containing combustihles, without a hlast, effecting a saving of from 20% to 40% over the ordinary furnace, as demonstrated by many tests, and in a great measure obviating the nuisance of smoke and soot. We are informed also that it has no injurious effect on the boiler.



JARVIS' PATENT GAS CONSUMING FURNACE FOR SETTING STEAM BOILERS.

For plans and estimates for setting new boilers or re-setting boilers in use, those interested may apply to E. L. Rohbins, 210 Spear street, in this city (who is general agent for the Pacific States and Territories and ths Sandwich Islands). Mr. Rohbins will exhibit full descriptious and drawings of the Jarvis patent arrangements as applied to the common tubular boiler, the Babcock & Wilcox water tube boiler, the Corliss patent boiler, and to soda ash reclaimers. The old atyle or common setting of boilers may he changed to Jarvis' aetting in a short time.

There are general agencies for this patent at 422 East Twenty-third street, New York, 18 Second street, Baltimore, Md., 709 Market street, St. Louis, Mo., and 114 King street, Montreal. The general agency is at No. 7 Oliver street, Boston, Mass. It is already in use here hy the Standard Packing Co., tbe Contra Costa Laundry Co., Pioneer Woolen Mill Co., Philadelphia Brewery, Pacific Rolling Mills, San Francisco Tannery, etc. Some 1,400 of these furnaces are in use in the Eastern States, over 300 having heen put np this year.

Before the Camera.—We can't help entertaining a severe respect for that science which can instantaneonsly photograph a flying horse, hut forces a man to sit for four eternal minutes in front of a camera, his head braced into a pitch-fork, and his nerveless eyes staring relentlessly out into the fathomless realms of the undefinable.—*Rockland Courier.*

Dos Cabezas District, Arizona.

Editors Press:—I will in this give you hut a brief description of the Silver Cave mine and a few notes on the district.

Ths Silver Cave mins is located on an immense ledge of quartz, called tbs mothsr ledge of the district. This ledgs is traceable for a distsnce of 30 miles, and at different places the croppings are from 20 ft. to 150 ft. high and from 10 ft. to 100 ft. wide. The Silvsr Cave is the first claim located on the main ledge in this district and runs east and west. At the east or Cavs end the croppings are 100 ft. in widtb and fully 70 ft high; on ths north side is one pay streak, 16 ft. wide, that assays in gold from $5 to $20, and in silver from $18 to $40. It maintains its width and wealth for 400 ft. and shows at different places, hut smallsr and poorer, the sntire length of ths claim. In ths csnter of the claim a cross-cut tunnel has hssn run 70 ft., and has cut two pay streaks, No. 1, in the center of the cropping, is three ft. wide and assays in gold, on an avsrage, $45, and from $10 to $20 in silver. The owners, S. R. DeLong and J. S. Johnson, have worked hy ths arastra process, some 25 tons of ors from this pay streak averaging $32 in gold. In ths back end of the tunnel is streak No. 2, four feet in width, that will pay $8 per ton in gold.

On ths north sids of the main ledge is another lsdge of considerable sizs that carries some gold and dips to the south, as do all intsrvening strata of quartz and slate; and as the main ledge dips to the nortb, indications are favorahls for one ledge and fine bodies of ore at no great depth. This mine is destined to be one of the great mines of Arizona in the near future.

Mr. W. A. Neville, who has the Bear Cave honded, and is prospecting it, has not developed any honanza. Work is carried on very quietly, or secretly. Outsiders seem to know nothing of the doings at the Bear Cave.

On the 12th of November, Mr. Neville took honds on one-half of Juniper mine, and one-half of Ewell Spring mine, but the amounts of honda I have not heen able to learn. Mr. J. D. Emersley is at present doing his assessmsnt work on his fine prospects. Many of his prospects with small outlay wonld make mines of much valne. The Cincinnati and Pittsburg Mill Co. are erecting a very complete 10-stamp silver mill for custom work. The mill is from the shops of Law & Bodley, Cincinnati. They expect to have it running hy Feb. 1st.

The arastra mill of J. S. Johnson is idle at present, owing to breaking of spur wheel. New castings were ordered at the Risdon Iron Works, hnt have not been heard from yet.

Here, as in many other places, town lots seem to hs of more importance than the mines. When Mr. Neville first came here, he had the townsite surveyed, and put harh-wire fences aronnd some town lots, hy which several horses have heen crippled, and one cnt so hadly that he only lived a few minutes, hut still the wire has not heen taken down, nor any precautions taken to prevent further harm to animals.

Dos Cabezas, Cochise Co., A.T., Dec. 4th. E.

A Colorado Springs paper declares that the bullion crop of Colorado for 1881 may reach $30,000,000. Others have made the same estimate. There is no possibility of the actual returns reaching that figure. There is nothing from the mines to warrant it. If we get $23,000,000 we shall he doing mighty well under the circumstances.

California in the past 31 years has produced 54,897 flasks more of quicksilver than the celebrated mines of Spain and Austria combined.

Lecture to Young Mechanics and Apprentices.

[Concluded.]

No known degree of heat alone will separate the gases composing steam to make them assume their original state. The electric current will separate them slowly from water; with a strong current of electricity the two gases will form rapidly at their respective electrodes and escape to the surface. If collected, the same gases can be reunited by the same agency to form steam. A well-known law in magnetism is that all bodies charged with the same kind of electricity repel each other, and those charged with opposite kinds attract. In the two gases composing steam or water, we have two electric bodies of different magnetism, and when combined to form water may again be separated by a stronger magnetism or their stronger magnetic attraction for other bodies. But when combined in the form of steam the magnetic attraction of the gases for each other are satisfied, and form a molecule of steam.

The atoms of steam, when acted on by heat, may be said to be magnetized by a like magnetism, and consequently repel each other. A permanent magnet, when subjected to heat, loses its attraction. Prof. Tyndall has made a calculation of the force of attraction between the gases composing steam. He computed the force of 1 lb. of hydrogen and 8 lbs. of oxygen to form aqueous vapor, or 9 lbs. of steam, to be greater than the clash of a weight of 1,000 tons falling from a hight of 20 ft. against the earth. And that, in order that the atoms of oxygen and hydrogen should rise by their mutual attraction to the velocity corresponding to this enormous mechanical effect, a certain distance must exist between the particles. It is by the rushing over this distance that the velocity is attained, and it is by the repellant force imparted to the atoms of steam by heat, that we obtain the expansive force of steam. The greater the heat, the wider the separation of the atoms. The wider the separation the greater the power, but steam at 212° F. would require an increase of 250°, or a total heat of 462° to make it occupy the space of the original gases composing it, and to double its own volume requires an increase of 500° or a total heat of 712°, that is to double the distance between the molecules. Thus the gain in expansion is small in proportion to the increased temperature, being one five hundredths of its own volume to each degree.

If steam is thus composed of magnetic substances, and is susceptible to a high state of magnetism or electrical force, the question may be asked what effect does it have on boilers, or does it effect boilers injuriously when in this high electrical condition?

In my opinion, it does; but there are so many kinds of electricity or galvanic action, and so little known of the laws governing them, it may be even deemed hazardous to advance an opinion upon the subject.

As to subtilty of steam, it having neither taste nor smell, and being invisible at all degrees of temperature, makes it a difficult problem to solve or to tell what changes its properties do undergo at various temperatures.

And if, according to Mr. Cagnard de la Tour, the solvent power of steam is so great at 700° as to attack any kind of glass, we may safely infer it is proportionately so at all higher or lower temperatures. It has been long known that water contains a

Small Amount of Atmospheric Air,

And that the presence of this air promotes ebullition; consequently, the extraction of this air must retard ebullition. M. Donny, of Ghent, discovered this property in water, and says that water freed of its atmospheric air can be raised from 60° to 70° above its boiling point without ebullition; but when it does boil, it is immediately flashed into steam.

Prof. Tyndall says "pure ice is free of air, if melted in vacuo and will act in the same manner; if heated to the boiling point it will evaporate into steam with explosive force, and gives as a supposed cause of boiler explosions the extraction of this air from the water by long continued ebullition.

When water has been distilled over a few times without exposure to the action of the atmosphere its cohesion is increased, and owing to this increase will indicate (at a temperature of 210°), a density equal to that of sea water, from which we may infer that pure distilled water requires about the same temperature for ebullition as ordinary sea water. But if allowed free access to, or a little air is forced with it into the boiler, it will boil at the usual degree of temperature. The insipid taste of distilled water is removed by a short exposure to the action of the atmosphere. Boiler explosions are not usually charged to any explosive property in steam, but from the water in the boiler taking the spheroidal form or state, until it acquires a degree of heat near to that of the boiler, and then suddenly losing its spheroidal form and coming in contact with the over heated plates is flashed into steam, when in the spheroidal form it is buoyed up from contact with the plates by the intensity of the heat radiated, but on nearing each other in temperature it comes in contact with the plates, and instantaneous generation of steam results in explosion or bursting of the boiler.

Steam, in itself, is not explosive.

The Elastic Force of Steam

Should not be confounded with explosion.

It will fill the minutest cavities of space, and press alike in all directions, in whatever vessel it may be contained, expanding in proportion or increasing in pressure as the space is enlarged or diminished.

When superheated, it has the property of accelerating or increasing combustion. And many fires have been made to burn more fiercely when the supply of water is too small to overcome the intensity of produced heat; the steam generated only increasing the draft on the fire.

Attempts have been made to use steam as a fuel, but with doubtful success. The many uses to which it is

Applied in the Arts and Manufactures,

Mechanically and chemically, and its properties in each, are too varied to be enumerated here, when volumes might be written and not half told. Our Government has ordered, from time to time, experiments made with regard to boiler explosions; and hoards of engineers have been at work bursting boilers to find out the explosive nature of steam. Their aim seems to be more in the direction of testing the strength of the material used in boilers and the strongest form of construction, than in discovering any explosive property in steam.

If a board of eminent chemists and scientists were appointed to more thoroughly investigate the impurities in water, the gases that may be produced from the said impurities, their effect, when mingled or chemically combined with steam, its chemical or other action on the metals at different temperatures, the electrical currents produced by contact of the different metals used in the construction and fittings of steam boilers, there might be discovered the cause of many, if not all of the mysterious boiler explosions, for the electrical and chemical combinations that enter into effect in the construction of steam machinery are not half known.

If common salt increases the cohesion of water sufficiently to raise the boiling point 3° at the density of sea water and 10° at the point of saturation or precipitation, might there not be produced from mineral or chemical compounds held in solution in water a substance which, at a certain temperature, would unlock every atom of water contained in a boiler or when mixed with steam make it explosive?

The Electrical Currents

Produced by the combination of metals used in the construction of machinery, in connection with the boiler, may have some influence in separating the gases composing steam and thus rendering it explosive. The rushing of water of its air is said to make it flash into steam and may cause some of those explosions we read of. But the problem remains unsolved how that can be done in the working of the ordinary steam boiler, for nearly all pumps in use force more or less air into the boiler with the feed water, and in many instances a surplus.

Efforts have at various times been made to find a substitute for steam, but all have failed, the caloric engine coming the nearest to success.

The electric engine may supersede the steam engine in some instances, but in the production of that motor, either steam or water power is used, or a consumption of metals that will render it too expensive for general use until further discoveries are made.

The subject of steam might be extended to an indefinite length, but to sum up this article in brief, steam may be said to be a good absorbent of heat, a bad conductor, an excellent radiator, very elastic, a most useful vapor; and to it we are indebted in a great measure for the wonderful progress of the arts and sciences in the last century.

Useful Information.

A Novel Style of Steamship.—A project which is likely to assume great proportions at an early date came to light in Wall street recently. It contemplates a sweeping revolution in ocean steamship building, and it has the support of leading influential capitalists, principally Massachusetts men. Vessels are to be constructed without masts, and there will be literally nothing whatever above deck except the top of the pilot house and funnels. One of the projectors being interviewed, said: We have stepped forward to solve the problem by having our vessels covered, as with a shell, from stem to stern. This will place us above all danger of rough seas. Sweeping over us with whatever force they may, they can do no damage. No spars are torn out; no freight goes overboard; no lives are lost; everything is safe beneath the roof. The cost of the larger vessels will range from $550,000 to $650,000—at least one-third less than ordinary vessels of the same size. They are all to be built in this country. One of the objects of the enterprise is to bring back to the United States our lost commercial supremacy.

Gilding Steel.—Polished steel may be beautifully gilded by means of the ethereal solution of gold. Dissolve pure gold in aqua regia, evaporate gently to dryness so as to drive off the superfluous acid, re-dissolve in water, and add three times its bulk of sulphuric ether. Allow to stand for twenty-four hours in a stopped bottle, and the ethereal solution of gold will float at top. Polished steel dipped in this ie at once beautifully gilded, and by tracing patterns on the surface of the metal with any kind of varnish, beautiful devices in plain metal and gilt will be produced. For other metals the electric process is best.

Squeaky Shoes and the Remedy.

Preventives are always better than remedies. If you would avoid having squeaky shoes, direct your shoemaker to put some powdered soapstone between the inner and outer soles when putting them together. The "squeak" is usually caused by the friction of one sole upon the other in the act of walking. Sometimes, however, it is caused by air getting in between the inner and outer sole, in which case the pressure and bending of the leather in walking forces the air out and produces a squeaking noise. If the soles of a shoe are composed of a single thickness of leather, or two or more pieces properly glued together, they will not squeak. A piece of muslin gummed to the sides of the inner and outer sole where they come together, will also prevent squeaking. In shoes already made, and in a faulty manner, so as to squeak, make two holes, about one inch and half apart, through the outer sole, so as to insert the point of an oil can between the soles. A small quantity of sweet oil thus injected will generally cure the "squeak." If you do not succeed the first time, try again. A squeaky shoe always succumbs to the second dose of sweet oil. Three or four pegs or brads driven through the outer into the inner sole will oftentimes cure the trouble by binding them more closely together. But as trouble may arise from the pegs working through and injuring the feet, the remedies previously mentioned are preferable.

Glycerine.—It is from the candle-factories that the enormous supply of glycerine comes, which is now a very important article of trade. A few years ago it was wasted; now it is sent to the manufacturing chemist, who purifies it by distillation and filtration through bone charcoal, and puts it upon the market. It is put to a great variety of uses, many of which depend upon its peculiar properties of nonvolatility and absorption by atmospheric moisture. Harness makers and leather workers use it in making leather pliable; it is put into gas meters because it does not freeze except at a very low temperature; modelers keep their clay studies moist with it; tobacconists sweeten chewing tobacco with it, and ladies apply it to their hands and faces to soften the skin. Much of it goes into the manufacture of the terrible explosive, nitro glycerine, which is made by treating it with a mixture of sulphuric and nitric acid, or concentrated nitric acid. Not less than 3,200,000 pounds of glycerine are produced by the candle factories and utilized every year in this country, and yet so late as the year 1854 it was counted as worthless and run off into the sewers.

Hints to Users of the Telephone.—Most people, when they take up the telephone handle to listen to what the person speaking to them is saying, cram it so tight to their ear that no particle of the sound can escape. They seem to think that if they let any of the sound escape it will all go. This is a mistake, and the reason why those not familiar with its use have such difficulty in hearing what the person at the other end is saying. Too tight a pressure against the ear causes a hurring and confusing noise. Hold the receiver close to the under part of the ear, leaving an opening at the top, and the words will be heard much more distinctly. Another hint: Don't yell into the telephone as though you had decided on hurting your windpipe. Speak clearly in your natural tone of voice, keeping the lips about an inch from the telephone mouth. If you do this, you will save yourself and your correspondent a great waste of time and trouble.

How to make a Spontaneous Explosive.—The simplest method of preparing a mixture that will explode spontaneously, and that is unattended with danger if ordinary care is used, is to make a saturated solution of phosphorus in bisulphide of carbon, then to pour a small quantity of this solution upon some finely powdered chlorate of potass, resting upon paper. When this mixture is exposed to the air, the bisulphide of carbon rapidly evaporates and leaves the phosphorus behind, and in a condition of intimate mixture with the chlorate, far more perfect than could be obtained by mechanical means. On the evaporation of the solvent, as above described, the mixture presently explodes spontaneously with a loud detonation. The only precaution to be taken in performing this experiment, is to avoid taking too large a quantity of the material.

Cotton Duck for Roofing.—The use of cotton duck for roofing purposes is exciting a good deal of interest just now among agents of cotton mills now being built. The Lawrence Duck Co. have one-half of one of their mills roofed with duck, and though it was put on over a year ago, it now appears as good as new. The Pacific mills have also tested it with the most satisfactory results. These two roofs have been tested recently by experts, who found the material to have retained its bright appearance without any deterioration or apparent injury to the fiber. The Globe Yarn mills of Fall River have also adopted it for their new mill, and it is also in use by some few other companies.—*Boston Transcript.*

New Coloring Matter.—A Vienna chemist has succeeded in producing a new coloring matter on silk, which is a nice blue by day and a beautiful pink by artificial light. The alcoholic solution of this color is dark violet in a refracted, but red in direct light.

Good Health.

"Cancer Doctors."

Our advice, in the Press of Nov. 26th, to apply to a well educated physician in all cases of suspected cancers, rather than to any self-advertised "cancer doctor," has called forth the criticism of a certain party, who seems especially hurt at the term "quack." In common with others of a similar class, the communication referred to appeals to the progressive spirit of the age, the persecutions of Harvey, Jenner, and others, old fogyism, etc., *ad nauseum.* We have no disposition to enter into a controversy upon such a subject, but record our conviction that the regularly educated physicians of the present day are as fully abreast of scientific progress as any self-constituted cancer doctor can be. There has been no reasonable proposition for the cure of cancers nor any other disease, that has not been submitted by the faculty to the test of careful experiment, and there exists in London, we are informed, a cancer hospital, with a ward appropriated to the trial of new remedies for the disease. If our critic, or any other person, has a certain cure, there is an ample opportunity for trial, with a certainty of a large fortune, and the honor of the medical profession throughout the world and the gratitude of mankind as a reward. Such being the facilities afforded by the profession, it is folly for aspirants to talk of persecution, or for patients to expect relief at the hands of irregular practitioners. For our own part, we prefer to trust to the evidence of a scientific education in medicine than to the pretension of ignorant self-assertion.

How Printing Affects the Health.—Years ago there was a notion prevalent among those who were but partially informed upon the question that the printing business was especially detrimental to health. There was a tradition about the absorption of poison from the constituents of which type metal was composed. This was and is true so far as it asserts the poisonous nature of some of the constituent parts of type metal; but that these poisons should necessarily be absorbed into the system of the one who handles type is simply absurd. Printers who have such habits of cleanliness and sobriety as a decent respect for one's self and the opinion of others might be expected to dictate may follow their calling for years without experiencing any further damaging effects upon their health than what will result from close application to any sort of hard work. More "poison" is absorbed by the printer when taking observations of his little finger through the bottom of a glass than in any other way.—*The Chicago Specimen.*

Beware of Cough Medicines.—The Contra Costa *Gazette* says that at an inquest in Oakland, to ascertain the cause of death of an infant that had apparently been poisoned, it transpired that the mother had given it two doses of "Pulmonary Cough Medicine," to alleviate the croup. Dr. Buck, who made the autopsy, testified that the medicine contained laudanum in the proportion of 360 drops to 3 ozs. of the mixture, and that death of the child was caused by the excessive amount of laudanum in the medicine administered. The jury found accordingly, but cleared the mother of any intentional wrong, she being ignorant of the dangerous character of the mixture. It would appear that the law should provide safeguards that will prevent the misuse of poisonous drugs by those ignorant of their properties and effects.

Castor Oil as an Unction.—The London *Medical Journal* gives reports from various practitioners who have found purgative results to follow the inunction of castor oil. One writer states that he has frequently applied this oil to the abdomen, under spongiopiline, or other waterproof material, in cases where the usual way of administering by the mouth seemed undesirable, and with the most satisfactory consequences. In a case of typhoid fever, also, half an ounce of castor oil was applied in this manner, under a hot water fomentation, the effect of this being, as represented, to relieve the constipation and tympanitic distention that had been present, without undue purging or irritation of the bowels.

The Feet in Marching.—In order to make marching easier for the German soldiers their feet are wrapped in linen soaked with lard. But, on the march, especially where the roots are too big, the sticky mud will pull the boots off. During a parade before the Emperor, not long since, the boots came off by the hundreds, and a large fatigue party had to be sent out to pick up the foot gear.

The Third Set of Teeth.—Professor Owen, in an article lately published, questions whether man ever receives a third set of teeth. He ascribes alleged cases to the re-appearance of old and worn stumps, in consequence of the shrinkage and absorption of the jaws.

For Earache.—It is stated that asafœtida dissolved in water is a good palliative for the earache. Warm a few drops and drop in the ear, then apply wool to keep out the cold.

MINING AND SCIENTIFIC PRESS

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Passing Events.

The MINING AND SCIENTIFIC PRESS this week consists of 32 pages, replete with matter of interest and importance. It is devoted mainly to the interests of Arizona and New Mexico, but the usual departments will be found and much additional general matter.

From what we have said on another page it will be seen that our representatives in Congress are hesitating themselves in calling the attention of the Government to the debris question in California; and that they propose stone dams as remedies, said dams to be paid for by the general government. Our correspondent in another column has something to say on this subject.

The Gold Run mining case, involving the debris question, still continues at Sacramento. Testimony is now being taken on the miners' side, the most important witness being Hamilton Smith, Jr., Pres't of the Miners' Association, and one of the most prominent hydraulic mining engineers on the coast. The testimony is mainly as to the value and yield of the mines.

The Big Bend Tunnel.

A Great Enterprise for Working an Auriferous River Bed.

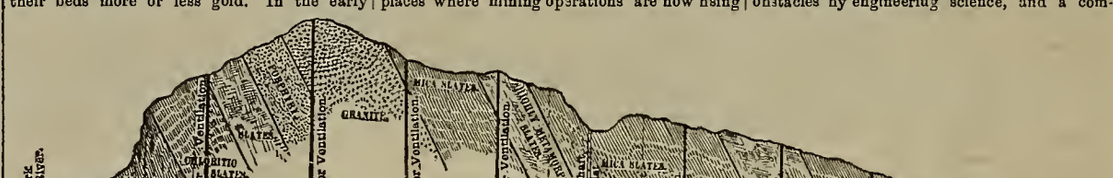
California is happy in being one of the few places in the world where auriferous earth exists, in the form of placers, gravel beds, drifts or bars. In consequence, all the rivers in the regions where these deposits occur contain in their beds more or less gold. In the early days of California fabulous amounts were taken from the river bars; and from the beds of rivers where the water was turned aside by wing dams. Of course, many localities were left unworked, owing to the heavy bodies of water passing over them; and others again were passed by because no adequate means of working them were thought of by the careless miners of those days. All old miners knew of these places, and many are the plans that have been drawn up for getting at them, the only drawback being, what is so commonly the case, lack of money to do the necessary work. In a number instances attempts were made to get at the rich bottoms by crude means and temporary structures, but it takes organized capital to attempt any such work on a large scale.

It has been known for many years, and the fact is substantiated beyond doubt, that Butte county contains some of the richest auriferous deposits in the world. Feather river and its tributaries have added many millions to the world's volume of gold coin, and wherever the beds of the streams have been mined, or in places where mining operations are now being carried on, the returns have been, and are very generous. A notable instance was that of the "Cape Claim," situated about one and a half miles above Oroville, on the Feather river, in Butte county. In the year 1857, a party of miners organized a company with a capital stock of 200 shares, of $600 each; at a cost of $120,000, they built two dams across the river, 3,400 ft. apart, with a flume of sufficient capacity to carry the whole body of water in the river past both dams, and discharging into the river below the lower dam, the water between the two dams being pumped out by means of the power afforded by the main flume. When the water of the river bed between these dams was exhausted, men were set to work shoveling the gravel into "long toms," and sluicing in the most primitive manner, yet, the returns were simply enormous; then, an unseasonable and unexpected rise in the river carried away the entire works in a single night, and the books of the famous "Cape Claim" were closed.

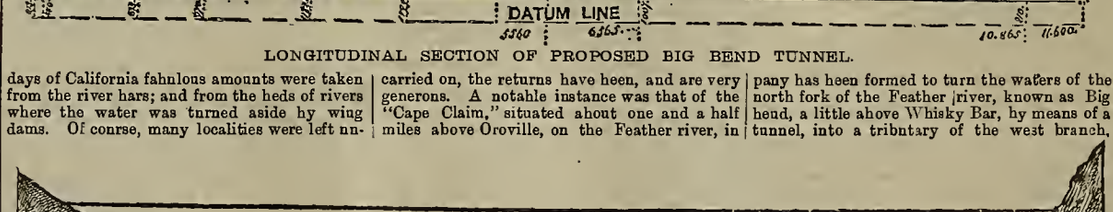
It is now proposed to get at these riches in a systematic way, and to overcome the existing obstacles by engineering science, and a company has been formed to turn the waters of the north fork of the Feather river, known as Big bend, a little above Whisky Bar, by means of a tunnel, into a tributary of the west branch, called Dark canyon, which empties into it a few hundred feet above the confluence of the west branch and north fork of Feather river, about 10 miles above Oroville, Butte county. A great many people have thought something of this kind could be done, but it was only within a year that the project began to assume shape, and was seriously investigated by Col. J. C. Lo-

(CONTINUED ON PAGE 417.)

MAP SHOWING BIG BEND, NORTH FORK OF FEATHER RIVER, AND LOCATION OF TUNNEL.



LONGITUDINAL SECTION OF PROPOSED BIG BEND TUNNEL.



CROSS SECTION OF NORTH FORK OF THE FEATHER RIVER AT BIG BEND TUNNEL.

Yuma.

We give on thia page an engraving of Yuma, the county aeat of Ynma county, Arizona, which ia aituated near the jnnction nf the Gila with the Rin Colorado, and ahout 20 niles north of the Sonora line. On a commanding bluff, opposite the town, on the California eide of the river, is Fort Yuma, built on the aite of a miasion eetahlished here hy the Spanish fathera as early as 1771, and deatroyed hy the Yuma Indiana 10 yeare later. The firet eettlement at the aite of the town of Yuma was made hy Dr. Lincoln and others in 1849, who eetahliahed a ferry over the Coloradn to accommodate the thousande who flocked to the newly diecovered gold region of California. An outhreak among the Indians dcetroyed the ferry and killed all the owners except three persons. In 1850 the ferry waa again started hy Don Diogo Jaeger and othere. The party wae again attacked in 1851 hy the Indians, who compelled them to abaudon their enterpriee and retreat tn California. In 1852, Heintzelman and Stoneman (both of whom afterwarda roae to high commanda in the civil war), marched across the Colorado deeert with a detachment of United States troops, and eatahliehed the post of Fort Ynma. The ferry wae again started, and the village of Arizona City grew up around it. In 1864, Yuma wae made thedietrihuting point for the military poste in Arizona, and advanced rapidly in population and huaineaa. It containe several large etores, three hotels, (one owned hy the railroad company), a large wagon ehop, blackemith ahope, saloone, etc. It has one pnhlic echool, with a daily attendance of 50. The Sieters of Charity have aleo a flonrishing echool at this place. The Territorial prieon ie eitnated here. It is a eccnre and roomy etructure, huilt of stone, and aitnated on a hluff above the Colorado. The railroad company have huilt exteneive ehops at thie point and give employment to a large nnmher of men; they have also erected a fine hridge over the Colorado. The popnlation ie about 1,200. Yuma'e eituation at the junction of the two largeat etreams in the Territory, the rich mining counitry which lies to the north and eaat of it, and its nnrivaled climate for those trouhled with lung dieeaaes, will alwaye insure ite permanency and proeperity.

Theee faces, which we take from the pamphlet on Arizona issued hy authority of the Legielatnre, are eupplemented hy the remarks of onr epecial correspondent which we give in another column of thie ieeue.

Sulphuret Ores.

In many inetancee, the emall aize of quartz veins, the hardneaa of the country, distanee from centere, preeence of water, etc, render quartz mining unremunerative; hut in a great nnmher of instancee, the ahandonment or neglect of onr quartz veine ie dne to want of experience and want of proper appliances, rather than to the poorneee of the qnartz. Again, the comhination or aeeociation of other metale with the gold, tende to leseen the value, and in the ahsence of the meane of separating and saving the whole of theee metale, and the ekill to employ euch meaus to the greateet advantage, eome veine are regarded ae unremunerative, which, under ekillful management, would prove highly remunerative.

Taking into conaideration the large number of quartz veine on thie coast up to the present time, comparatively little attention hae heen paid to the eaving and treatment of pyritee. In many instancee, quartz heavily charged with pyritee, is crushed at a hattery where there are no appliancee for eaving them, and where, in fact, no attempt is made to save them. Theee pyrites are frequently carried off with the tailinge into a creek and loet. The loss eustained hy the waste of euch material, though there are no meane of eetimating ite extent, must he very great, and what is woree, the loss may he eaid to he irreparahle, hecanee it would he impossihle to collect the material again. If the gold thus lost could have heen eaved, many claime ahandoned as nnremnnerative might have heen worked with profit for yeare to come.

We have ahundant proof that minee that pay under some circumstancee, will not pay under others. We know that many minee ahandoned 20 years ago in California, are heing made to pay now through hetter conditione, greater care, more metallurgical skill and improved appliancee. It ie to he hoped that many yeare will ont elapse hefore eome perfect, simple, and ahove all, cheap means will he found to work onr snlphureted ores, in which caee, hundrede of mines now idle will he started up, and many never opened will he developed.

THE county eeat of Alturas county, Idaho, hae heen settled in favor of the town of Hailey hy a decision in the District Court, juet rendered hy Judge Prickett, who decidee that Hailey, not Bellevue, is entitled to the county eeat. This will give a hig etart to the town of Hailey.

THE output of hullion from Georgetown ie largely increaeing, and in a ehort time new reduction worke will he required.

[Published by permission of E. Conklin, Author of "Picturesque Arizona," etc.]

VIEW OF YUMA, YUMA COUNTY, ARIZONA, WHERE THE SOUTHERN PACIFIC RAILROAD ENTERS THE TERRITORY.

Bullion Product of New Mexico.

Very little has heen done in the way of developing the eection'e mineralogical reeources, as may he eeen from the following tahlo, whioh affords a close estimate of the yield since New Mexico heoame a portion of the territory of the United Statee:

1848 to 1868	$2,500,000
1868	250,000
1869	500,000
1870	500,000
1871	500,000
1872	500,000
1873	500,000
1874	300,000
1875	325,000
1875 to 1880	2,200,000
Total 1848 to 1880	$8,075,000

But it ie etill helieved that the developmente will prove that the Territory ahounde in earthly treaeuree. Saye the *Sentinel*, epeaking on thie point: "The minee and placere and coal fielde of the Territory eeem, from the discoveriee made and from the indications, to exiet, acattered all over the country. Gold, eilver, iron, quicksilver, marhle, coal, hnilding etone and precioue etonee—indeed, nearly all metale and other productione of the grnund which contrihute to the nse and pleasnre and wealth of men—appear to exiet in New Mexico. The valnahle oree ahonnd almoet everywhere in the granite and gneies of the Rocky mountains, and the economic queetion ie not to find the material, hut the capital and lahor with which to work. That the conntry over which theee inveetigations were made ie replete with thoee minerale, which, hy their decompoeition, are fonnd hy experience to moet enrich the eoil, ae it ie with the heforo mentioned minerale of commercial value.

"Gold ie known to exiet in over 50 different localitiee in the Territory. It and eilver must have heen known and exteneively mined hy the Aztecs, ae the preeence of their old ruine is said to hean almoet unfailing indication of minee. The Spaniarde mined gold, eilver and copper in thie region, and Jeeuit prieste more thoroughly proepected it than it hae heen since. They reported at all pointe great richee and the exietence of all the precioue metals. At the Placer monntain, the Old and New Placer quartz lodee have heen opened eince the war.

"At the Moreno minee, at Ute creek, and other trihntariee of the Cimarron and Red river, large depoeits of gold have heen diecovered and worked.

"At Pinos Altoe, quartz gold mining hae received considerahle attention. Thirty lodes were discovered, paying from $40 to $200 per ton. In thie dietrict a few years ago 30 lodee of gold quartz were worked, 10 of eilver or a comhination of eilver and gold, and three of copper. There have heen picked up in one day in a gulch at Pinoe Altoe orea of gold, eilver, lead, zinc, magnetic iron and plumhago. The nnmher of minee now worked there hae largely increaeed.

"Twenty-eeven milee from the city of Santa Fe is the Real de Doloree or Old Placer, diecovered in the year 1833, and from then up to 1840 it contained a popnlation varying from 2,000 to 3,000 pereone, the most of whom were engaged in waehing out gold, lahoring under great dieadvantage on account of the ecarcity of water, it heing neceeary to carry the dirt to the water, a dietance of nearly two milee, or pack water in kege and harrele to the dirt; there were at one time some dozen or more etoree there with merchandiee. The amonnt of gold taken out hy this rude proceee is varionely eetimated from $300,000 to $500,000 yearly. Many rich goldhearing quartz lodee were diecovered, hut owing to the want of water and proper machinery were not worked to any extent."

I have eetimated the production for the calendar year 1880 to have heen: Gold, $130,000 eilver, $425,000; total, $555,000.

The Bisbee Copper Mines.

The town of Biehee ie eituated 50 milee, hy etage, and ahout 25 hy trail over the mountaina eouth of Tombetone. Here are located eome of the richeet copper minee yet fonnd in the Territory. The Copper Queen ie an extraordinary mine, and the most exteneive. Ite exploratione extend for many hundred feet, and ite output ie immenee. Two 30-ton emeltere are kept running constantly; the daily output ie from 12 to 15 tone.

The ore ie the red and hlack oxide of copper. Some magnificent epecimene of crystalized green carhonate of the ore heing fonnd, we hrought away one epecimen whioh hse not heen excelled. Ore is ahundant everywhere, in fact, the mountain seems to he composed of it. The mines are 20 miles from the Sonora line, and 75 from Beneon, on the Southern Pacific railroad.

The mine is owned mostly in New York where the headquartere are. Thie mine hae produced eomewhere in the neighhorhood of a million dollars. The Neptune company own several claims at thie place and have a emelter erected eome nine or ten milee from Bisbee on the San Pedro, which at this point ie a small stream. The Twilight, Bounty, Galena, Cave, Garfield, Golden Gate, Copper King and othere are located at thie point, and all have more or less ore. The per cent of copper is from 5 to 25.

ORE and hullion etill continue to arrive in Salt Lake from Wood River.

On the Milling of Gold Quartz.

[Written for State Mining Bureau by MELVILLE ATTWOOD.]

H. G. Hanks, Esq., State Mineralogist.—Dear Sir: My last paper to the State Geological Society on the "Milling of Gold Quartz," wherein I tried to describe the process of simple amalgamation of the raw pyritic matter in wooden barrels, appears from the great number of letters that I have received respecting it, after its publication in the MINING AND SCIENTIFIC PRESS, to have attracted considerable attention, and has, therefore, encouraged me to resume the subject, but this time as a contribution to the Mining Bureau; you having kindly offered to allow the specimen accompanying this paper, and intended to illustrate what I have stated, to remain for a short time at the rooms of the Bureau, to give those who feel interested in the matter a chance of examining them. You have also promised to put some very important and interesting specimens from your private collection with them.

I can only now repeat what I have stated on a former occasion that at the present time I think scarcely anything can be of greater importance to the mining interests of this State, than a simple and cheap mode of extracting the gold from low grade vein-stone, and the determination of the true condition of the ores associated with it.

The "Free Gold,"

As it is called, can easily be saved, indeed, in the language of the old millman, "only give it a chance and it will take care of itself" is very true, particularly so when met with, as it is in some of the Bodie veins, carrying scarcely any pyritic matter. The difficulty in the

Concentration of the Sulphurets.

(I use the Californian term, which, as I stated before, was, I think, first applied in Nevada county, in 1859, to the pyritic matter associated with the quartz in the gold bearing veins of this State), appears now to be, in a great measure, overcome by the use of the "Frue concentrator," which, with comparatively little attention, and at one operation, makes very clean work. I have served a very long apprenticeship in the "dressing" of different kinds of ores, but in all my experience never remember any machine which pleased me better than the "Frue." The rubber surface of the revolving cloth appears to greatly assist the operation.

The question of concentration being now so far solved, it renders it desirable, indeed necessary, for isolated mills to have some cheap and easy mode, which they can use at their own works, to extract the gold from the concentrations.

The following is a copy of a paper on "Iron Pyrites" read before the Royal Society of New South Wales, in 1874, by J. Latta, Esq., which contains much valuable information:

"*Mr. President and Gentlemen:*—At the request of some of the members of the Royal Society, I have ventured to occupy part of your time this evening in describing the method of

Treating Pyrites for the Extraction of its Gold,

As carried out by the Port Phillips company, at Clunes.

"In 1861, I was engaged by that company as their chemist and assayer, with special instructions to devise, if possible, a process for profitably extracting the gold from their pyrites, which was then but little better than a waste product. Except processes inapplicable to our circumstances, such as smelting, etc., the only known means for extracting gold from such mineral was that practiced in South America and the United States,—'of exposing the auriferous sulphides to the action of air and moisture for a year or so, whereby a portion of the mineral became oxodized, liberating the gold previously enclosed by the sulphides, the mineral was then passed through the stamping battery with quartz, and whatever portion of the sulphides remained undecomposed was retained, as well as the then rude machinery for that purpose admitted, to undergo another term of oxidation, and so on whilst any remained.' I scarcely need to point out how extravagantly wasteful of time and gold such a process must have been. Yet even at the present time this process is occasionally practiced in Victoria. At some claims the blanketings—that is the pyritous sand, with a little free gold caught upon the blankets—are, after a time, again put through the batteries with the quartz, for the purpose of extracting its gold. Any one practically acquainted with the treatment of mineral containing fine gold by the battery process, will at once recognize the impossibility of retaining a fair proportion of such minutely divided gold as oxidized pyrites affords; by far the larger portion would be held in suspension by the water, and be carried away by it through all the appliances devised for its retention. In addition to the difficulty of retention arising from the fine state of division which gold so obtained possesses, most of these particles would be

Coated With Iron Oxide,

And other products of the decomposed mineral, thus offering another hindrance to its chance of amalgamating with the mercury. This latter difficulty deserves careful consideration, where fine gold has to be dealt with, as from its fineness it escapes the scrubbing which the larger grains receive from contact with the quartz whilst crushing, whereby their surfaces are cleaned, and thus rendered extremely sensitive to the influence of mercury placed for their detention. In reference to the condition of the gold in pyrites, it has come to be pretty generally admitted that 'nearly, if not quite, all the gold exists in the metallic state.'"

This quite agrees with the results of some experiments carried out by myself in conjunction with Mr. Daintree, late of the Victoria geological staff. Our researches ended in obtaining but the barest possible evidence of

Gold Existing in a Mineralized State in Pyrites.

As a matter bearing somewhat in support of this result, and whilst engaged in these investigations, I had the good fortune to come across some fine specimens of cubical pyrites, which upon examination with a pocket lens, seemed to indicate the presence of gold; upon transferring them to a good microscope, gold was distinctly seen upon the planes of cleavage, and upon dissecting the crystals, every cleavage face was found distinctly gilded. Now, from the fact that the presence of gold could only be determined by the aid of a good microscope, and that only as a fine gilding, some notion may be formed of the excessively fine state of its division, and how unsatisfactory would he the task of separating such liberated films from water in motion.

Guided by these considerations it became evident that any attempt to mechanically separate gold from pyrite—unless aided by the previous decomposition of its enveloping sulphides—must prove ineffective from the impossibility of reducing it to its ultimate atoms, for so long as a cluster of sulphide atoms remain unbroken, they might reasonably be imagined to enclose those of gold. Again, it was equally clear that, when such gold was liberated from its envelope, water concentration alone was inapplicable. To test the correctness of these conclusions, each of them was made the subject of rigid experiment on an extended scale, before receiving them as fundamental truths to guide us in determining the best method suitable to our requirements. Two parcels of pyrites of twenty tons each—one roasted, the other unroasted—were ground in one of the best arastras known, with mercury; a constant stream of water flowing through to carry off the finely ground sand, which was then carried through mercury boxes and over blankets. Each parcel received the same amount of grinding and treatment in every detail. The results are as follows:

Twenty tons raw sand containing 3 oz. 6 dwts. per ton
Gold obtained.....29.21 p. c.
" in tailings.....42 84 "
" carried off in water.....27 95 "
Twenty tons roasted sand, 1 oz. 7 dwts. 10 grs. of gold per ton.
Gold obtained.....51.57 p. c.
" in tailings.....27 21 "
" carried off by water.....21 22 "

Here it will be observed that, with the raw sand, only a small portion of the gold was obtained—a very much larger was left in the tailings, although finely ground, and a large proportion was carried off with the water as slime. With the roasted mineral more than half the gold was obtained; the tailings were much poorer than those from the raw sand, but still very rich, and a large quantity was carried off by the water.

After carefully considering the merits of the various methods suggested for extracting gold from pyrites, our first problem to solve was how to best

Destroy the Enveloping Sulphides

And arsenides, so as to get rid of the deleterious action of these minerals upon the mercury used for amalgamating and detaining the liberated gold; and, secondly, the best method of extracting the gold from the decomposed pyrites. After a number of experiments on a large scale, it was decided to effect the decomposition of the pyrites by a roasting process. To effect this economically, I devised, and in conjunction with Mr. H. A. Thompson, patented, in 1862, the

Inclined Roasting Furnace,

Which is now used in many places throughout the Colonies. It consists of an inclined roasting hearth, usually about 30 ft. long by 5 ft. wide; the fire-hole for heating the hearth on the lower end of it, and is separated from it by the fire bridge; between the latter and the hearth is a channel for conveying into the store-pit the sand when roasted. In the foot wall of the furnace are 6 tubes, from 1½ to 2 inches diameter, for supplying heated air to the roasting sulphides; scarcely any air is admitted through the fire bars, the gaseous vapors from the fuel being completely burned by the great excess of air passing over the fire for oxidizing the pyrites. Along each side of the furnace are five working doors, for the workmen to turn and rake down the mineral. Above the upper end of the furnace a large hopper is constructed capable of holding 24 hours supply of sand; in the floor of this hopper is a trap for supplying mineral to the hearth; the hopper is filled by trucks communicating with the puddles by a tramway to the stamp-house. The whole of the furnace is carefully braced with vertical longitudinal and transverse ties. The present furnace has been working about ten years, and, with fair treatment, will last many years more. In working this furnace the whole of the hearth is covered with pyrites to the depth of between 2 and 3 inches, kept at a gentle red heat, with frequent stirring, until the mineral nearest the fire, and about 6 ft. beyond it, is found no longer to give off sulphur fumes. An experienced workman can determine when this condition has been attained by its appearance in the furnace. It is then raked into the discharge channel and the mineral lying upon the hearth immediately above that removed, is brought into its place; again, that still further up is brought a stage lower, until the whole has been shifted, when the vacant place at the upper part is refilled from the hopper. The sulphurous and arsenical vapors, together with the products of combustion and dust from the pyrites, pass into a tunnel between 200 and 300 ft. long, 4 ft. high, and 3 ft. wide, carried up the side of a hill, terminating in a chimney 30 ft. high. Nearly all the sand and dust carried over by the draft is deposited within 40 ft. of the furnace, and is periodically removed for re-treatment, as it contains a notable quantity of gold; beyond 40 ft. the sand is worthless. From the size of the tunnel the vapors move slowly onward, and have, consequently, time to deposit any heavy particles; continuing their course, the vapors pass through 6 cellular brick screens, down which a powerful spray of water passes; here they get cooled and scrubbed, the sulphurous and sulphuric acids dissolved out, whilst the arsenious acid is deposited on the floor of the tunnel, scarcely anything escaping from the chimney but the foul vapors. Some alarm was felt by the Town Council lest any

Arsenical Vapors

Should escape and prove injurious to the inhabitants, as the works were close upon the township, and they placed the matter in the hands of Mr. Johnson, the Government analytical chemist, for investigation, who reported as follows: "I drew five gallons of the vapors from the chimney of the roasting furnace, and by the application of one of the most delicate tests known to science, viz, Reinck's test, discovered but the merest trace of arsenic." I may remark that when this investigation took place we were condensing over two tons of arsenic per month in the tunnel. I have dwelt somewhat lengthily upon this part of my subject as I am desirous to show that, with due precautions, such operations can be safely carried on in the neighborhood of habitations.

In carrying out the roasting operations the work is divided into three shifts of eight hours each, one man being able to attend a furnace, and finally to cover up the hot sand discharged with damp sand and spray it with water. This quenching was found to be a matter of some importance, as the quartz sand—always found with the pyrites—is thereby broken up and rendered friable, by which the after process of grinding is greatly facilitated. The quantity of sand which a furnace of the above-mentioned size can treat, will average 4 tons per 24 hours with a consumption of 3-10 of a cord of wood per ton. Having determined upon a

Mechanical Process for Extracting the Gold

From the roasted mineral, it became necessary to discover the best condition for accomplishing it. In this, also, we were greatly assisted by the knowledge gained of the physical condition of the gold in pyrites. Consequently, after our earlier experiments already mentioned, we carefully avoided a current of water, and ground with mercury without an overflow until it was considered the gold had become amalgamated. By cautiously varying the experiments, and ascertaining the proportion of gold obtained in each case, we were led up to the present method of working. From the results of a great number of experiments, it was shown that the quantity of water used in the grinding process was a matter of considerable importance, the success of the operation to a great extent depending upon the sand being in a damp condition only; by this means the mercury becomes thoroughly diffused, and every grain of sand has a particle of mercury in contact with it, consequently there is afforded abundant opportunity for the gold to amalgamate. On the other hand, if sufficient water has been used to convert the mass into a semi-fluid state, the mercury remained at the bottom of the mill, the surface only being in contact with the sand, consequently the opportunity for amalgamation was considerably lessened, and the quantity of gold extracted very much less than when working damp sand only. As the result of these experiments, the following process has been adopted: The sand, after being roasted, is ground—only moderately damp—with an equal weight of mercury for three-quarters of an hour, under the rollers of an ordinary Chilean mill; water is then allowed to flow into the basin, the mill still revolving, until nearly all the finely ground sand has been carried off in the overflow to the concentrator; the mill is then stopped, the water drained off from the unground sand and mercury, again started, and re-charged with fresh sand, and so on until it is necessary to clear out the amalgam—generally once a week, depending upon the richness of the mineral treated. The finely ground sand passed into the concentrator is kept slowly stirred for a quarter of an hour, to keep the sand in suspension in the water, and allow the mercury and any amalgam which might have been carried over from the mill to gravitate through it; the water with its sand is then slowly run through a smaller concentrator, to retain any valuable particles which might have escaped the first, and is then considered sufficiently impoverished to be allowed to run away.

The quantity of roasted mineral the company treat by this process, when working, averages 18 tons per week—the duty of two mills worked in eight-hour shifts, one man attending them, alternately charging and discharging.

The Average Proportion of Gold Extracted

During the last year, from 294 tons of pyrites, amounted to 95.19 per cent. of the assays, the sand averaging 4½ oz. of gold per ton. Some of the parcels returned as high as 98 per cent. during that period. The cost of extraction amounted to £2 2s. 4d. per ton, without estimating wear and interest on capital. The above charge is rather high, as fuel during that period was unusually dear, and the furnace being but 4 ft. wide instead of 5 ft., increased the labor cost, as less work is done at the same cost than would be incurred in working a larger furnace. Another element in the cost is the mercury which is lost, amounting to 1 lb. 13 oz. per ton—a large proportion of which, I think, might be saved by improved appliances for that purpose, together with the gold contained in it. The immediate cause of this loss of mercury is the severe trituration to which it is subjected with the sand. This was found indispensable, for whenever, through oversight or experiment, a less degree of trituration was applied than that now used, or the sand ground too wet, the return of gold was invariably diminished by several per cent.

In carrying out these operations, I found that a large proportion of galena in the mineral seriously interfered with the extraction of the gold, but a small proportion of the sulphides of copper, zinc or lead, produced no appreciable effect.

Taking the process as it stands, we have been unable to find one that would at less cost extract the same proportion of gold, or could be safely trusted in unskilled hands with only occasional supervision.

Mr. Thompson also read the following return:

Returns of pyrites treated at the Port Phillip Co's. Works, Clunes, since Oct., 1866. Minerals treated: 1867, 215 tons, 17 cwt.; 1868, 366 tons 9 cwt.; 1869, 401 tons 11 cwt.; 1870, 431 tons 9 cwt.; 1871, 561 tons 2 cwt.; 1872, 368 tons 6 cwt.; 1873, 294 tons. Gold, contents per ton, per assay: 1867, 4 oz. 16 dwts. 6.93 grs.; 1868, 3 oz. 18 dwts. 6 56 grs.; 1869, 4 oz. 1 dwt. 19.15 grs.; 1870, 3 oz. 11 dwts. 4.34 grs.; 1871, 4 oz, 7 dwts. 10 99 grs.; 1872, 5 oz. 18 dwts. 19 36 grs.; 1873, 4 oz. 10 dwts. 16.30 grs.

Total gold obtained: 1867, 960 ozs. 13 dwts.; 1868, 1,322 ozs. 13 dwts.; 1869, 1,515 ozs. 11 dwts.; 1870, 1,370 ozs. 4 dwts.; 1871, 2,290 ozs. 1 dwts.; 1872, 2,031 ozs. 9 dwts; 1873, 1,268 ozs. 17 dwts. 12 grs.

Gold extracted, per ton: 1867, 4 oz 9 dwts.; 1868, 3 oz. 12 dwts. 4 grs.; 1869, 3 oz. 15 dwts. 11.60 grs.; 1870, 3 oz. 3 dwts. 12 60 grs; 1871, 4 oz. 1 dwt. 15.20 grs.; 1872, 5 oz. 11 dwts. 22.56 grs.; 1873, 4 oz. 6 dwts. 7.63 grs.

Percentage of gold extracted: 1867, 92 43; 1868, 91.71; 1869, 92.28; 1870, 89.24; 1871, 93.34; 1872, 94.22; 1873, 95.19.

The results obtained by Mr. Latta, appear to have been exceedingly close and satisfactory, though rather costly—about ten dollars per ton—which, I think, could have been much lessened had the stuff been reduced finer, and the concentration been carried a little further, so as to have freed the pyrites from the excess of gangue or quartz sand previous to calcination.

It is now generally admitted by metallurgists of any note, that the gold in pyrites exists in a metallic state, and it is with no little pleasure that I am enabled to

Practically Corroborate the Statements

Of Mr. Latta on this subject, having procured for your inspection a number of crystals and fragments of crystals, of auriferous pyrites, obtained from different parts of this State. They are mounted on glass slides for microscopic examination—as with a common lens the presence of the gold can hardly be detected, but with a good microscope, using an inch or half inch objective, it will be found that the faces of some of the crystals are, in places, most finely and beautifully gilded, and that, here and there, are seen little specks or drops of gold, partially imbedded in the pyrite.

The mill-man after looking at these specimens, will not be surprised at the loss sustained in the wet stamping of auriferous pyrites.

It will generally be found amongst those who most strenuously favor the idea of the existence of rebellious gold ores, are men who have a valuable mine to sell, results from which can only be obtained by vapor assays (see MINING AND SCIENTIFIC PRESS, Jan. 17th, 1880, and Oct. 9th, 1880.); or the man with a process, by which he professes to extract all the gold from rebellious ores, or even that which is said to exist in the Calistoga water (the best results from which are obtained when chloride of gold is added). In Phillip's Metallurgy, page 166 and 167, very good directions are given for

Sampling and Assaying Gold Quartz.

For assaying, he says: "The most accurate results are obtained by carefully washing a four-pound sample in the batea. After having in this way concentrated the gold in about an ounce of sand and pyrites, this residue may be either subjected to assay, or the sulphides dissolved by nitric acid, and the gold extracted by amalgamation with mercury, which is subsequently volatilized, and the gold weighed. In either case, calculations are made on the four-pound sample, and when the residue has been subjected to fusion, very accurate results are obtained."

During the time I was engaged in gold mining in Brazil, I stayed for some time at the St. John del Rey mine and there witnessed the

Barrel Amalgamation,

Which I described in my last paper to the State Geological Society.

By careful analysis their concentrations differ but little from those of some of the mines near Sonora, Tuolumne county, Cal.; the amount of arsenic varying from one to ten per cent., though in the upper part of the St. John del Rey mine, it did not contain so much arsenic as the following analysis, made by John A. Phillipe in 1847, shows.

Analyeis of uncrushed ores from the St. John del Rey mines, made by J. Arthur Phillips, in 1847:

Silica	16.87	
Carbonate magnesia	12.17	
Carbonate lime	3.01	
Sulphur	16.77	Iron Pyrites.
Iron	14.65	
Peroxide of iron	32.84	
Peroxide of manganese	3.63	
Arsenic and gold	Traces	
	99.94	

N. B. Gold per ton equal 1 oz. 2 dwt. 20 gr.

The reason I have said so much about those mines and called your attention so frequently to them, is from the fact of their successful treatment of such a difficult vein-stone for so many years. To properly understand the magnitude of the work, suppose we estimate the yield of the vein-stone in California, from all the mines in pyritic matter, to be, say 5 per cent. of all that is worked—which is rather high—it will hardly equal that treated daily at the St. John del Rey works.

The results of years of experience in working such a mine ought to be interesting even if it were not exceedingly valuable, as it really is; yet there are not wanting those who object to any information obtained from the reports of such as the St. John del Rey Co. on the—not very wise—grounds of the mine being worked in Brazil, and the reports printed and published in London and, may be worse than all, that the dividends are, and have been for the last forty years, paid there. In the

Milling of California Gold Quartz,

I would advise, for low grade rock, the stamping of it as coarse as such a machine as the "Frue," or other improved concentrator can treat to advantage. The size of the aperture in the screens should gradually increase, and be the largest in the upper part, which would, in a great measure, prevent what is termed "dead stamping," and, at the same time, add greatly to the duty of the stamps. Screens having 12 holes to the linear inch in the bottom and 10 in the upper part, are not too coarse for low grade rock. The fineness of the stamping, however, is in part regulated by the position of the screen, that is, their horizontal distance from the stamp-head and the vertical hight of the bottom of the screen above the level of the die. For example, the finest work is done by splash-stamping, that is, without using any screens, and allowing the pulp to be discharged over the front side of the mortar, which is purposely made lower than the back or feed part of the mortar.

The Port Phillip Co., in Australia, I believe, use them with 10 holes to the linear inch. Steel wire-cloth is the best and will, I am told, last better than any other.

Some years ago, in a communication to the State Geological Society on the subject, I recommended fine stamping for low grade rock containing a large proportion of sulphurets; but recent improvements in concentrators, and a closer examination of the condition of the gold in the iron pyrites, of which I find so large a proportion is in thin films, and which, with a rapid flow of water, would be carried away, and a greater part of it lost, have altered my opinion on this point.

It is not generally known, but nevertheless, from numerous and very careful tests, it is proved that in fine stamping, when the speed of the stamps is above seventy blows per minute, that the loss of gold, when blankets, or raw hides, are used, is much greater than at a speed of fifty blows per minute; though I am not aware that any tests have been made when the amalgamation was done in the battery. The system of

Amalgamation in the Batteries.

However, I have always considered a mistake and as entailing a great loss of gold, particularly so, when the rock contains a large proportion of sulphurets; besides, if precautions are not taken, a low degree of temperature will render the amalgamated silver plates nearly useless. To understand this correctly let the mill-man put two or three barrowfuls of rock, very rich in sulphurets through the stamps and then watch the effect on the amalgamated plate, and at the same time collect some of the pulp after passing over the plates, and have it carefully tested and he will then better understand why I prefer the blanket system.

Prof W. W. Smyth, in one of his lectures on gold, with respect to stamping, says: "Take a large hammer and gently crack a nut with it, and you have an illustration of what a stamp had ought to do; it ought, if possible, to crack the enveloping shell of stone, and set free the kernel of metallic mineral unbroken."

Or, for instance, take a piece of veinstone from the Bodie district—the same as marked No. 26—one-half of it pound very fine, using a grinding action with the pestle, then wash out the gold in a batea, or horn spoon, and you will find that a large proportion of the gold will float away, in spite of every care, even using ammonia to destroy the grease on the ends of the fingers.

Then take the other half, pound it very coarsely, and in washing out the gold you will see very little float, and two or three turns of the batea will bring all the gold into the center.

In the Blanket System,

Where improved concentrators are used, after the pulp has passed over the blankets, only two lengths of trays of about four ft. each, and two sets to each five stamps, are required. They should be so arranged that the inclination can be altered, say from 3° to 5°, to suit the stuff being treated.

The trays should be about 16 inches wide, and the fall from the battery box to the head tray the same as from one tray to another, about four inches, with a board placed across the end that the fall of the water or pulp will be so broken as to strike the blanket in the tray below, nearly at right angles. The blankets should be in three-ft. lengths and made of coarse wool with a long nap. The double sets of trays are for the convenience of changing and washing the blankets. The blanket washings can be passed through a simple machine like that described in Phillips' Metallurgy (see page 185), and the tailings from it ground with the coarse concentrations in a Chilean mill.

It is not so much the length of the blankets that separates the gold from the gangue, but the fall, or jump, onto them.

Where the mill has a limited supply of water, and they do not like to go to the expense of a number of concentrators, a coarse concentration may be made with a "Tye Buddle," the plans and directions for the use of which will be found in "Phillips' Metallurgy of Gold and Silver," page 187.

The concentrations from the "Tye" can be passed over the "Frue," one of which would then be sufficient for a large mill, though I am not prepared to say by such means they can work as closely as by using the "Frue" alone.

In case the mill is not situated at a very great altitude, where the frost might interfere with this working,

Amalgamated Plates

In three ft. lengths and two ft. deep, on a fixed frame at an angle of about 3°, to which a slow lateral movement backward and forward of one ft., together with a slight shake, is given, in the same direction with a sprinkling of clean water from a perforated pipe falling on the upper part above where the pulp strikes, might be placed with advantage between the blankets and concentrators.

The Concentrations

Should be sifted through a sieve having 80 holes to the linear inch, and any particles that were not fine enough should be ground in a Chilean mill, the same as described by Mr. Latta, but without using the mercury; and afterwards charged into wooden barrels for amalgamation; but, before charging, the sulphurets should be soaked in water, to free them from all decomposition. I feel confident that larger results will be obtained by thus treating the raw ore than if it was roasted.

The great difference between a wooden surface and a metal one in amalgamation can easily be shown by washing out, say, about one dwt. of Bodie or Grass Valley gold in a batea and then adding, with a dropping bottle, just sufficient mercury for it to amalgamate with, too much or too little will lengthen the result, but if the proper quantity be used by rubbing it with the finger in the center of the bowl it will amalgamate rapidly in less than a minute. Try the same experiment with an iron pan, and you will find how much longer it takes to get the same result. I would strongly recommend any mine adventurer, before erecting any quartz mill, or adopting any particular process, to have some 20 or 30 tons of the rock or vein-stone stamped, and to save, during that operation, a fair sample of the battery pulp from it, which should be carefully concentrated in a batea, or any other utensil used for washing on a small scale. The condition and quantity of the gold, and other ores and minerals, should be tested and examined. The percentage of the sulphurets can also be roughly estimated at the same time and all afterwards compared with the gross results from stamping.

Mr. Edward Booth, the analytical chemist on Sutter street, has kindly furnished me with directions for making a simple test for tellurium, in case telluric gold is suspected to be mixed with the sulphurets. It is as follows:

Test for Tellurium.

"Place in a test tube, or other vessel capable of resisting the action of acids, a small amount of the suspected material, which has been separated as thoroughly as possible from the accompanying gangue. Add enough sulphuric acid to well cover the sample and heat to boiling. If tellurium is present the liquid becomes colored a clear purplish-red."

I have only found, as yet, telluric gold in two mines in Nevada county—one near Grass Valley, and the other, the Murchie mine, near Nevada City.

In my private collection I found a specimen marked "Meadow Lake Ore." I do not recollect who gave it to me, but it contains both gold and telluric gold.

A great deal has been written and said about the

So-called Rebellious Gold Ores

Of the Meadow Lake district, and what the different *process-men* were going to do with them, but I never remember having heard of any careful analysis being made, either of the veinstone or the concentrations. I would therefore respectfully suggest to those who have any samples of the Meadow Lake ores to donate them to the Mining Bureau, as the examination and determination of them would be of the greatest importance to the mining interests of the State. The mines were discovered, I think, in 1862, and in 1865 and 1866 eight quartz mills were erected, a large town built, estimated to contain 5,000 inhabitants. Now the place is quite deserted. See MINING AND SCIENTIFIC PRESS, June 21, 1873.

In the published reports of the Geological Survey, 1864, by Prof. Whitney, no mention is made of the mines or district, so that little could have been known about them at that time.

I can only now add that had I years ago acted upon what I now suggest to others, I would have saved large sums of money for myself and others.

The Pan System.

For instance, what is the difference between the gold and sulphurets in the Mammoth lode, Mono Co., and in the Sierra Buttes lode? Is not the gold in the latter much more difficult to save, and would not the Comstock soda, salt and pan system, if introduced at the Sierra Buttes mine soon close it up like the former? For my own part, I firmly believe that if the same pan system were used in the Victoria district, Australia, all the mines using it would soon cease to pay dividends; and also, if the Idaho mines at Grass Valley, were to try it, that their dividends would soon be reduced one-half.

If the correct number of tons of mercury, soda, salt and "other chemicals," as they are called, that have been sent to the Mono County mills were published I am afraid it would appear to be very large.

It might be argued that the chemicals used in the Bodie mills, were for the extraction of the silver from the ores; in that case it would be exceedingly interesting to ascertain the expense, and see if it did not, as some think, cost $2 in coin for every $1 in silver so obtained.

It is, perhaps, unnecessary for me to say that I am neither directly nor indirectly, interested in any process or patented machinery for extracting the precious metals, nor yet in the sale of any book on the subject, and though I do not wish to be discourteous, nevertheless, I must decline replying or having any public controversy with those who have; as I do not like the idea of favoring such a cheap mode of advertisement. For the same reason, should my health, or other circumstances admit of resuming my old profession, I should cease to write any more papers on the subject for publication.

The following is a

Catalogue of the Specimens

Which I shall place in the State Mining Bureau to illustrate this paper:

No. 1—Crystal of pyrite on a glass slide. Some of the faces are very finely and beautifully gilded—so fine indeed that it requires an inch objective to see it to advantage. From the Eureka mine, Grass Valley.
Nos. 2, 3 and 4—Gold, in little drops or specks, imbedded in the pyrites. From El Dorado county.
No. 5—A specimen of arsenical pyrites with gold. From a mine near Nevada City.
Nos. 6 and 7—Sections cut from the same, in which the gold is easily recognized.
Nos. 8 and 9—Gold, with telluric gold
No. 10—Section cut from same.
No. 11—Gold in carbonate of lime. Eureka mine, Grass Valley.
No. 12—Gold in talcose slate. Taquarilla mine, Brazil.
No. 13—Gold in talc. Placerville.
No. 14—Gold on talc. Brazil.
Nos. 15 and 16—Gold in Itacolinga (micaceous iron). Gongo Soco mine, Brazil. The Itacolinga veins are from a few inches to many feet in width.
Nos. 17 and 18—St. John del Rey veinstone; 18 is about the average of what was milled in 1866.
No. 19—Specimen of kidlas from St. John del Rey mine—a rock which forms the sides of the lode, but also contains considerable pyrites
Nos. 20, 21 and 22—Sections cut from St. John del Rey veinstone for microscopic examination.
Nos. 23 and 24—Sections cut from the kidlas.
No. 25—Yellow, dusty matter, mixed with gold, taken out of one of the richest pockets ever found at Grass Valley.
No. 26—Veinstone with gold. Bodie district.
No. 27—Gold in country rock (diorite). From Nicaragua.
No. 28—Gold in quartz crystal.
No. 29—Gold in syenite.
No. 30—Section cut from No. 29.

I have cut a great number of sections from the St. John del Rey veinstone but could not detect the gold in any of them, and unless very great care is taken the batea test will hardly show any gold, notwithstanding which, on a large scale, they obtain better results from the amalgamation of the raw sulphurets than any other process I have seen tried.

I have just received a copy of the report of the Port Phillip company, Australia, published Jan. 13, 1881, by which it appears the

Tribute System

Has been introduced there with great success. Too much can hardly be said in favor of such a system, as it places the hard working and intelligent miner on a much more respectable and independent footing, and though he, in a measure, shares the risks, but only so far as his judgment guides him, he gets the benefit of any discovery he may make; it also encourages him to study the peculiarities of the lode and enclosing rocks, besides, which, by that system, all are jointly interested in the welfare of the mine. Many of the mines now idle in this State could be worked profitably under the system, particularly in the Bodie district.

In the Port Phillip report it says:

"The number of tributes has averaged about 200 during the year, which shows no decrease when compared with the preceding year.

"The tribute system has been further extended by an arrangement with the tributers to drive the levels in the ground let to them, the company assisting them with driving timber and rails, and making an allowance per fathom until the yield reaches 6 dwt. per ton, when no further assistance is given; the company receiving half the gold obtained and deducting from the allowance the cost of tramming; by this means a large amount of driving is done at a comparatively small cost."

The number of tons of quartz stamped on tributers' account for the year was 48,184 tons. The average yield of the entire quantity raised was 5 dwt., 5½ grains per ton (say $5).

Total Receipts	£32,364 14s 7d
Expenditure	26,310 10s 7d
Leaving a profit of	£ 6,054 4s 0d

In conclusion, so thoroughly am I convinced of the great benefits that would result to this State by a more general introduction of the tribute system in an extended form, both to the placer, as well as vein mining, that I wish particularly to call your attention to it, so that, through the influence of the Bureau and PRESS, the subject may be brought in a proper light before the owners of mines or claims. A fair tribute will secure the *muscle* of the working miner, who, in too many cases, understands better than the superintendent (generally a man of business) how to conduct trials for ore, and afterward to develop them. The *muscle* of the skilled miner is in every respect better than foreign capital.

There is no need of the hard-working miner to leave this healthy climate in search of employment, if those who own mines that are now idle, would let the fact be known through the press, and at the same time offer a fair tribute for working them.

"Driven Wells."

A New Mode of Reaching the Earth's Hidden Waters.

The San Francisco *Morning Call* of Oct. 21st contained the following suggestive article:

Cheap water of a good quality is just now attracting so much attention in this State, where irrigation is a vital necessity, and in San Francisco especially, where rates are high and the water bad, that anything new connected with well-sinking, is looked upon with interest. Therefore the announcement that George Babcock would exhibit Green's patent driven-well combination at Shell Mound Park, attracted to that locality a number of capitalists and prominent agriculturists yesterday afternoon. The engine and pumping machinery were placed in the field to the right of the railway track. Of late years, more especially within the last three years, artesian, or, more properly, bored wells, have been drawing much attention. There has been one plausible argument advanced, however, by its enemies, that contaminated surface water flowed down between the casing and pipe and rendered the wells impure. The claim of the inventor of the driven well is, that that well is free from surface water. The mode of sinking it is as follows: An inch and a half hole having been drilled into the ground to a depth of six or ten ft., an inch and a half iron gas-pipe is driven down, in sections, by strokes from a heavy maul. By this means, a depth of 100 to 150 ft. may be attained. The lower end of the lower section of pipe is perforated. A smaller pipe, but three-quarters of an inch in diameter, to the end of which a drill is attached and above which are perforations, is then forced down into the pipe, and water forced down by a hand force-pump. Turning the inner pipe then loosens the inner core of earth, which is puddled by means of the water forced down the inner pipe and forced out of the larger or outer pipe in the shape of thin mud. By this means the inch and a half pipe is cleared. It is then withdrawn by means of jackscrews, and replaced by a similar pipe, the lower section of which is provided with a point, above which is two ft. length of perforations protected by a brass sieve. The pipe is then driven down to remain. The aim, according to the explanation of Mr. Babcock, is to sink the well until an "upflow" of water is struck, which is to be found generally in a stratum of gravel. The "upflow" stream is always free from surface water. Then the pipe being tightly enclosed, tamped as it were by the surrounding earth, is sealed to all practical purposes. At the bottom of the well, in a short time, all the loamy material is drawn into the pipe and expelled, leaving a "well" of gravel. This well is said to average 10 ft. in diameter. The well being airtight, atmospheric pressure is not to be contended with, but is rather an aid, for by its pressure upon the earth and exterior of the well and water in the bottom of the well, it tends to force up the water, so that when, as in an ordinary well, a pump-rod can be but about 27 ft., in this style of well five to ten ft. may be added. The mode of driving the well is not the only point covered by the patent. The inventor has originated a method of combining a number of one-and-a-half-inch wells into one, all acted upon through the main pipe. Thus, at Shell Mound, ten wells have been sunk in a line, each ten ft. distant from the other longitudinally, and 12 ft. distant laterally. The well beds are supposed to widen out to meet the cylinder, or circumference, of the next well, so that each will have about ten ft. diameter, or in all something like a 50-ft in diameter well. When the pump was started up, the four-inch main, into which each individual pipe led, discharged a full head of water with considerable force. These wells, as it appears from the circular, have been in use a dozen years or more in the East, but not in the combination form. Over 500,000 are in use in the Eastern States. A number are in use in the southern portion of this State, but surreptitiously. It is said that these wells may be sunk and supplied with a hand-pump for $1 the foot sunk. The wells at Shell Mound vary in depth from 30 to 50 ft.—the average being about 35 ft. They are worked by a powerful steam pump.

Tombstone District.

The Mines and Prospects.

[By our Special Correspondent.]

EDS. PRESS:—Leaving Silver district, we took a sailbost down the river. For fear the wind might fail, a Yuma Indian acted as engine. Fifteen miles above Yuma we land and make a slight trip of a mile from the river, to examine and take drawings of hieroglyphic rocks on the California bank of the Colorado. The same kind of rude figures exist on the granite rocks near Woodfords, Carson canyon, and nine miles southwest of the town of Healdsburg, Sonoma county. The figures found at the above places were evidently made by the same Indians.

At Yuma we resumed our journey, passed Casa Grande where we waited two hours, on account of a runaway freight train having the track. We viewed the huge adobe structure known as Casa Grande in the gloom of the night and early dawn, but as so much has been written of this ancient building we desist.

The Silver Bearing Belt at Tombstone.

The silver bearing belt embraces an area of about six miles east and west, by about three miles north and south. The Mule mountains are on the south, the Dragoon, on the north and northeast, the Whetstone on the west, and the Huachuca mountains on the southwest. The country rock is porphyry, quartzite, lime and granite. The ores carbonates, chlorides, sulphurets, with much white and green horn silver.

As depth is attained the lime gives out, and porpbyry and quartzite become the predominating rock. The ores are worked successfully by simple mill and pan process, 9% and upwards being the result. The deposit presents all the appearance of being an infiltrated sea or blanket lode, and this opinion is still further strengthened by visiting all the shafts sunk on the district, where larger or smaller deposits are found, after attaining a certain depth.

The lode is a blanket vein—fissure veins being the exception, if they exist at all. [The output of the mines may be found in the tabulated statement which we print on page 398.—EDS. PRESS.]

The Girard Mining Co. is at present building a fine 20-stamp mill, on their own ground, just above the hoisting shaft. It has pans, settlers and all modern improvements. Water from the Sulphuret will be used, so we were informed.

Fourteen of the principal mines have hoisting works, and good machinery.

The Tombstone Mining Co.

Is one of the leading mines. The ore is found in spar and silicate of lime; runs from $50 to $100 per ton. The company has two mills—one 10 stamp, the other 20 stamp—on the San Pedro, 10 miles away, where the ore is hauled in wagons. This mine has paid dividends from the start. Its ore body extends under the town of Tombstone.

The Grand Central

Was incorporated under the laws of Ohio, with a capital of $40,000,000. They have a vein, from 10 to 12 ft. wide, that runs from $50 to $100 per ton. The main shaft, over which is built the finest hoisting works in Arizona, has a depth of over 500. The company has a mill of 30 stamps located at Contention City, about 11 miles from the mine. [When this article appears, the A. T. & S. F. railroad will have been completed to that point.] The grounds of the Western, now the Contention Con. Mining Co., comprises the Contention, Flora Morrison, Sulphuret—the company's lands.

Head Center.

This company's lands adjoin the Contention, in fact a suit in regard to certain rights is now pending between the Contention and Head Center. The Head Center is incorporated under the laws of California, with a capital of $10,000,000 in 200,000 shares.

The ore vein has a width of from four ft. to eight ft., working about the same as those mentioned above. About 45% of the bullion is gold. We saw at the office of the company specimens of porphyry flecked with particles of gold, spangling the rock most beautifully. Some extraordinary rich ore has been taken from this mine very near the surface.

The company has a 10-stamp mill on the San Pedro, near Contention City. The main shaft is down 600 ft. Hoisting machinery of the best stands over the shaft.

The Girard.

In the same locality, has a shaft over 400 ft., with a vein of ore of five or six ft. in width, which mills about the same as the mines mentioned above ($50 to $100). There is said to be a large body of ore in this mine, but we did not enter the mine, nor one along the belt of paying mines. We have visited the locality twice, and on both occasions a personal examination was denied. A fine mill is now in course of construction. This company is incorporated under the laws of New Jersey, with a capital of $2,000,000, in 200,000 shares.

The Vizina,

Incorporated under the laws of New York, capital $5,000,000, in 50,000 shares, has three shafts, the deepest being 400 ft. The hoisting works, which are good ones, with light machinery, stand within the town, and the principal ore body extends north, underlying the town.

The Empire,

Also on the same belt of mines, incorporated under the laws of Massachusetts, has a shaft down 450 ft., with good ore, so it is said. We did not examine it.

The Bob Ingersoll

Lies to the west of all the above mines, some 2,000 ft. The shaft is down 250 ft.; has a horse and whim. They have 2,000 or 3,000 tons of ore on the dump, and contemplate building a mill soon. Ore is being taken continuously from the mine, but none is being worked. That which has been worked at the Boston mill went $100 per ton—picked ore. The ores are chlorides and carbonates.

All the country lying between the Ingersoll and the Contention and Toughnut mines is supposed to contain ore. There are many prospect holes scattered over the locality, being now simply worked for assessments, and no great depth has been attained. West of the Ingersoll, about one mile, the Stonewall has some fine ores, the gangue being manganese (black oxide). The property was lately purchased by the Boston Mill Co., the consideration of sale being $100,000.

Grand Central South

Has a shaft down 250 ft., and a large body of ore, so said. Is a San Francisco company.

Tranquility

Joins the Girard on the west; has large, expensive hoisting works, and some ore.

The Lucky Cuss

Has produced some of the richest ore yet found in the district. Has a shaft 300 ft., with drifts of 500 ft., not working at present.

The Wedge

Shaft 100 ft.; vein three ft., with rich gold ore.

Gilded Age

Covers a large part of the town site. Shaft down 100 ft.

Mountain Maid

Underlies the town site. There are many other lodes of lesser note, as the Owl's Nest, Junietta, Silver Bell, Monitor, Merrimac, True Blue, Lucknow, Delhi, Miami, Franklin, Randolph, Red Top, Argenta and others. Some ore has been produced from all of them, which works about $50 to $60 per ton.

We visited all the following mines: The

Emerald

Has several hundred tons on the dump; width of lode 3 ft., shaft 100 ft. Horn Silver is abundant in the green carbonate ores of this mine.

Riley.

Shaft 60 ft.; 40 or 50 tons of ore on the dump; ore looks well, chlorides and carbonates of copper and lead.

Verde

Has shaft 106 ft., small amount of ore on the dump. Ore was found from the grass roots down.

Little Pedro

Is on the same line as the Emerald, about one-half mile south. Ore found on the surface in a precipitous limestone bluff. Found in small veins, patches and bunches with small veins of four inches to a foot or more, is a good indication of what may be found below. There are several shafts of slight depths on the ground.

Big Pedro

About the same as the above, on the same hill.

Bonanza.

Shaft 75 ft., some ore which assays from $50 to $150 per ton.

Anchor Mine.

This company has an inclined shaft 180 ft. deep following the ore from the surface. A tunnel has been run intersecting the bottom of the shaft where a body of ore of some extent now exists, and is being taken out and piled on the dump. The ledge material is 7 or 8 ft. in width, with smooth line foot wall but no banging as yet. The ore is mixed with black oxide of manganese the same as the Stonewall, on the line of which the lode is located. The mine is a promising one, and a large amount of ore can now be taken from the mine; there are several hundred tons on the dump.

The company is a Chippewa Falls, Wisconsin, one. The officers are, L. C. Stanley, Pres.; S. B. Strong, Vice; L. M. Newman, Sec.; V. W. Bayless, Treas.; Supt., A. H. Bayless.

Prompter.

This company are grading to put up steam hoisting works. The main shaft is down 200 ft. with other shafts of various depths. Ore seems to be abundant in this mine near the surface. The mine is on the same lode as the Stonewall, which we think it joins. The ore body in the shaft is from 15 ft. to 25 ft. The above is an Arizona incorporation, President, Col. A. Lewis.

Obligations.

We are under many obligations, both on the present visit and the previous one, for many fine specimens from the various Tombstone mines, to Mr. F. A. Hunter, assayer, Tombstone. Mr. Hunter designs visiting Sonora in a short time. He has visited that locality before and gives glowing accounts of its wealth.

G. M.

TEST FOR NITROUS ACID.—Griess' test for nitrous acid in water is so delicate as to detect one part in 1,000,000,000 of water. The water is acidified, and some sulphanilic acid with some hydrochlorate of naphthylamine added. If nitrous acid is present, a rose-red tint is developed.

Mining Districts of Arizona.

We have prepared the following brief notes concerning various mining districts in Arizona, which will be found of interest.

California District

Is 20 miles south of the Southern Pacific railroad, in the Chiricshua mountains, in a well wooded and watered country. The ores are smelting, carrying much born silver. The veins are large and well defined. The principal mines are the Texas, Continental, Cashier and others.

Turquoise District,

Located at the southern end of the Dragoon mountains, 20 miles from Tombstone, the ores are carbonates and chlorides—smelting ores. There is wood and water to a limited extent. The ores assay from $25 upward. The mines are mostly owned by New York parties. The Defiance, Tom Scott, Star, Bodie, Mono are the principal mines.

Doe Cabezas,

In the Chiricahua mountains near the railroad. The ores in this district are mostly gold-bearing with large deposits of ore. The principal mines are the Jupiter, Silver Cave, Galena Chief, Bear Cave, Greenhorn and others.

Hartford District,

On the southern end of the Huachuca mountains, the ores are heavily charged with copper, and run from $10 to $100 in silver. Wood and water is abundant. Most of the lumber for Tombstone comes from this section, and the Huachuca water company are now laying pipes and constructing a large reservoir on the high hill back of the Contention, at Tombstone, the water to be brought from the above mountains. When this important work shall have been completed, and the mills removed to Tombstone, the low grade ores can be worked at a profit, and the production of bullion largely augmented.

Harshaw District

Is some 70 miles southeast of Tucson, in the Patagonia mountains, which mountains are covered with oak and juniper. The ores are chlorides. The Hermosa is the principal mine. The company have a fine mill at Harshaw, and a vein of ore from 8 to 12 ft. wide. Something like one million has been taken from this mine. The Trench, Hardshell and Blue Nose are other mines with the Alta on which extensive workings have been made.

Washington District

South of the Harshaw a few miles, and near the Santa Cruz river, is in the midst of a heavily timbered region on the southern end of the Patagonia mountains. The ores are argentiferous galena, the percentage of lead being great. The ores are generally of low grade but large deposits. The Davis is one of the carbonate lodes which has in some places a width of over 20 ft. The Belmont and San Antonio are the oldest locations, and but two or three miles from the Sonora line.

The Holland, Washington, or Washington Pool mines, embrace 8 or 10 mines.

The geologist, Palfery, years ago wrote up, and remained some three years, in this section attempting to work a mine, but was driven out by the Apaches. The 'Old Mowry Mine," four miles from Washington Camp, was worked by Lieut. Mowry before the civil war, and gave employment to 400 Mexicans. Large smelting works were erected, but the chimney alone remains to mark the site of the smelter, the Apaches having burned down and destroyed the works. The old shaft was down 350 ft. The ore of this mine carries 40 to 60 per cent lead.

Tyndal District,

To the southward of the high peaks of the Santa Rita mountains, some 60 miles from Tucson. The mines are near the Santa Cruz, with wood and water. There are many mines in this district, but no great showing has as yet been made, but as wood, water and ore are abundant, we see no good reason why, in the future, this should not become a prosperous district.

Oro Blanco.

The ores of this section are mostly carbonates. The Yellow Jacket has a 10-stamp mill. The Warsaw has also a 10-stamp mill and roaster. Ore from this mine has worked $80 per ton. Some $30,000 or $40,000 have been extracted. The Warsaw vein is four ft. wide; carbonate ores.

Other mines are: The Alaska, Peelstick Montana, which is a large lode or deposit of carbonates; Idaho—ore from this mine assays as high as $200; Susan, California, and others.

Empire District

Is seven miles from the Southern Pacific railroad, and midway between Tucson and Benson. The Total Wreck is the principal mine, and the one that has of late brought the district into notice. It is an immense body of chloride ores, of 50 ft. in width; the ore also carries gold; is supposed to be a contact vein, between porphyry and lime. The formation is about the same as Tombstone.

Old Hat District,

On the Santa Catarina mountains, near the north end, is a few miles from Benson. Wood and water plenty. Has some promising lodes which assay from $50 to $200 per ton.

Santa Rita.

The above mountain, besides its lodes of gold and silver ores, has immense lodes or deposits of copper ores, carbonates, copper glance and the rich red oxides. Hundreds of acres are covered by the croppings. And the copper deposits of the Silver Bell district, some 50 miles west of Tucson, are among the largest found in the Territory. Expeditions to the not distant Mexican State of Sonora return and give glowing accounts of the mineral wealth of Sonora, exhibiting exactly the same character of ores found in this and other districts in Arizona. The dream of wealth always lies beyond the distant blue mountains, and the restless miner passes in disdain over districts of immense wealth, across the line of his own country, over the cactus-clad hills, in search of the phantom wealth which still lures him on over range after range of mountains and parched plains, only to return to the fields of his former labors a "busted" but wiser man.

Pioneer District

Has been made famous by the discoveries of the Silver King. The vein crops on the summit of a low hill, in a basin surrounded by mountains. During the Apache war a soldier discovered the mine, so said. The ore is a sulphuret, carrying large quantities of native silver. The company has in its office at the mine some magnificent specimens of native silver as taken from the mine. In places the ore body is near 100 ft. wide. Five miles from the mine, at Pinal, is the mill of the company. The ore is worked by the lixiviation process with success.

The North and South King are extensions. Eastland and Last Chance, Mount View and Alice Bell are mines of the vicinity.

The Belcher, with a 10-stamp mill, the Eureka, Surprise, Gem, Lewis are mines of importance and rich prospects.

The Silver Queen, the first location in the district, is a promising mine, owned by Californians.

Mineral Hill.

Mines and rumors of rich mines in the above district are constant. The district is a granite one; the ores smelting; veins large and rich in carbonates and galena. They also carry gold. The Gila river runs through the district, and wood is plenty.

Quarjata.

This district lies six miles south of Casa Grande, where are some very rich chloride and horn silver ore from mines lately discovered in this section. Wood is plenty but water scarce, but can be had in quantity by sinking in the dry bed of the Santa Cruz river, which is supposed to flow into the Gila beneath the desert sands.

Globe District.

There are many promising mines in this district. The rock formation of the country is granite, both true, and syenitic porphyry and quartzite, limestone and slate. Wood is comparatively plenty for years to come. The principal mines are Irene, Alice, the former a New York company, the latter the property of the Globe M. Co., Centennial, Stonewall, California, Miami, Golden Eagle, Centralia, Independence and many others. The ores are generally free milling, with some copper. Much of the ore was formerly shipped to San Francisco for reduction. It may be said to be a promising district.

Richmond Basin,

Fourteen miles north of Globe on the west slope of the Apache mountains, has wood and water in abundance. This section is famous for its large nuggets of pure silver. Something like $80,000 of the metal is said to have been picked up. The ore found here is native, silver glance, and bromide. The McMorris is the leading mine, has a vein eight ft. wide, the main shaft is down 450 ft., with inclines and tunnel of 800 ft. more. Something like $400,000 has been extracted from the mine. The company have steam hoisting works and a ten-stamp mill. There are other promising mines here. There are also rich mines at McMillenville, about 20 miles north of Globe, on the line of what is believed to be an immense fissure in the granite, as it is traceable over the mountains for a great distance. Wood and water abundant. The Stonewall has produced some native silver—has steam hoisting works. The main shaft is down 600 ft. and there are 1,000 ft. of drifts. A five-stamp mill is one of the fixtures. Copper is also found all over the mineral region of Gila county.

Prescott Mining Districts.

The various districts around Prescott and in Yavapai county, which are known to be rich in minerals, will soon be placed within easy communication with the outside world, by the completion of the Atlantic & Pacific railroad. By this road, a vast extent of country will be developed and the mineral wealth of her mountains opened to capital-seeking investment.

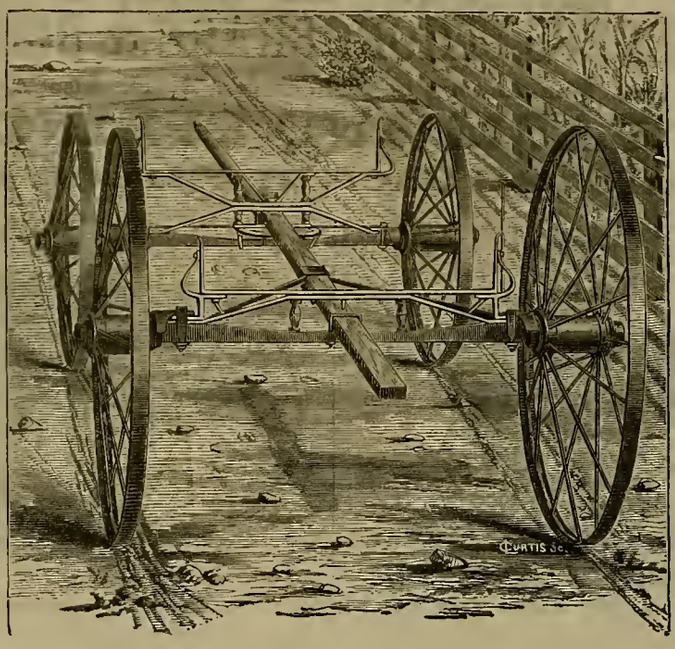
The districts of Hassayampa, Walker, Tiptop, Big Bug, Groom Creek, Cherry Creek, Martinez, Weaver, Black Canyon and others will be given a new impetus, and the large amounts of low-grade silver and gold worked successfully. Its great distance from the South Pacific railroad has worked somewhat against the county, but in the near future the mines of the above districts will be heard from.

On the San Francisco river, rich gravel deposits exist, and salt exists along the river of that name in immense deposits in the bluffs, and salt lagoons are found along the line of New Mexico in Apache county. Coal is also found along the Little Colorado river, which extend into New Mexico and Utah. They are said to be extensive deposits.

AN attempt was made to burn the Day furnace, at Bristol, Nev., recently.

THE SWEEPSTAKE IRON WAGON.

Important Advantages Over Wooden Wagons



Which we think we can justly claim for it:

1st. The material of which it is made is equally unaffected by the hot, dry climate of our interior valleys, or the cool, wet weather of the coast.

Experience has shown that it is almost impossible to make wooden wagons stand in valleys like the San Joaquin, the heat of the sun and the drying winds seeming to destroy the life of the timber, causing them to fall to pieces.

In this respect we feel confident that this wagon is just what has been long needed.

2d. The tires will never require setting, but will simply have to be renewed when worn out, as the wheel can never become "shackly," nor can the spokes get loose in the hub. This alone is many men would make the wagon of twice the value of a wooden one.

3d. The entire Wagon will last (if the tires are renewed) till the spindles are wornout, and the repairs on it will be next to nothing.

For the above reasons we claim that we are offering to the public the best farm or freight wagon yet made.

They have been severely tested in every possible way, and the result has fully justified all we have ever claimed for them as to

STRENGTH, DURABILITY,

Lightness and Ease of Draft.

They have been used steadily in hot, dry climates for months, and in sections where it rained almost constantly, and in both cases remained in perfect order.

A good many of our wagons were sold last year with the understanding that the purchasers were to test them severely, and they did so, with one unvarying result—proving in each case that they would carry a heavier load and pull lighter than a wooden wagon of the same weight. We are now making these wagons in quantities and have had rolls made at the rolling mills specially for us to make the forms of iron that we require to best secure lightness and strength. For this reason OUR WAGONS FOR THE PRESENT SEASON will be superior to any heretofore made.

We wish to reiterate what we have said before about these wagons being constructed on an entirely new principle as applied to wagons, for it is the chief reasonfor their success.

Iron wagons have been attempted before and have not been successful, but the difference between those made heretofore and ours is as great as the difference between iron and wooden wagons. All iron wagons made hitherto have had a clumsy and heavy appearance, due to the fact that the makers thereof attempted to use the iron just as wood is used—that is, instead of employing the truss principle they attempt to get strength by using large heavy pieces that are subjected to a breaking strain precisely as in a wooden wagon. It is needless to say that the plan resulted in a failure from the fact that when iron of sufficient size was used to obtain the required strength, the wagon became much heavier than a wooden wagon, rendering it useless.

THE BEST FARM AND FREIGHT WAGON IN THE WORLD. LIGHT, STRONG, HANDSOME AND DURABLE.

(Patented March 25th, 1879, and July 1st, 1879.)

THIS WAGON IS CONSTRUCTED ON THE TRUSS PRINCIPLE THROUGHOUT, WHEELS, AXLES, BOLSTERS, AND ALL.

The Cut Shows the Construction of the Wheel,

And special attention is called thereto, as the wheel is the weak point in all other wagons.

A moment's consideration will show that neither a side strain nor a heavy load can affect it unless some of the spokes shall stretch or pull apart, a result that cannot occur with any load that the spindles will sustain.

It will be seen that the load on the axles is carried by the upper spokes of the wheel—in other words, it hangs on them, and were all the spokes in the lower part of the wheel removed, the load would still be sustained.

The bracing position in which the spokes stand—being six inches apart at the base—effectually prevents a side strain affecting it; such a thing as "dishing" being simply impossible.

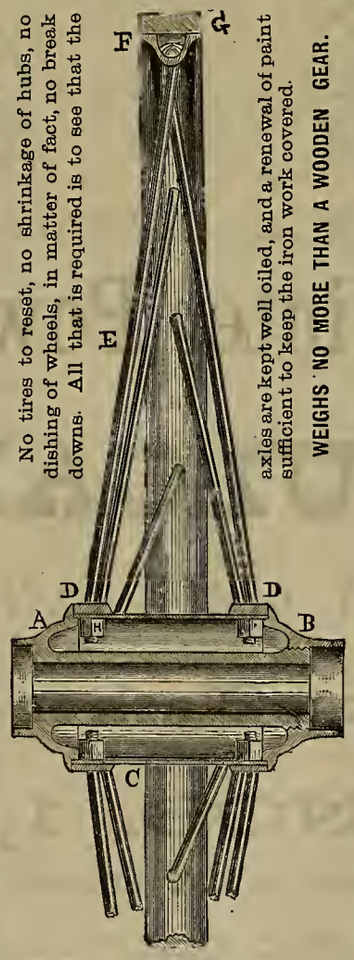
The cut shows the hub of a wheel split open lengthwise through the middle. It is one-sixth the full size of a hub for a two-inch axle. At F and G, the felloe and tire are shown as they would look if cut in two. G is the tire and F the felloe. The shape of the felloe and the way the head of the spoke rests into it, can be clearly seen. E is one of the spokes. For this size of wheel we use half inch round Norway iron, with the lower end (where the thread is) upset so that it is as strong there as anywhere else. We use close fitting, hot pressed nuts, nearly seven-eighths of an inch thick for a half inch spoke.

A represents the box of the hub, and also forms one end of it. B is a cap or flange that screws on the outer end of the box and forms the other end of the hub.

It will be seen that the two flanges, A and B, screw up close to the nuts on the spokes, thus locking them and preventing them from turning or getting loose.

At the same time the box, A, and the flange, B, are independent of the rest of the wheel, so that if a box should become worn, it can be replaced in 10 minutes by the teamster without resorting to a blacksmith or wagon shop. They are all made to gauge, so that any box will fit any wheel hub made for the same size of spindle. C represents the shell of the hub. It is made of wrought iron pipe, and is surrounded at each end by wrought iron bands, D, D, shrunk on. The spokes pass through these bands as shown.

The felloe is a solid ring of *wrought* iron, of the shape shown at F. Take particular notice that it is *wrought iron*—not *cast*, as many are lead to suppose from its shape. This is a wrought metal wagon. Cast iron is used only for the axle boxes and the sleeve through which the reach runs. The tire of the wheel is shrunk on in the usual manner and riveted. The wheel, when complete, weighs no more than a wooden one for the same sized axle and is not less than four times as strong. We think that men who understand the amazing strength of a wrought iron truss will agree with us, after examining the foregoing cut, that this wheel is the most durable, strong and perfect wagon wheel that can be made in the present state of the mechanic arts. There are two parts of this wheel that will wear out, and two *only*. These are the tire and the box, either of which can be easily replaced. *The rest of the wheel will last a life-time.* As it can neither shrink in dry weather nor swell in wet, the tire will never get loose and will never require resetting, but will simply have to be renewed when worn out. This immense advantage alone is sufficient to justify our assertion that we are making the most perfect wagon known, but there are also advantages connected with the construction of the gearing that are almost as great as those of the wheel.


G
F
E
D
D
A
B
C
No tires to reset, no shrinkage of hubs, no dishing of wheels, in matter of fact, no breakdowns. All that is required is to see that the axles are kept well oiled, and a renewal of paint sufficient to keep the iron work covered.
WEIGHS NO MORE THAN A WOODEN GEAR.

FULLY WARRANTED.

This Wagon is found upon trial to run more easily than a wooden one, owing perhaps to its great rigidity, preserving the wheels in a position perpendicular to the axles.

We discovered when we first made this Wagon that it moved with great freedom and ease under a load, and the teamsters using it declared that it ran easier than a wooden one, but we could hardly account for it, except on the theory before mentioned; but one of our customers, Mr. R. S. CLAY, of Merced, explains the matter in a manner that makes it clear. He says that it is because the wheels have neither "dish" nor "gather," but stand plumb and true, and as he expresses it, "makes a square track in the dust," while a wheel having "dish" and "gather," makes a kind of plowing movement. "Gather" is a technical term used by wagon makers to denote a peculiar way of setting the axles by bending their ends a little forward, so that the distance between the front part of a pair of wheels is less than that between the hind part.

It is given wheels to make them crowd the shoulder of the spindle instead of the nut, and if given scientifically and in just the right degree is beneficial perhaps; but if carried beyond a certain point—as it often is—it adds *very much* to the draft of the wagon.

To illustrate this idea, let us suppose the "gather" to be so great that the front part of a pair of hind wheels is close up to the bed while the hind part stands off a foot. It will be seen at once that the result would be that the Wagon could hardly be moved at all with a heavy load.

Again, it adds greatly to the draft of the Wagon if it has either too much or too little "set." If too much, the wheels stand under too far; and if too little, they straddle apart too much, in either case creating undue friction on the axles and wearing out the boxes rapidly.

The easiest running vehicle in the world is one whose wheels stand perpendicular, whether loaded or empty, and in an exact line fore and aft, like those of a locomotive, and that is just the way the wheels stand on our Iron Wagon.

Before the axle can yield, except at the shoulders, it must pull apart—a manifest impossibility—and before the bolster can give out, it also must pull apart the bar forming the upper cord of the truss. Herein is the secret of the success of *these* Wagons, while *other* iron wagons have failed. When wrought iron is used, so that it is subjected to a bending strain, it has very little strength comparatively speaking, but when it is so used that the strain comes endwise it can hardly be pulled apart. We have carried some tremendous loads on these Wagons, but do not claim for them that they will stand much more dead weight than any other iron axle wagon—though they will some, because the axle is so made that the strain or weight of the load comes close up to the shoulder; but we do claim that the wheels and gearing are strong enough to carry *double* the weight that they are recommended for.

A two-inch wagon in use by J. L. Kirkham, at San Leandro, has repeatedly, during the past two years, carried loads of coal and iron, weighing over 7,000 lbs.; and on one occasion he brought from San Francisco to San Leandro, on this same two-inch wagon, *a load of 9,000* lbs., as shown by the Ferry scales. But this is excessive as well as useless and foolish. Many persons have used our two-inch wagons steadily under loads ranging from 6,000 to 7,500 lbs.; but we do not claim any such carrying capacity for them. From 4,000 to 5,500 lbs. is enough on any ordinary road for a two-inch spindle.

IRON HEADER WAGON GEARS.

We manufacture for the harvest season a large number of IRON HEADER WAGON GEARS—1⅝, 1¾ and 2-inch axle, with 3 ft. and 3 ft. 10 inch wheels, tire from 3 to 4 inches wide, and if desired to make Farm Gears of them, can furnish 4 ft. 10 inch wheels. Having made important improvements within the past year, the Wagon, as now manufactured, is perfect in all its parts, and we anticipate an active trade. Orders should be sent in early to insure prompt shipment. Lack of space precludes our giving a more extended description or insertion of numerous testimonials. *SEND FOR CIRCULAR AND PRICE LIST.*

We can supply an EXTRA OUTSIDE TIRE IN SECTIONS, to go over the regular tire, which will save its wear, strengthen the wheel, and can be renewed at any time and at small expense, as compared with welding and resetting; or any person can put it on without the aid of a blacksmith.

We have encouraging and very satisfactory reports from all who have used the wagon, and strong testimonials from some of the most prominent men and farmers of this coast, among whom we would mention a few: Hon. John Bidwell, of Chico; Benj. R. Crooker and Mike Bryte, of Sacramento; A. Wolf and A. McCloud, of Stockton; R. S. Clay and W. P. Colman, of Merced; J. J. Fulton and Messrs. Germain, Montgomery & Co., of Benson, A. T.; Isaac Perkins, of Modesto, Cal., and many others too numerous to mention. Address,

BENICIA AGRICULTURAL WORKS, Benicia, Cal.

Or BAKER & HAMILTON, San Francisco and Sacramento, or Agents.

A. W. SANBORN & CO.,

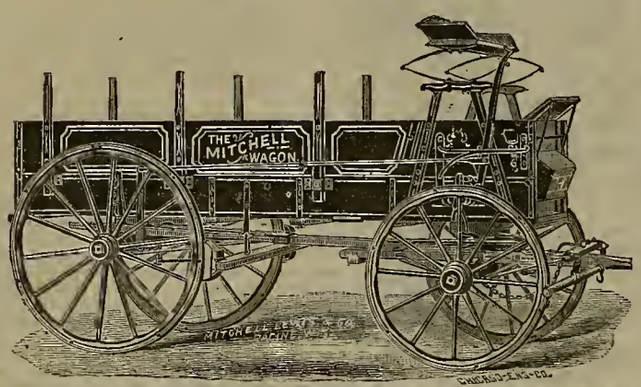
Manufacturers and Dealers in

CARRIAGES, EXPRESS, THOROBRACE & BUSINESS WAGONS,

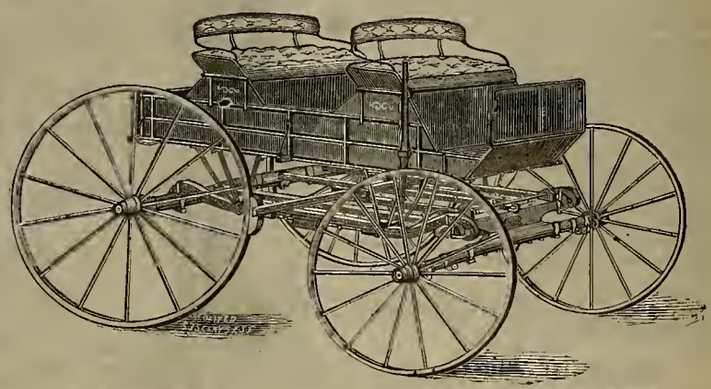
From their own Manufactory in Manchester, N. H. Also Agents for the

MITCHELL FARM AND SPRING WAGONS.

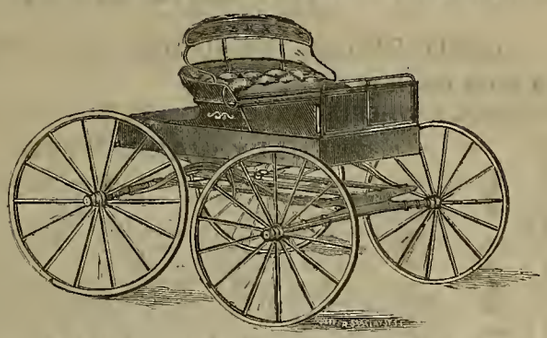
24 and 26 Beale Street, S. F.



MITCHELL FARM WAGON WITH CALIFORNIA STAKE RACK BED.



THOROBRACE WAGON—TWO OR THREE SEATS—THREE SIZES.



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FOUR SPRING WAGON FOR RANCH AND FAMILY USE—THREE SIZES.

Fall and Winter Powder Supply.

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THE BEST LOW GRADE EXPLOSIVE IN THE MARKET.

Superior to Black or Judson Powder.

VULCAN NOS. 1, 2 AND 3.

THE BEST NITRO-GLYCERINE POWDERS MANUFACTURED.

Miners about to purchase their fall and winter stock of explosives, will find it to their interest to patronize the CONSUMERS' COMPANY. We are prepared to offer SPECIAL INDUCEMENTS ON PRICES.

VULCAN B B POWDER (IN KEGS OR CASES) IS UNEQUALED FOR

Bank Blasting and Railroad Work.

CAPS AND FUSE OF ALL GRADES FOR SALE AT BOTTOM RATES.

Send your Orders to

VULCAN POWDER CO., - - - - 218 California St., San Francisco.

New Mexico.

Its Mines and Resources.

The mines and unoccupied lands of New Mexico are just at present attracting the attention of the Eastern capitalist and the outside world in general. Having visited the principal part of the Territory, we give the following brief description of some of its mines and mesa lands: From the time we pass through the tunnel at the Raton Pass, leaving the State of Colorado behind, and emerge into New Mexico, to where we pass out of it over the Membres mountains into Arizona, the country is full of interest and minerals.

On the flanks of the Carrillos, Ortiz and Tuerto mountains, along the slopes of the Gallinas Ladrones, Mogollons and Black Range, evidences of mineral deposits of greater or less extent are met with.

Rich gold-bearing rock is found in the Oscuras, near White Oaks, and chlorides, carbonates, native and horn silver in all the mountain ranges.

On the 25th of Sept. of the present year we left the city of Santa Fe, for a trip to the great mesa beyond the San Pedro mountains, and to view the mines along the Cerrillos and Ortiz chain. Our route for twenty miles lay across the mesa to the south, a gravel plain of little or no value. The rainy season had but just closed and the plain was flecked with the most beautiful flowers. Cactus of many varieties, laden with crimson and yellow fruits, daisies of two or three hues; clusters of petunia, gigantic sunflowers—indeed this appears to be the home of the sunflower. Mesquite bushes, palo verde shrubs, with their limbless branches full of small leaves, clustering closely to the body of the shrub. These extraordinary trees, with their green cork-like bark and sharp thorns, only hold their leaves but for a few weeks during the rainy reason, at other times they appear as dead stalks, gnava, amole or soap plant, the yucca with bayonet-pointed leaves, grama and bunch grass make up the vegetation.

The Santa Fe creek crosses this mesa flowing south, emptying into the Galaesteo creek, which in turn empties into the Rio Grande 30 miles away. These rivers contain no water except in the rainy season.

Bounding the mesa on the south the cone-like peaks of the Cerrillos rose above the plain to a hight of 500 or more ft., covered with a sparse growth of juniper and pinyon pine.

Tangled masses of thorny cactus lined the road, an occasional rude cross, surmounting a pile of stone, marked the spot where some life had ended at the hands of the murderous Apache. A conical hill, crowned by a tall cross, stands on the verge of the mesa, the advance guard of the mountain chain.

One mile from this point we reach the town of Bonanza.

Here reduction works are being built, a smelting furnace of the Duryea plan was in operation.

The Ore Obtained in the Cerrilloe,

Is argentiferous galena, which contains in addition zinc, antimony and iron. The ore is not of high grade.

Two miles further on, near the summit of the chain, we reach the town of Carbonateville. Near this point is located the Aztec Turquoise mine of "Chalchuitl." There we see the evidence of long years of labor in the deep excavations and great dumps of refuse from the mine, now overgrown with large trees, some of which are two feet in diameter. There is no historical date of commencement to mine for the mineral, though it is more than probable that long before the Spaniards conquered and forced the natives to mine for the mineral, the descendants of the Montezumas wore the gem for ornaments.

In 1680 the Indians revolted and threw off the yoke of Spanish authority, drove their task masters from the country and filled up the mines they had been compelled to work. The Turquoise mine was not abandoned until a cave buried 25 of the natives.

A large cross stands on the hill, or what is left of it.

The reopenings of the mine disclose old passages, blackened with smoke. These workings are curiously made; deep shafts showing no marks of drille or powder, yet in rock hard enough to require them.

The stone hammers found in the drifts and workings, show what rude means were employed to mine for the gem. Here are the ladder ways, poles notched for steps, reaching from one rock stage to another, up which the toiling peoned Mexican, or Pueblo Indian, carried the dirt and ore in rawhide sacks on their heads. The Indians, at the present day, regard this mine and the beautiful gem found here with a kind of sacredness.

The Turquoise Jewels

In the crown of Spain are from this mine, which is the only one on the continent of America.

We clambered through the blackened passages, along the drifts to the farther end, where we found the ore in place. It penetrates the country rock—which is porphyry in small seams, the most of the ore being carbonate of copper. The gem is found in reniform or kidney shaped nodules. In reopening the mine some of the remains of the buried Indians were exhumed.

Bits of glazed pottery and fragments of stone hammers are found in the debris of the dumps, to which the Indians of the Pueblo of San Domingo resort and scratch over the ground for bits of the blue gem that may have escaped the workmen.

Several of the Mines

In the vicinity were worked by the Spaniards for silver more than 200 years ago. One, the Mina del Toro, has been worked in step-like courses far below the present level of the water. Notched holes, on which the miners descended, lead down to the water's depths. There is ore in sight above the water line, but to what extent is not discernible.

One is puzzled in viewing this mine, to comprehend how the Indian slave, without powder or drills of any kind, sunk this shaft to the depth we find it.

There are several old mines near this point which have been filled up for some cause.

Leaving the ancient mines, we drove down the dry bed of an arroyo to the town of Cerrillos, a station on the A., T. & S. F. railroad. Crossing the Rio Gallistea, a ride of 12 miles over the foothills brings us to the

Hacienda del Oro,

A stage station on the northeast base of the Ortez mountains.

Here are located the old placers which have been worked for 200 years. There is but little water to mine with, and the dirt has been packed on "burros" for six miles to the water.

Dry washers have been tried at this point without success.

Thirty miles away, the Pecos river flows toward the valley of the Rio Grande, where water is abundant, but it would have to be brought in iron pipes, as the sands of the mesa would absorb the water, and the intervening plain is lower than the placere. It would cost more than $1,000,000 to complete the work. No mining is being done worthy of note.

Nine miles farther south, over hills covered with a dense growth of pinyon pine and juniper, we reach the new placers.

We find at the base of the Tuerto mountains the most extensive deposits of placer gold, and in the mountain, the largest deposit of gold, silver and copper ores to be found in the Territory. Hundreds of shafts and shallow excavations attest the length of time and extent to which they have been worked.

There is no water, and what dirt has been washed, was packed to water, or the water hauled in hogsheads to the mines.

An Iowa company is to make the attempt to obtain water by boring. No work is being done on the placers. In the mountain range, many seemingly rich lodes are being worked.

The San Pedro Co. have the most extensive reduction and smelting works in the Territory located at this point. They consist of a 25-stamp mill and two water jacket smelting furnaces.

An artesian well 400 ft. deep supplies the water. Water is being brought from the Sandia mountains, 17 miles away. Iron pipes are used, but as yet not successfully.

Near by is the little town of Golden, about 100 inhabitants.

In 1843 this town had a population of 5,000, who worked the mines now known as the New Placere. Large nuggets were sometimes found, the largest one, of seven lbs.

The Manner of Washing the Dirt.

At that time, the water was drawn by oxen, one dollar per hogshead being paid for it.

The men who worked the mines, received for their services, three buckets of dirt or gravel as pay per diem. From prospects made at the present time, this would amount to about 15 cents.

When the Mexican war commenced, men were drafted from all parts of Mexico, and the the mines of Golden abandoned.

Without water these mines are worthless. It is only from the quartz lodes and mineral deposits, which exist in the mountains, that recompense may be expected. The title of these lands are in dispute, the government having commenced suit to set aside the Mexican grant title. Although this grant was located for agricultural and grazing purposes, there are

No Lands Fit for Farming

On the entire grant. Grass is abundant, but one spring on the land, from which the short mountain chain takes its name, "Tuerto." Lieut. Col. W. H. Emory visited these mines as early as 1846, and in his notes speaks of them.

From these mines the Aztecs procured the gold for their ornaments, and the sight of the large nuggets seen by the early Spaniards at the City of Mexico prompted them to follow their Indian guides to the placers, and found at the base of yon mountain range, 50 miles to the northward, the infant city of Santa Fe. The mountain sides and the mesa at their base is densely wooded, with pinyon, pitch and contorted pine, with juniper and an occasional mesquete. The country rock is granite, limestone and porphyry, with some sandstone and slate. Fossil shells of the upper and lower silurian, devonian and carboniferone periods, are abundant in the limestones and slates.

The mountain ranges throughout the Territory are capped with limestone or felithian deposits, and the lodes generally are what are known as infiltrated sea or blanket lodes. They are horizontal deposits.

Copper

Is very abundant. There are mountains of it in the Oscuras, Gallienas, Ladrones and Mogollons that will yield from 5% to 75%.

From all over the Territory, carbonates, sulphurets, chlorides, native, brittle, horn, ruby and bromides of silver and rich gold quartz is found.

From the summit of the Tuerto mountain we look out over a wide extended mesa. A dreamy haze gave it the appearance of a vast inland sea stretching away to the south for over 100 miles, beyond which rose some low mountain peaks.

This vast plain is

All Government Land,

No claim, as yet, has been laid on its extensive surface. With the exception of some salt marshes near the center of the plain, where the rain collects in the wet season, no water exists. Artesian wells would make this a desirable property (as it is covered with a luxuriant growth of grass), if owned by a company. One hundred and sixty acres would be useless.

The Rainy Season

Commences about the middle of July and ends the first of September, during which time the mountain ranges are swept by the most terrific storms, cloud bursts being frequent. The dry streams become raging torrents, sunshine and rainstorm alternate. The mesas and mountain ranges are quickly clothed in verdure. Flowers of the most beautiful varieties fleck the hillsides, which but a few weeks before gave no signs of life.

Nothing will grow in New Mexico without water, and when the rainy season closes, the hills soon become brown and the brilliant flowers disappear. In the

Santa Rita and Hanover Districts,

Are mines of virgin copper. We saw sheets one-half inch thick by four or five ft. square, which is obtained from a decomposed trap rock.

We saw copper utensils in Santa Fe, said to have been made by the Indians from copper obtained at these mines 200 years ago.

The United States use 30,000 tons of copper per annum, one-half of which is produced by the mines of Lake Superior. New Mexico alone, in the future years, can more than supply that demand.

The remains of old smelters of adobe and the huge dumps at the mines attest what has been done in the past.

In the Pinos Alto district, we also see the evidences of ancient mining in the old arastras and abandoned placer mines.

Three hundred thousand dollars to the ton (?) is said to have been extracted in these old arastras, but its glory like the $300,000 to the ton, is gone.

The Carrizillio District.

Thirty miles south of the Southern Pacific railroad, joining on old Mexico, contains some promising looking lodes, but little development. The veins are in porphyry and granite, and may be traced for miles.

There are many springs of water in the mountains among these lodes, and wood abundant.

New Mexico is yet in its infancy; there are less than 100 stamps in the Territory, one-half of which are crushing. There are seven furnaces, one-half of which are smelting. As we wander over the mountain ranges viewing the signs of hidden wealth, the advancement she has made in the past year, and behold the evidences of the rude mining, drudgery and servitude of 1680, of those who broke rocks with rude stone hammers—unwieldly and awkward—wooden wedges and levers, contrasted with 1881, where we see mines opened on the site of old ones, hear the ring of the hammer and drill, the deep boom of the blast of American enterprise, we cannot believe but it will be prosperous.

We crawl through the windings of these old mines, and listen to the narration of scenes and incidents, or stroll through the pueblo villages along the Rio Grande, where as at Taos, we find the fires burning brightly, on the altare of the descendants of the Montezumas.

The Gunnison Country.—Denver *Tribune:* Heavy snow falls have been frequent of late in the Gunnison and San Juan mining camp. Accounts received yesterday from Ouray county say the snow is from three to five feet deep on the level, and much the same state of things exists in the Gunnison. All prospecting has ceased for the winter of course, and the work of developing the established mines is in many cases suspended. A few, which are well prepared for the siege, will be operated all winter, but it is not probable that any ore will be shipped out to market. Considerable development work has been done in both sections during the past summer, which will be a great value in the general operations of next year. Prospectors have discovered several new mineral belts, which give promise of good returns when methodically opened. It is now more than ever believed that one, and perhaps two, extensive tracts containing lead carbonate ores have been opened. Being on the reservation no great amount of work has been done on them; still sufficient is known to create strong confidence in their ultimate value. Though the bullion yields of the Gunnison this year are light, probably not over $200,000, it is a clear gain of that amount to the State. We may count on a considerable increase from that quarter in 1882.

Resigned.—The Nevada City *Herald* says: R. McMurry, for many years Superintendent for the Eureka Lake Co., has tendered his resignation. Who Mr. McMurry's successor will be is not yet known, but it is safe to predict that it will indeed be a hard matter to find one in every way so competent for the position as Mr. McMurry is. Mr. McMurry has also resigned as Supt. of the Yuba Canal Co. Con.

The Ditch System.

The Nevada *Transcript* says: The ditch lines of the mountains are owned by various hydraulic mining companies, that in some instances find a market for the surplus water they do not need for their own use. Quartz, and drift mines and ranchers buy of them, and the receipts from this source pay a portion of the cost of keeping up the property. We have in mind one company that thus disposes of a larger per centage of its water than any other, reserving only about half for its own use. It pays out an average of $40,000 a year for labor and material in maintaining its canals, flumes and dams and other appurtenances. It realizes only half that amount from sales, but by using the balance of the water in its own mines is able to make a fair profit. If, to-morrow, the company should be compelled to suspend hydraulicing it could no longer afford to keep the water running, as the receipts from sales would be but half the cost of operation. This would shut off the water supply from all its patrons, compelling them to suspend work. This is another illustration of the extent to which the hydraulic mines are the mainstay of this part of the State.

The various lines are owned by companies engaged in this industry, who, after supplying water to drift and quartz miners, ranchers, manufacturers and the like, use the balance in working their own mines. From the sales made they realize but a small portion of the sum required for keeping in repair the lines, but by diverting to their own use all for which there is no market are enabled to realize fair margins upon their investments. Very few people have even a remote idea as to the magnitude of this water-supplying business. The North Bloomfield company owns 157 miles of ditches, costing $708,841; the Milton company, 80 miles, costing $391,579. The Eureka Lake company 163 miles, costing $723,342; the South Yuba company 123 miles; Blue Tent company, 32 miles, costing $150,000. These are all Nevada county hydraulic mine owners. To keep their ditches in repair it costs them from three to three and a half cents per inch each year, exclusive of interest and the capital invested.

Greaterville District, Arizona.

Greaterville district has heretofore been counted a gold camp, but recent discoveries go to indicate that silver as well as gold is to be found, with every indication of a permanent and rich deposit. Greaterville district proper embraces a portion of the east foot hills of the Santa Ritas, and lies to the west of the Empire district and to the north of the Rightson, and not very far distant from either, and as both of the districts named are rich in silver there is no reason why silver should not be found in paying quantities in the Greaterville. We were shown, yesterday, a very rich specimen of ore from the Tenbrook mine, in this district, owned by Tom Belknap, H. C. Wiley and T. McCleary. It was taken from a streak 18 inches wide, out of the bottom of a shaft 20 ft. deep. The ore carries green chlorides, lead carbonates and black sulphurets. The ledge is well defined, in a porphyry formation. The assays show $290 to the ton. Work is being pushed on the claim; the shaft is going down on an incline. The mine is on the eastern slope of the Santa Ritas, on the north side of Hughes' gulch.

Gold placers exist all around the property, and are being worked every day. However, where a well-defined ledge exists, silver predominates. Besides the Tenbrook, the same parties own the Pawnee, Sunset and Pioneer claims. These have all more or less work done on them, and each makes a good showing. The claims lie compact, and, if the ore continues permanent, this is destined to become a property of great value. Besides these claims, Richardson and Robinson own the Yuba and other claims, which are making a good showing in silver. They are also operating on the west side of the Santa Ritas. One of the partners is now in the East, and it is expected on his return to enlarge the field of their operations, and the expenditure of a considerable sum, in the way of development work will follow.—*Arizona Journal.*

The Youngest Leads.—So far this year, the Ontario and Horn Silver of Utah have produced more than any other two mines in the United States. From January 1st to September 30th the Ontario produced $1,862,007, and the Horn Silver $1,264,129, a total for the two of $3,126,136. The only mine, except the Ontario, which has exceeded the Horn Silver is the Standard of Californie, which produced in the same time $1,323,663, or $59,534 in excess. There were only four others that ran a million for the same period—the Eureka Consolidated of Nevada, $1,212,242; the Tombstone of Arizona, $1,140,228; the Western of Arizona, $1,079,212, and the Northern Belle of Nevada, $1,032,026. Aside from the fact that both mines were at considerable extra expense in purchasing and erecting new and enlarged machinery during the past summer, up to the 1st of October for the present year the Horn Silver had paid $300,000 and the Ontario $725,000 in dividends. Though the mining industry of Utah is but in its infancy, and been less favored by capital than its sister States and Territories, it has shown that when its mines are developed they come to the front as leaders.—*Silver Reef Miner.*

GIANT POWDER,

Manufactured under Alfred Nobels' original and only valid Patents for Nitro-Glycerine Powders, which has been and still is of such immense advantage to the Miner, Railroad man and the Engineer. All other Nitro-Glycerine compounds, for instance, so-called Hercules, Vulcan, Vigorit, etc., are simply imitations and adulterations of the original Giant Powder.

The GIANT POWDER Company

Manufacture Three Grades of Powder, which are the

SAFEST AND STRONGEST HIGH EXPLOSIVES IN THE MARKET.

The Original Nitro-Glycerine Gompound

GIANT POWDER
=OR=
DYNAMITE

Is acknowledged by all the great Chemists of the world as unapproached by any other compounds, no matter under what names they may have been placed before the public, for instance, all Chlorate of Potash and Gun Cotton mixtures have been thoroughly tested and ried in Europe, and abandoned on account of their liability to spontaneous explosions.

THE JUDSON POWDER

Is a Black Powder owned and Manufactured by the

GIANT POWDER COMPANY.

It is from **Three to Five times Stronger than ordinary** blasting Powder, and is used by all the **Railroads and Gravel Claims,** as it

Breaks More Ground, Pulverizes Better and Saves Time and Money.

It has therefore superseded the ordinary Powder wherever tried.

TRIPLE FORCE CAPS AND ALL GRADES OF FUSE FOR SALE.

BANDMANN, NIELSEN & CO.,

San Francisco, Cal., General Agents.

Crookes'-Mitchell's Assaying—No. 1.

[Written for the PRESS by C. H. AARON.]

It may seem presumptuous for an ordinary assayer to call in question anything which may appear under the authority of a name like that of Prof. Crookes; but although that gentleman may know a great deal that we do not, there are some things which we are as competent to understand as any scientist, however eminent.

In the recent editions of Mitchell's well-known manual of assaying, by Prof. Crookes, is at least one alteration from the original, which does not appear to be an improvement.

In the article on weighing, the operator is cautioned not to depend on direct weighing unless with a very superior balance, but to place a watch-glass or a platinum capsule on one pan and weigh it. Then to place the substance to be weighed on the watch-glass or capsule, weigh the two together, and subtract the previously ascertained weight of the capsule, which leaves the weight of the object. This is weighing by difference. By proceeding thus, we are told that any errors arising from a want of equilibrium in the balance, or *of equality in the length of the arms of the beam*, are eliminated.

As it reads this is simply nonsense. The effect of the balance being out of equilibrium in the first instance is certainly eliminated by the counterpoising of the capsule, from the simple fact that the balance is thus brought to equilibrium before weighing the substance. The advantage to be gained by *weighing* the capsule, and going to the trouble of an arithmetical calculation in order to arrive at the weight of the object by difference, is not apparent. If the capsule is simply counterpoised by any means, and the object then weighed, the same result is arrived at with less risk of error, which might occur in the useless calculation prescribed. If the arms of the beam are of unequal length, the apparent weight of the object will be erroneous whether weighed by difference or not.

What appears to be meant, but which is not by any means stated, is this: If all the weighings of an assay or analysis are made on the same end of the same beam, a difference in the length of the arms is of no consequence, because it effects the apparent weight of the impure substance and of the purified product in an equal ratio, hence the relative proportions of the weights is not impaired, and this is all that the assayer or chemist usually requires. This is usually the case in regular analysis, and invariably so in bullion assays, in this country at least. With ore assays, however, it is different. The assay balance is never used for weighing the ore for the assay, being too small and delicate for such a purpose. The ore is weighed on the "pulp scales," which are usually sensitive to 1-20th of a grain or less, which is sufficiently accurate for the purpose. The precious metals obtained are weighed on the assay balance, usually an Oertling No. 12, sensitive to one 10,000th of a grain in many cases, and always distinctly indicating 1,000th of a grain. In thus using two separate balances, it is necessary that the weighings should be correct absolutely; in terms of the weights employed and within practical limits, and if there should be a difference between the lengths of the arms, the error thence arising would not be eliminated by operating as directed by Prof. Crookes.

In a reasonably good assay balance there is never any appreciable difference in the length of the arm, but in case such a discrepancy did exist, the effect could only be eliminated by ascertaining its percentage value and correcting each weighing, or by *double weighing*, of which there are two methods, namely, reversal, and substitution.

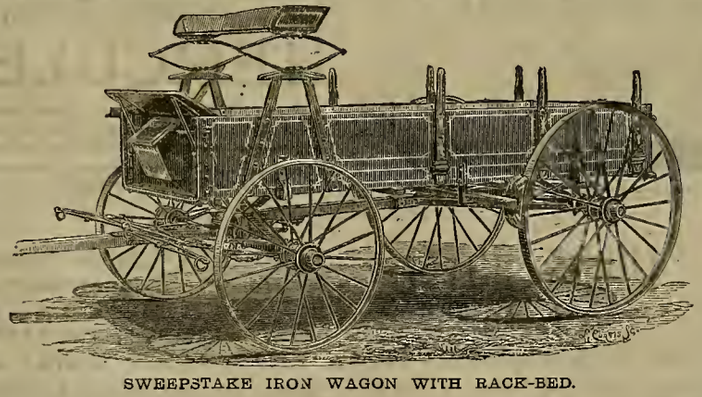
The method of reversal is performed by weighing the object on each end of the beam, the balance being first adjusted to equilibrium, for it must be remembered that the condition of equilibrium is quite a different matter from equality in the length of the arms. The true weight of the object is the geometrical mean of the two apparent weights; but unless the difference is considerable, the arithmetical mean, found by adding the apparent weights and dividing the sum by two is sufficiently accurate. In weighing by substitution, the most convenient manner is to place on one of the pans, one of the larger weights of the set, say the 1,000 (10 grains or 1 gramme), and counterpoise it. The weight is then removed, the bead or other object put in its place, and smaller weights added until the counterpoise is again balanced. The difference between the weight removed and the sum of the weights necessary to restore equilibrium is the weight of the bead. It is best to make a permanent counterpoise for the 1,000 weight, using it, of course, always on the same pan. To weigh out 1,000 of bullion for an assay, it is only necessary to balance the counterpoise with the bullion.

While on this subject, it may be as well to mention that the weight of pure salt which is equivalent to one gramme of pure silver, as given by Mitchell in the directions for the humid assay of silver bullion, is slightly incorrect, according to the atomic weights given in the same book. Instead of 0.5427 grammes, it should be 0.5416+. A similar error occurs in the directions for the humid assay of lead ores, in which the percentage of lead in sulphate of lead is given as 68.28 instead of 68.32. These seeming errors are not corrected in the late editions. They are not, however, of great importance in practice here.

MR. CLIFF has resigned as Superintendent of the Empire mine, Plymouth, Amador county, and Robert Robinson, formerly of the Oneida, has taken his place.

The Sweepstake Iron Wagon.

We give on this page an engraving showing the trim and symmetrical appearance of the sweepstake iron wagon. This is a California invention, and has achieved a good name all over the State. In our dry climate, during the long summers, wooden wagons often "come to grief." This wagaon ought to be specially useful in the arid regions of Arizona and New Mexico during the hot seasons. The wagon is a most important mechanical aid to industry. Upon another page of this week's PRESS may be found a detailed description of the design and construction of the important parts and the general value of the whole vehicle, to which the reader is referred.



SWEEPSTAKE IRON WAGON WITH RACK-BED.

The Railroad Bridge at Yuma.

The engraving on this page shows the Southern Pacific railroad bridge at Yuma, where the road crosses from California into Arizona. A description of the route to this point and of the crossing itself will be found in the letter of our special correspondent on the second page of this number of the PRESS.

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SOUTHERN PACIFIC RAILROAD BRIDGE AT YUMA.

PROGRESS OF SCIENCE.—Prof. Clark Maxwell looks for the day when physicians in London will examine their patients by auscultation in any part of the Kingdom, and when the Entomological Society, putting a microphone in a nest of scorpions under the tropics, will be able to compare their music in rooms of the society with that of the nightingale or that of the cat, and thus increase the interest which has been awakened by Wood Mason's discovery of a musical apparatus in those venomous insects.

A LARGE share of the ore and base bullion output of the Wood River region finds its way to Salt Lake for reduction and refining. It is hauled cheaply as back-freight.

WOOD RIVER miners continue to arrive in Salt Lake in squads, and will remain there till spring. All bring good reports of the country and its mines.

Metallurgical Centers.

In previous numbers the MINING AND SCIENTIFIC PRESS has advocated the establishment of metallurgical centers where ores which we term rebellious could be worked in quantity with the advantage of being able to mix them with freer ores. Of course in such cases it would be necessary to have managers with special knowledge and of great experience in the treatment of ores, and everything would have to be on a large scale.

Older countries have these facilities, and, now that our means of transportation are rapidly increasing, there is no reason why we should not also have them here. It only needs men of capital to take hold of it to assist very greatly in the development of our mining resources and at the same time to make money for themselves.

In Australia efforts are now being made for the formation of such centers. A Board appointed in Victoria, N. S. W., to report on the methods of treating pyrites, and pyritous vein stuffs, in discussing the subject, say in their report: "We are fully of the opinion that the establishment of large central works for the treatment of pyrite on the most thorough and approved system would be a very great advantage in every respect. Such works would give rise to many new industries, besides tending to the production of large quantities of gold. It would be necessary to establish works on situations easily accessible to railway communications from the Gold Fields, where the supply of raw pyrites could be regularly and easily obtained. There would be no objection to the occupation by such establishments of advantageous sites on the ground of injury to public health, as the fumes given off in the process of roasting pyrites would be condensed for the purpose of securing the sulphur and arsenic." We said that more than 72,000 tons of pyrites and pyritous ores are treated in Victoria every year, and the Board says "tens of thousands of pounds are annually lost to the Colony by the non-existence of such establishments as are advocated."

The conditions here are the same, and the necessities the same. With a sure market for certain classes of ores here, many mines would be worked on this coast which are now idle. Men who cannot afford to run metallurgical works in connection with their mines, would work the mines if their ore could be sold, or could be sent to reliable works for beneficiation.

A NEW PACKING COMPOUND.—A compound of India rubber and asbestos, which is to some extent a new combination, is now used as a packing for valves, its peculiar properties rendering it particularly fit for this purpose. For range valves or high-pressure hot water cocks, it appears invaluable. As it contains no wire, it can be cut to any required size, and will stand any temperature; at present it is used most for packing steam joints and large valves.

THE consolidation of the iron manufacturing companies under the title of the St. Lewis Steel and Iron Company is almost perfected. The total capital stock is $50,000,000.

THE Southern Eureka mine, Plumas county, has been listed on the New York Stock Board.

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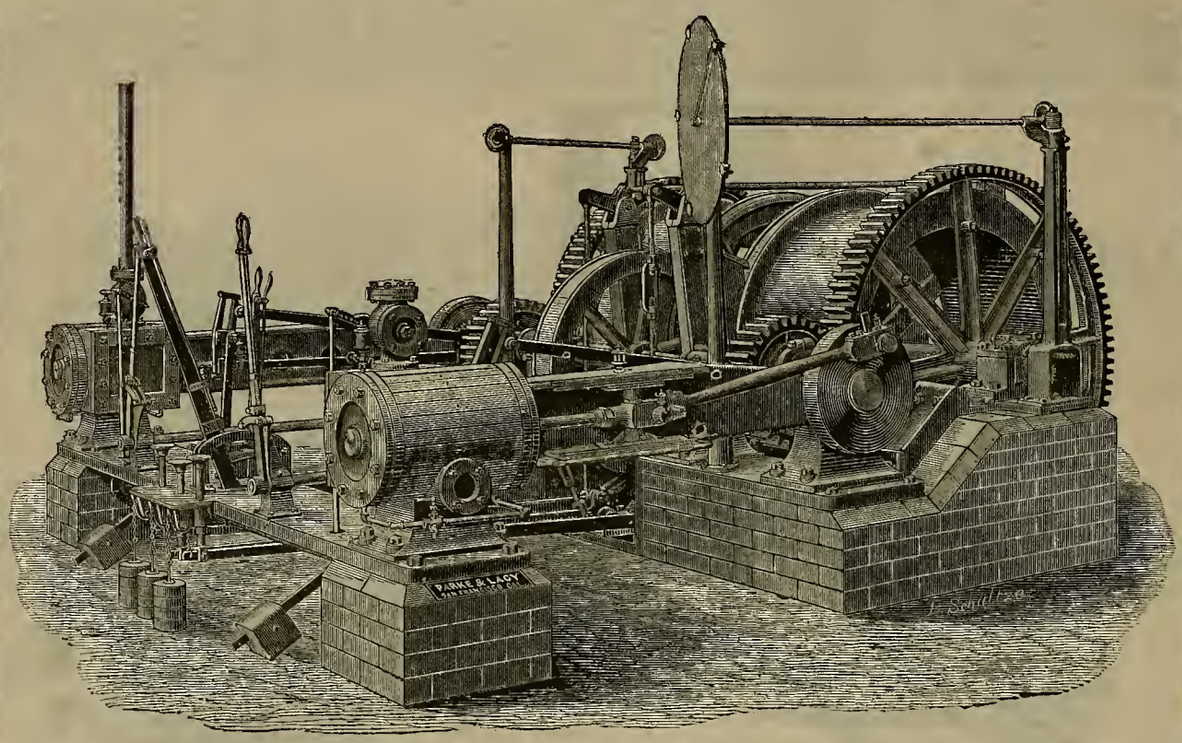
Improved Blowers—Baker & Roof's.



Pressure Blowers—Sturtevant's.
Inspirators—Hancock's.
Hoisting Engines—Niles.
Fire Extinguishers—Babcock's & Champion.
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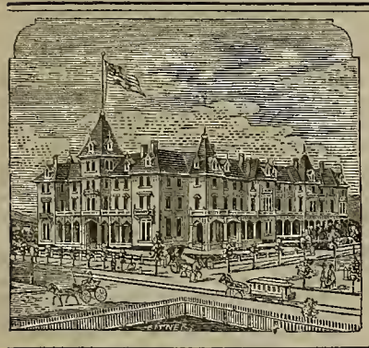

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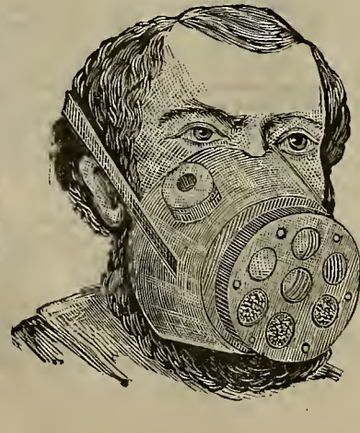

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Quartz Crushing Machinery.

A Lecture to Mechanics and Apprentices.

At the meeting on Thursday evening, Mr. John Richards, Superintendent of the San Francisco Tool Works, delivered to the young mechanics and apprentices of this city a lecture on "quartz crushing machinery," of which the following is a report:

The common processes for pulverizing quartz or mineral stone can be divided into four classes or divisions:

First—By *percussion* or blows, including stamps and all similar machinery operating by impact.

Second—By *pressure*, represented by machines having short range and positive movement—Cornish rollers, for example.

Third—*Masceration*, or rubbing action, represented by that class of machines where mullers are employed.

Fourth—*Disintegration*, when the particles or pieces are reduced by attrition, or as we might say, worn away by striking against each other, or against parts of the machine.

The advantages of these different methods are to be judged from two standards—mechanical and economical—not that these two things are essentially different, for in the end they become the same thing, but because in the progress of invention and improvement the mechanical standard seems to be almost alone the only one considered.

In nearly if not all descriptions of quartz crushing machinery you will find explanations of mechanism—the manner of operating; but of the nature of the process, or its "genesis," as we might say, not one word.

Before proceeding to speak of these several processes, and apply to them the test of mechanical and economical principles, I will lay down, as well as I can, some of

The Mechanical Conditions

Under which all quartz or stone crushing machinery must operate.

These conditions, or principles they may be called, are general, or universal we might say—not confined to quartz machinery alone, but applicable to all kinds of machinery.

The first of these conditions to which your attention had been called, is the strains of machine action, whether resisted by moving or fixed surfaces, absorbed by inertia, or resisted by framing. Whatever power is put into a machine must pass out again less what is absorbed by friction. This is inevitable, and you will find in all machines driven by hands or otherwise, a force transmitted to the work, or in some other way absorbed, equal to what is communicated to or put into the machine.

The methods by which this force passes out of a machine, or is applied to work, determines the strains of machine action.

Take the case of a lathe for example. The driving power of the hand passes off mainly at the point of cutting, communicating strains in various directions to the carriage, spindle and framing. A rock-breaking machine is a still plainer example, because the expended force is nearly in one plane. The force of the hand, moving 1,000 ft. in a minute, is communicated by reducing mechanism to the jaws, which may move two ft. in the same time, the proportion being as 500 to 1. The strains in the two cases would be as the speed—that is, the pressure on the jaws would be 500 times as much as on the periphery of the driving pulley.

What I want to particularly point out now is that these

Strains Wherever they Pass off Must be Resisted.

Action and reaction are equal. A force exerted in any direction generates an equal force in an opposite direction, so that in machine action wherever a force passes out of a machine there is an equal force passing back into the machine. Perhaps a simple lever will make this more plain. To use a lever we must have a fulcrum, or as we might say, two fulcrums. The force on the fulcrums and on the work are equal.

This law of machine action you can see proved in every example. Machines that exert great force, such as pinches, rollers, presses and so on, have heavy, massive frames to resist reactive strains. There are, however,

Two Methods of Resisting these Strains.

You are all familiar with stamp mills and the method of their construction. They are a neat kind of machine, not capable of withstanding much strain in any direction. I doubt if the framing or other parts of a common quartz battery would stand a sufficient strain to crush a piece of quartz as large as an egg. A small piece of quartz would answer as a fulcrum for a lever that would pull the parts of a common stamp battery into pieces. Here then seems an anomaly! The best known and most effective quartz-crushing machine, surpassing all others in endurance, yet without strength enough in its framing or parts to crush a pebble of quartz! The force given out must fall equally in reaction on something, that is evident. If the stamps descended slowly and positively as the jaws of a rock-breaker do, we would soon see where this reaction force was expended. One stroke would be enough to lift the framing from the battery.

The Force Expended on the Quartz

Is absorbed by the inertia of the stamp head, stem and dies. The force of the driving hand is communicated by the cam and tappete to the stamp and stem, raising it by a force acting throughout nearly one-half the time. This accumulated force is expended on the quartz in perhaps one-hundredth part of the time, and with an intensity, or measure, corresponding to these relative times of action. The reactive strains of the blows are not communicated to the framing of the machine, only concussion or jar. The driving force that does fall on the framing is communicated from the bearings of the cam shaft. This strain is slow and easily resisted.

This matter of inherent strain in machines and the framing we find resolved into a proposition like this: In all machines acting by impact or blows, the force expended on the work does not react on the framing, but is absorbed by the momentum and inertia of moving parts. Second—That all machines with positive or direct action have to resist in their parts a reactive strain equal to that expended on the work. Here you will perceive a broad distinction between stamps and all machinery having positive movement, rollers or mullers for example. The value of this distinction we will consider further on.

The Second Condition of Machine Action

I will call your attention to, is the maintenance of cutting or abrading edges and surfaces, the point where power is given off, so to speak.

In machines for cutting metal their action is expended at the cutting edges of the tools, and the maintenance of these edges is the most expensive part, except attendance. It includes tools, tool dressing and grinding. In wood cutting the maintenance of edges is also an important part. Whenever a machine deals with material, whether by cutting, crushing, rubbing or otherwise, there is a constant destruction of the implement, he what it is, that stands between the machine and the material acted upon.

In a stamp mill these implements are the shoes and dies. In other quartz crushing machinery they are represented by the surfaces that come in contact with the material. The abrasive wear of metallic surfaces in quartz crushing is a matter you are all familiar with. In any particular method of pulverizing quartz, there is

Worn Away by Abrasion

An amount of iron or steel corresponding with the quantity of stone crushed; the same as there is a nearly regular amount of edge worn away in cutting iron or wood, only much more. This wear is one of the principal items of expense in maintaining quartz crushing machinery; and I incline to the opinion that the wear of such surfaces is in proportion to their rubbing action mainly; that is, the wear of the abrading or acting surfaces is least when they act parallel to each other. I am also of the opinion that the wear of such surfaces, shoes, dies or the jaws of a breaking machine, for example, is not in proportion to the hardness of the material employed, but as its friability. Every mechanic is aware that a hard file can be rapidly ground away on an emery wheel, while a piece of soft iron can not. The surfaces of Cornish rollers, I am informed, wear longest when of wrought iron, and I think in respect to shoes and dies a close hard, but at the same time malleable material will last longer than a hard one, or one that is friable.

What I want to point out in this connection, is that in

Stamps or Percussive Machinery

For ore crushing the wearing surfaces are provided from cheap material, and require but little fitting to prepare them for use. Shoes and dies for stamp mills, with the required preparation, are worth only — cents a pound at this time, while for any machinery operating by positive motion, rollers, mullers and so on, the wearing surfaces would cost much more for renewal. At the late exhibition here there was, for example, a machine where the abrasive or crushing surfaces were of tempered steel or chilled iron—I do not know which; but at any rate would require turning, and would cost perhaps three times as much relatively as shoes and dies for a stamp mill. Not only this, such rollers if of hard material would without doubt wear away much faster than if made of some close malleable material.

In a common stamp battery the crushing faces, so to call them, approach each other parallel; and, aside from the slight rotation given by the cams, there is no rubbing action. Such rubbing action is required in that case to cause a uniform wear upon the die faces, and is perhaps just enough for that purpose; so that in respect to use as well as first cost, we find the percussion or impact principle the most favorable in an economic way.

The third condition of operating, to which I will call your attention, is

Maintenance or Wear,

Including the regular depreciation and accidental breaking of parts. At first thought it would seem that machinery acting by impact or blows would be more liable to accident than that which operates by pressure or rubbing. This would be true of pressure machinery that expends its force on metal as in the case of steam hammers; but it is not true of ore-crushing machinery, when the dies drop on a layer of quartz and pulp that cushion them.

If a battery was so perfectly made that the dies and shoes would fit on their faces, and such a battery was ran without anything in it, then the analogy to metal hammers would hold good—the results too, perhaps; for I imagine the heads would split, the tappets move, and the machine become a wreck in a short time.

Wear in Stamp Mills.

Compared with other ore-crushing machinery, the percussive class is more free from wear and accident. Taking a stamp mill for example, there is no strain to speak of on any moving joint. The principal stress is of course on the cam-shaft bearings, but that is not great, and, as experience proves, these bearings are easily maintained. The other joints, we may call them, where wear can take place, are the stem bearings, and the contact surfaces of cams and tappets. Both these joints or bearings, as well as those of the cam-shaft, are placed far above the stamps where the surfaces can be protected from sand and grit, where they can be oiled or examined without trouble and renewed without much expense.

If you will now consider any

Machine Operating by Pressure,

Masceration or disintegration, you will in most cases find bearing surfaces that have to withstand a pressure equal to that applied to the quartz. I know that in some machines this pressure is balanced by a double action; that is, one surface acting against another, as in the Redstone machines; but in the case of rollers, and indeed in nearly every machine, the stamp mill excepted, you will find bearings in the vicinity of the quartz that have to resist great pressure, and which must be kept close. Such bearings must soon be destroyed, and it requires no wide experience to determine the wearing life of such machinery without seeing it at work.

In all machinery acting positively with great pressure and on hard substances, the breakage, as we call it, is an important item in maintenance. In this class belong rolling mills, bolt and rivet machines, presses, pinches and most kinds of quartz machinery, not included in the impact class.

Facts of Experience.

I will digress here to remark that no doubt most present have thought that the best method of determining these various conditions of machine action would be to observe and collate facts. This seems a most thorough way to reach true conclusions, but it is unfortunately impracticable, and if practicable, could not be applied to hundreds, perhaps thousands, of quartz-crushing machines yet to be invented. The facts of past experience, even if they could be collected and compiled, could only be applied to new inventions by analogy, and to be able to draw such analogy, the present method of investigation is necessary.

In a former lecture I had the honor to deliver here, your attention was called to the value of analytical reasoning, respecting mechanical problems. It is especially important in our present subject, because the process is not a common one, and but little is to be drawn from popular conclusions.

Returning now to the

Cost of Maintenance,

There is one factor in such cost that I may not be able to make so plain as the wear of dies. I mean the interdependence of parts one upon another. This is an element of much importance in many kinds of machinery, as well as that for ore crushing.

Suppose, for example, that a quartz mill of 10 stamps will crush 10 tons of ore in a day, and that one of the steam stamps, such as are made in England, will do the same work, the cost of the machinery and running expense would perhaps be much the same, but there would be this difference: The steam stamp would depend upon each part; a single screw broken would stop the machine; to put in a new die would stop all; the product, too, would have to be the same in order to get a good result from the power expended. Such a machine, if kept operating three-fourths of the time, would do well.

The common stamp mill, on the contrary, would in most respects represent 10 machines, each one almost independent of the rest. It is true the parts would be more in number, but the chances of delay from accident would not be nearly so great as in the case of a single stamp of 10 times the capacity. One battery could be stopped; the other would go on just the same; or anyone of the 10 stamps could be "stopped up" in an instant, and the rest go on.

I could go on with various other conditions of operating, such as feeding and clearing batteries, the uniform resistance to motive power, and so on, but time will not permit. I had also, at the beginning, intended to carry our investigation to machinery acting by pressure, masceration and disintegration, but the rest of the time can, I think, be better spent in some general remarks. What I have thus far said, has been mainly to call attention to a method of investigation. The value of this method you can yourselves determine by applying it to the history of ore-crushing machinery in this and other countries.

For centuries past,

The Stamp Mill,

Or other machinery with percussive action, has held its place as the best and most economical. Mineral stone, or quartz at least, is a hard material of crystalline structure. Stone that has been melted, and is homogeneous, a blow rapidly given will cause more fracture than the same force applied as pressure or in rubbing. The first ore reduced was, no doubt, pounded fine with hammers; so was the last crushed to-day, and so will the process be carried on in the future.

There have been in California many inventions in ore crushing; most of them relating to stamps have been of value, and mark an advance, but there have also been many inventions, some of them costing large sums of money, that were founded on principles at variance with the operating conditions pointed out this evening. The premises have been wrong; the starting point, instead of being an effort to supply some wanting element in the process, has generally been some new mechanism that supposedly would give results better than a stamp battery.

I venture the opinion that in a process so simple and backed up by a long train of experience,

There Should be no Mistakes

Made as to the value of new ore crushing machines, not in so far as pulverizing at least.

I do not, however, claim that the several propositions laid down this evening cover the whole ground—far from it. Yet the methods pointed out, if fully and completely applied, will, I believe, determine the true merits of new inventions without the expense and labor of constructing machines for experiment.

A little more than a year ago I was consulted as to a proposed new method of crushing quartz. The subject was new to me and I may add fortunately so, because I began at the beginning and proceeded inductively, so to speak, but for all that, came near running into a great error.

The Proposition was to Employ Rollers.

Not the common Cornish arrangement, but one more elaborate and involving details which need not be described now. As is always my custom in such matters, the first thing was to examine the history of the art, and observe its tendencies. I found in California that reciprocating breakers were employed instead of rollers. I knew also that since the introduction of these machines in Europe the rollers had given away to them. Stone crushing at the mines and for streets was done by reciprocating machines—yet it was difficult to see why a large roller revolving continuously would not far exceed the performance of a reciprocating machine with one-tenth of the surface and still less speed. The problem was a quandry in my mind for a month, when it was cleared up in a few minutes by a proposition mentioned, I think, previously this evening, namely, the capacity of a machine for crushing is as the parallel approach of the acting surfaces or their angular velocity. I had been counting the circumferential velocity of rollers, not the angular velocity of their periphery, and to my astonishment, I found the rock-breaker outrun the revolving roller.

Measured by this standard all became plain, the supersedence of Cornish rollers was no longer a mystery but a natural sequence of improved mechanism and method. [Illustrated on the blackboard.] This I relate to show how certainly one can reach correct conclusions without experiment if the true premises are gained and deductions made accordingly.

The methods I have described are those of the consulting engineers, a profession almost unknown in our country.

Investments are Made here in new Inventions and Schemes

Without such precautions as are employed in older countries. In matters of law or indeed in nearly all cases except engineering or manufactures, the counsel of skilled persons is called in, but in new mechanical expedients, the Keeley motor for example, the shareholders do not think it worth while to consult a scientific man or competent engineer. Suppose two men were to start out to-morrow to search for capital to be employed in two undertakings; one to develop some new motive power on principles that controverted all the established laws of dynamic science; the other to establish the manufacture of horse shoes and hoes, which do you think would succeed best? The tendency is to the marvellous; the popular conception of invention is that it is chance and accident. Let me assure you this is not so, and that inventions and true progress can become a matter of principles and demonstrative science. Since I have lived in San Francisco I have seen thousands of dollars expended on machinery that controverted several of the very plain operative conditions before named. Everyone, almost, thinks himself competent to pass opinions upon quartz crushing machinery, mechanics and miners perhaps least of all.

In all such cases where one meets an inventor of quartz crushing machinery, the first question should be what particular part of the present method is at fault, and how is your machine to remedy this? Second, is it certain the new machine embodies all the functions and advantages of those now in use. There has been

An Age of Chance

In these things—a time when a tailor, a shoemaker, or politician might invent mechanical processes and machines, but that time is almost gone. It was the dark age, so to speak, of invention and of dynamic science. A little of this kind of invention remains—discovery we should call it. In chemistry, for example, and in electricity and magnetism, where intangible gases are dealt with. I firmly believe in respect to ore crushing machinery that there is in this city enough and more than enough knowledge of the process to enable a complete judgment to be formed of any new machinery for the purpose without experiment.

I know too that there are not many who will concede this, and that it is almost a heresy to make such a proposition, but I ask especially of the younger mechanics here to-night, to remem-

ber tbis and see if tbe future will not prove tbe assnmption.

For 30 years it bas been my fortune to be in some way identified with the construction of mechinery, tbe most of it novel, or at least varying from the heaten path; and every year as experience goes on tbe more I see proves that in the future, and not distant, nearly all processes in converting common materials snch as wood, stone, metals and so on, will be determined without experiment.

As remarked in a previous lecture, I ventured such an opinion ten years ago respecting metal-working tools, thatis tools forcold processes, sucb as turning, planing, drilling, milling, and so on. Tbe idea met with some criticism, not to say derision, especially among the chance schemers, bnt it has been steadily gaining ground, especially in continental Europe, and more especially in Germany, where tbe science, so to call it, of mecheuical analysis has a fast hold. In our own country the great advances made in mechanical art has been mainly

Due to Quick Perception,

Rather than methodical deduction. Tbe experimentel method is safest and surest up to a certain point, when the margin of improvement becomes narrow, tben tbe inductive method must prevail.

We are tending that way but not so fast as we might. With fifty millions of population we have fewer technological schools than Sweden with a populatiou of four millions. Northern European countries, including even Rnssia, which the Englisb tell us is uncivilized, are in advance of this country and England in the matter of technological schools.

The effect of their system is being felt all over tbe world, and we csnnot much longer ignore its importance. Our wonderful skill in making things is more than balanced by our competitors understanding them better. They will learn to make our products in time and unless we employ their means may excell us.

To illustrate tbis let me ask bow long the Keeley motor humbug would have lested in Northern Europe, Germany, or Sweden, for example. I do not think thie ebameful humbug could bave existed there eigbt weeks, much less eight years. We bave here all the elements of a rapid and wonderful progress in mechanical art, except the analytical metbods of investigation, and if I have succeeded in causing some interest in its applicatiou to orecrnshing the objeot of this evening's lecture hes been attaiued.

A Debris Compromise.

A Proposed Plan for Overcoming the Difficulties.

EDS. PRESS :—The recent visit of the committee of merchants to tbe region most effected by the "slickens" question bas rcsulted in great good, by paving the way for an amicable adjustment of the difficulty between tbe farmere and the miners, without stopping the great industry of hydraulic mining or causing further injury to tbe farming interest. The opinion of Gen. Rosencrans, one of the committee, that to stop bydraulic mining by legal process will not seve the farmers, on account of the immense quantity of debris already accumulated in tbe river chaunels whicb must inevitably come down with the winter floods and bury the lands below if not checked or coutrolled in some way, is strictly correct, and brings into prominence the leading fact on which must be based a compromise of the conflicting interests. The proposition of Mr. Hamiltou Smitb, Superintendent of one of the leading hydraulic mines, to impound all futnre debris from the mines on the Yuba river, by conetrncting an immense stone dam in a deep gorge at a suitable poiut, which will catch and hold back in the mountains all debris that will ever be discharged into tbat stream by the future working of these mines, is entirely feasible and cleerly indicates the proper remedy to be adopted. The failure of the brush dam erected at the expense of the psople of tbe State resulted from ite being built in the plains insteed of tbe mountains. Had the money been expended in building tbe stone dam proposed by Mr. Smith on the Yuba and a similar one on Bear river in tbe mountains eomewhere, tbey would have proven effective and permanent in character.

But, to build such dams and to protect tbe valley lands from the debrie already accnmnlated below the points where the dams may be located, will require a large eum of money, to be furnished by private individuals, and expended under a uniform eyetem or plan of operations whicb shall apply to all mining streams alike. We say it must be done by private enterprise, because it must be accomplished speedily and economically; neither of which objects can be secured by public appropriatione. All euch enterprises undertaken by tbe Government degenerate into political jobe and gigantic ewindles extending over as long a period as possible. Our recent experience in "slickens" legislation and brush dam building ought to eatisfy ue on that point. To enlist private capital in any enterprise it must he shown to he not only practicable but profitable as an investment. Tbie we will endeavor to ehow briefly without entering into details at the present time.

Proposed Re-working of River Beds.

Having carefully examined into the topographical features and tbe economic value of the channel of Bsar river and its immense deposit of hydraulic tailings, togetber with the original unworked bed and banks buried under tbem, with a view to the re-working of tbe same, tbe writer of tbis (an argonaut and practical miner) became convinced tbat many millions of dollars lie in tbat channel, a sure reward to the parties who shall re-work its contents for a distance of 20 miles or more below the bydraulic mines tbat discharge their tailings into it. Anyone cen satisfy bimself of the correctness of this opinion by visiting the locality and learning from the old settlers the history of mining operations on that river and its branches from "the days of 49" to the present time. They will tell you that the original river bed was never worked by Chinamen, having tbemselves been driven out hy tbe rapidly accnmulating deposit of tailings, while they were making large wages with the sluice or rocker in the rude end wasteful manner of saving gold of those early days. They will tell you that the tailings from tbe early workings of the hydraulic minee were far richer than those of tbe present time, with paved flnmes, nndercurrents, etc., whicb are now employed to largely increase the percentage of gold saved in washing. They will also tell you, and yon can see for yourself, that nndercurrents have been put in at varions pointe many miles below the mines, over which pass the fine sand and gravel flowing with the current at all times, leaving enough gold and amalgam to pay well for the labor and money expended, though catching but a moiety even of what is brought down to them from above. There are also hundreds of tons of quioksilver deposited in the channel with the tailings, whioh would be recovered by re-working.

It ie claimed and believed by many tbat tbe sulphurets and black sand, when concentrated from the tailings, are valuable for the gold tbey contain, independent of the free gold and amalgam with which they are associated. The same condition of tbings exists upon the Yuba, Feather and American rivers, and all others which serve as outlets to the hydraulic mines. They all contain sufficient gold to abundantly reward those who will re-work them; and tbe plan of operations proposed for Bsar river will apply to each of the others.

A Sketch of a System of Operation.

Any system of operation that may be adopted must not only remove the deposit of tailings already accnmnlated in tbe channels of the rivers as well as those to be deposited hereafter, but must make such disposition of tbem as will insure the country below againet injury from the debris set in motion by tbese operations; for the waters of these rivere must continue to flow to the sea, in the future as in the past. That such a system is practicable and may be operated with the means and skill of private individuals, associated together as in other large mining enterprises, we will endeaver to ebow.

All these streams have a heavy fall or grade in the mountain region, tberefore dams may be constructed at almost any given point—not hundreds of feet in hight to bold back the debris, as Mr. Hamilton Smitb proposes, but 10, 20 or 30 ft. only—to give a sterting point for the head of a flume into wbich the tailings may be directed with the aid of tbe stream flowing naturally down the channel of the river. Build the flume with a pertition, dividing it lengthwise, making a double flume in fact, one-half for summer and the whole for winter nse. Carry tbis flume along tbe bank of the river down to some large ravine pntting in, and extend it along tbe bank of the ravine to its head, or near it, into wbich the debris is to be discharged until it wi l serve for tbat purpose no longer, after which the flume may be extended across to tbe opposite bank, and continued along to its junction with the river, and along down the bank of the latter until tbe next ravine is encountered, which being filled like the first, the flume is again extended in like manner to the third and so on to the end. If there is grade sufficient, and otber facilities, tbe arrangements for saving the gold otber than tbe paving of the bottom of the flume, which begins with the flume itself, may be introduced before reaching the first ravine, and the water and finer portion of debris, not tbrown out by the grizzly, taken up egain and carried onward in the flume to the ravine. It will generally be most convenient, however, to put up the gold-saving apparatus in the ravine, as it would otherwise give too little room for tailings, and too short a distance of paved flnme; for of couree, no paving or other gold-eaving appliaucee wonld be required after passing beyond the first plant of grizzlies and undercurrents, or such other macbinery ae may he adopted. It is expected that in taking np the tailings in a flume eo far below the mines no large bowlders will be eent into the flnme, they being lodged bigher up the stream. Below the gold-saving station a emaller flume will be required than above, thereby diminiehing tbe cost of construction. The coaree gravel will be screened out and left at the first or gold-eaving station, consequently ample room must be reeerved for the purpoee.

Disposition of the Debris.

In working out the bed of tbe river and the depoeit of tailinge above the dam, it will be neceeeary to extend the flume np etream as the work progresees. This will be accomplished hy working a eection of 1,000 or 2,000 ft. of the cbannel at a time, by erecting a temporary dam tbat distance above the first, so ae to run the water and material above tbe new dam, in a direct course down to tbe flume, over what may bs supposed to be the lowest portion of the bedrock, on wbich the flume is to rest wben extended. Tbe contents of this eection between the two dams, is then conveyed into the flume. If it is possible to have the aid of a small stream under ligbt pressure, with bose and nozzle, it will he a great advantage in wasbing the tailinge and light materiel at tbe sides towards the etream leading from the upper to tbe lower dam and tbence into the flume. If this is lacking then laborers will have to be set to work with wbeelbarrowe, and side or branch sluices leading to the flume. A line having been tbns opened down to the bedrock between the dams the flume ie to be extended up to tbe temporary dam with which it mnst be connected and the stream turned into it, wben the remainder of the unworked material in the section is run into the flume by the aid of sluices, wheelbarrows and derricks if necessary. In these operations tbe bonlders, logs, etc., are left in the channel after working, so piled against the sides as not afterwards to binder tbe flow of tbe current in the season of bigh water. Of course, there will be many obstacles encountered in managing the stream between tbe dams, especially while engaged in extending the flume up stream, but all can be overcome by skillful management by men capable of conduoting heavy placer mining operations. During tbe period subject to great fresbete tbis work would have to be suspended, and dams, flumes, etc., made secure against injury by high water. Provision must he mede of course, for the passage of tbe surplus water over the dam and along tbe natural cbannel of the river below, witbout destroying either tbe dam or the flume, eveu though a temporary additional flume were required along eide of tbe permanent one a portion of the distance, for such emergencies.

How to Handle the Debris below the Dam.

When the flow of debris to the valley is thus stopped the current will rapidly cut down tbrongh the accumnlated deposits in tbe cbannels leading through the valley, carrying them off to tbe sea. In otber words, the debris now complained of, occupying the cbannels of the Feather, Yuba, Bear and American rivers, will be sluiced out and carried to the sea very quickly unlese diverted by human aid to tbe tule lands for the pnrpose of reclaiming tbem. This should be done and may be easily accomplished by private enterprise, as a promising investment. If the farmers and miners do not choose to unite for the accomplishment of tbe project of the clearing of the whole length of the rivers, let the miners assume the expense and risk of tbe mining operations, and the disposition of the debris of the npper or mountainous portions, and tbe farmere assume the control of the lower or valley portions of these rivers. Let the State grant its tule lands to the corporation formed by the farmers for the purpose, and the individuale owning any lands to be reclaimed enter iuto contract to pay a etipulated price per acre for filling them in to a snfficient deptb. Tbese lands, now wortbless, will, wben filled in witb the finer portion of the debris, namely, tbe sand and "slickens" proper, be worth $100 or more per acre. The proceeds of thoir sale after reclamation, and tbe enhanced valne of the now submerged and threatened lands, will return to the stockholders their outlay and interest, to say nothing of the value of the river bed and banks in the upper or foothill portion of their district for mining purposes, after the removal of the debris therefrom.

To control the debris and reclaim tbe tule and overflowed lands, a dam will have to be built on each river at tbe proper point in the plains above the lands to be filled in, of only a few ft. in hight, just sufficient to give a etarting point for the head of a flume to convey the material to the lowlands, which will be brought down by the etream as it cuts its way down through the debrie accumulated above. This flnme will bave to be a wide one, divided by partitions lengtbwise into several channels, so as to use one or more, or all of them at a time, as the quantity of water and debris flowing through may require. In times of great floods, which no human power can control, tbese flumes and dams might be swept away; but as they are comparatively inexpensive, the loss once in five or ten yeare will not be serions. The flow of debris may be controlled in a flume, on a ligbter grade tban that of the natural cbannel, as is well known; consequently, several feet full may be secured in running the flnme to the dumping places in the lowlande, whence branchee may be extended for distribution over large areas.

There are many details connected with tbe scheme herein proposed, which will enggest themeelves to practical minde without calling attention to them in thie article. That the echeme is entirely feaeible the writer fully believes, and he bas endeavored to make it appear so to otbers. It ie confidently enbmitted ae a practical eolntion of the debris problem.

M. T.

TESTING WATER FOR IRON.—To ascertain if water containe iron, take a glass of water and add to it a few drope of the infueion of nutgalle, or euspend a nutgall in it by means of a thread, for 24 houre. If iron be present, the water will become of a dark brown or black color. Prnsciate of potash is a still more delicate teet for detecting iron. If a crystal, or a drop of it, wben dissolved, be added to a glaes of water containing iron, it will immediately become of a blue color.

Wages and Cost of Living in Arizona

From the pamphlet recently issued by authority of tbe Legislature, on tbe resources of Arizona, we take the following paragraphe on this important subject:

People who are looking for homes in a new country, naturally feel an interest in tbe region to wbich they think of emigrating, and more particularly in whet they can earn, and how much it costs to live.

Miners are paid four dollars per day tbrough-out the Territory. This ie tbe rate of wages for underground work which has prevailed in Nevada, and whicb hes bsen estabiiehed in Arizona.

In some small and isolated oampe, a lower rate has been obtained, but good workmen, who understand their calling, cannot be hired for less tban tbe prevailing rates.

Blacksmiths receive from $4 to $6 per day, first-class workmen getting the latter price; carpenters get from $4 to $5 per day; bricklayers and masons, $5 to $6 per day; engineers, $5 to $6 per day; printers, $4 to $5 per day; clerks, from $50 to $100 per month and board; teamsters, from $40 to $70 per month and board; herders, from $30 to $40 per month with board; farm laborers, from $30 to $40 per. montb, and day laborers, from $2 50 to $3 50 per day.

Tbe supply of labor ie generally in excess of the demand. Like all miuing countries wbich have recsived a sudden impetus from the opening of railroads, Arizona has drawn within ite bordere a numbsr of people who have found themselves, on their arrival in the country, destitute of means. While there is alwaye a cbance for men of energy and induetry to make their way, it is not advisable for mecbanics and laboring men, who have no means, to rush to Arizone. While tbose who are employed ohtain good wages; it mnst be borne in mind tbat tbie is a country whose many resources are just beginning to be developed and that the demand for labor is limited. To men who bave some means; who are in a position to take advantage of the many profitehle openings tbat preeent themselves; who may be in possession of a small capital to begin the battle of life; wbo have the wherewithal to try their fortune in seeking for the treasures tbat lie hidden in our monntain fastnesses, Arizona offers advantages not equalled by any State or Territory in the Union. But of the workingman, who has only meane sufficient to bring him to the country, and is dependent solely on his daily labor, Arizona has already enough, and it is not tbe desire or intention of this publication to bold out uncertain inducements to that class of emigrants.

The cost of living in the Territory is not more expensive than could be expected in a country, the greater portion of whose eupplies are brought from euch a distance. With tbe exception of eome grain, flour, hay and vegetables, everything worn or consumed by the people of Arizona is shipped from California or tbe East. In Tucson board can be had at from $6 to $8 per week, and at the leading botels at from $1 to $2.50 per day. In Tombstone, board is from $8 to $10 per week, and in the different mining camps througbout the southern portion of the Territory, the seme rates prevail. Rents in Tucson and Tombstone are not high, considering the rush of emigration to those towns, and the remarkable advance in real estate. A comfortable residence of three or four rooms, in a suitable location, can be bad in Tucson at from $20 to $30 per month. The ratee are about tbe same in Tombstone. Clothing, boots and sboss, dry goods, groceries, and everytbing necessary for housekeeping, are eold at fair prices. A suit of clothing can be bought at from $15 to $30; a pair of boots at from $4 to $8, and all other articles in a like proportion. Of groceries, sugar is 20 cents per pound; coffee, 25 cents; flour, $5 per cwt.; beef, 8 to 12 cents per pound; and vegetables and all other articles of food at similar rates. In Phœnix, the agricultural center of the Territory, prices of clothing and groceries are about the same as in Tucson and Tombstone, while grain, flour, vegetables and fruits, are mnch cheaper.

In Prescott and throughout northern Arizona the ratee of wages do not differ materially from those which exist in the southern country. Board in Prescott is from $8 to $10 per week. Groceries, clothing and provisions are a trifle higher tban in Tucson and Tombstone, owing to the greater distance from the Southern Pacific railroad, and the increased cbargee on freight. The opening of the Atlantic & Pacific will give northern Arizona a direct line to tbe markets of the Eaet, and eupplies and material can be laid down at Prescott and tbe northern mining camps, at much lower ratee than at present.

From tbis brief eummary it will be seen tbat tbe coet of living in Arizona, taking into coneideration tbe long dietance from the eourcee of enpply, cannot be considered high; and although theee figuree may appear rather large to people accustomed to those prevailiug toward the rising enn, it must be borne in mind that every branch of labor and every profeseion or calling receivee a great and generoue remuneration for ite servicee in this prosperoue and progressive Territory of tbe Southwest.

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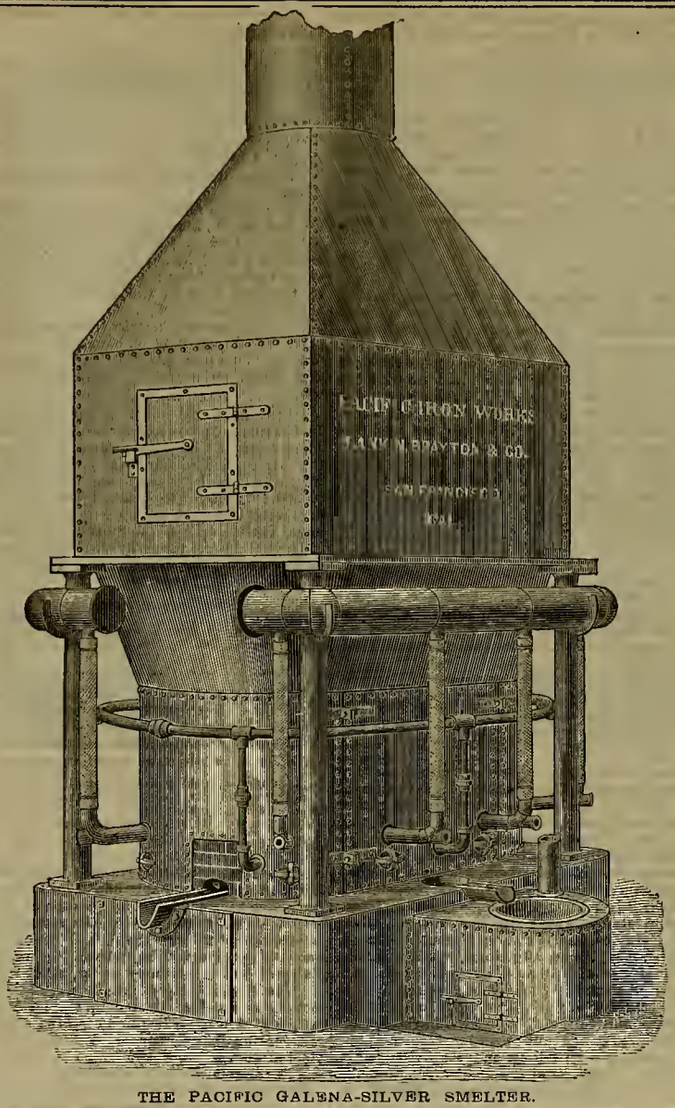

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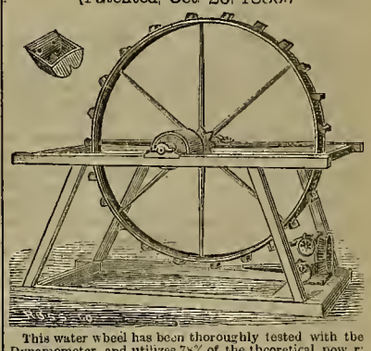

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Bullion Production of Arizona.

The mining progress of the Territory of Arizona for the fiscal year ended June 30, 1880, and for the six months of the fiscal year 1880–81 has been most remarkable. The inaccessibility of this region has heretofore been its most prominent drawback. The concentration of capital on the Pacific coast, so far as mining operations or mining stock speculations were concerned, almost entirely upon the mines of the Comstock lode, has also had very much to do with retarding its development. Indian disturbances, especially those connected with the subjugation of the Apaches, tended, of course, to the same end. All these conditions have in the last 18 months named greatly changed or passed entirely away. The cessation of profitable workings on the Comstock (as a basis at least for the concentration of nearly all the speculative capital of the Pacific section) has caused a great diversion both of labor and enterprise seeking occupation and opportunity, and of money seeking profitable investment. The Territory of Arizona itself, in its southern half at least, is traversed by a railroad constructed within the calendar year 1880. The Southern Pacific railroad is now operated from Yuma, on the Rio Colorado, at the western line, to the eastern one near the United States post, Fort Bowie, in Arizona, and the town of Ralston, in New Mexico, a distance of 339 miles within Arizona, of which 325 miles were constructed between February, 1880, and January 1, 1881. This road has opened the river mining districts, made directly accessible those of Pinal and Maricopa counties, and developed, as to travel and transportation, the whole of southeastern Arizona. The region has also been made accessible from the east by way of the railroad system of southwest Kansas, Colorado and New Mexico. The New Mexican portion of the Atchison, Topeka and Santa Fe system of roads was operated to within less than 100 miles, on January 1, 1881, of the point of junction with the Southern Pacific.

The Apache disorders have for four years past been only sporadic in character and have not greatly hindered prospecting and development within Arizona, though the Victorio raids of 1880 have impeded Eastern travel to the Territory in some degree. The largest factor in Arizona development, apart from the direct discoveries of mineral made, always the foremost one, has been in reality the activity of Eastern capital and the national interest aroused in mining investments, discoveries and developments during the past two years.

Arizona is divided into six counties: Apache in the northeast, Maricopa in the center, Mohave in the northwest, Pima in the southeast, Pinal in the center, Yavapai in the north and center and Yuma in the southwest. Apache county has but little special and present mining interest. Clifton, the seat of the Longfellow copper mines, and some placer ground in the valley of the Rio Francisco, are all that is now known.

Mohave County.

Mohave county is the seat of the oldest American mining in the Territory. Some California prospectors were operating there during 1854, and some work has continued down to the present day. The principal Mohave mines are located in the Cerbat district, Mineral Park, near Signal, and in the Hualapai mountains. The McCracken and Signal mines are those that are best known. It is difficult to get a full exhibit of the product of this region, as a considerable amount of work is done under the leasing system and the tributaries carry their small (individually speaking) product to Prescott, Ehrenberg and Yuma, so that, when dispositions of, its figures in other returns. For the fiscal year 1880 the production of Mohave county, as reported, was, gold, $17,350; silver, $178,329. For the six months ended December 31, 1880, an estimate based upon the Territorial newspaper reports will be moderate if put at $120,000, and for the calendar year the total may be stated at, in gold, $20,000; silver, $210 000. The larger portion of this product comes from the Signal mill, and one run intermittently on McCracken ore. The Mineral Park mill has also run part of the time.

Maricopa County.

Maricopa county has an increasing product to show. Its mines, with the exception of the famous Vulture (gold) and the Tiger (silver), are small at present. The Vulture mill now employs 80 stamps, and its product will be large in the near future. The product for the fiscal year 1879–80 was as follows: Gold, $90,072; silver, $238,119; total, $328,191. The product of the Tiger mine is stated at but $17,000, which can be only partial in character. The product for the calendar year may be estimated at, gold, $120,000; silver, $280,000; a total of $400,000

Pinal County.

Pinal county contains within its borders the famous Silver King mine, located in the Pioneer district, with several other mines developing about it, and the Globe district, which produces largely in gold and silver, with the Richmond Basin and the Mineral Creek districts, also largely productive.

For the calendar year 1880, the annual report of the Silver King Co. shows the following: Gross receipts from sales of ore and bullion, $505,641.91.

The *Mining Record*, of New York, gives the following items of production for the calendar year 1880 from the mines named, to wit:

Silver Nugget, Globe district (silver)	$19,272
Stonewall Jackson, Globe district (silver)	28 500
Mack Morris, Globe district (silver)	101 966
Golden Eagle, Globe district (gold)	80,000
Total of definite amounts from mines named	$229,738

The Arizona *Star* of January 1, 1881, gathering its data from the railroad freight returns of Pinal county bullion shipments being made at Casa Grande station, Southern Pacific railroad, gives the following, which include all shipments for the calendar year from the Silver King mine and the mines of Globe:

Concentrations, silver	940,000 lbs.
Silver ore (high grade)	140 tons
Silver bullion	14 tons

The *Star* estimates the concentration as worth over $3 75 per pound. This is manifestly an exaggeration, as the Silver King is the only mine concentrating ore and shipping to San Francisco. At one time the concentration were valued at $1 per pound, and later at but 33 cents. The 14 tons of bullion would be worth $448,000, and the 140 tons of ore would be fairly estimated at $150 per ton net (the grade being often quite high), a total of $21,000. Counting the concentration at 50 cents per pound, or $470,000, the total value of bullion and ore shipped to San Francisco from Pinal county would be:

Bullion (silver)	$448,000
Concentrations	470,000
Ore	21,000
Total	$939,000

And the ore embraced in the above, and excluding the concentration as being in the Silver King's report, and we have for Pinal county the following production in the calendar year 1880:

Silver King, per company's report	$505,642
Silver bullion, per railroad freight returns	448 000
Silver ore, per railroad freight returns	21,000
Miscellaneous mines (various sources)	149,738
Golden Eagle mill (gold)	80,000
Other sources, estimated (gold and silver)	200,000
Total	$1,404,380

The Globe City *Chronicle* publishes the following about the Globe district: "There are over 20 organized companies in the district, and of these the following have mills: McMorris and Mexican, 10 stamps running; Golden Eagle, 10 stamps, starts this month; Champion, 10 stamps running; Stonewall Jackson, 3 stamps running irregularly; Isabella, 5 stamps, starts again this month; Silver Nugget, 6 stamps running; Townsend, 5 stamps, starts up this month; Silver Era, 5 stamps, under repairs; Miami, 10 stamps, in litigation; Irene, 10 stamps, starts this fall; Mineral Creek, 5 stamps, starts this fall; McMillen, 3 stamps; Wheatfields, 5 stamps. It is the intention to have all of these mills in full running this fall, and as there is in the several mines a large amount of milling ore in sight, the result will be a long and steady output of bullion. There is also a company now being organized to build a narrow-gauge railroad to Salt river (20 miles), and there erect a large mill to run by water power. The company propose to contract for the large quantities of low-grade ore in sight in our mines and reduce them at from $9 to $10.

"Since the organization of the district there has been shipped to San Francisco and other places a considerable quantity of very high-grade ore. A ton of it was exhibited at San Francisco several years ago, which sold for over $20,000. It is difficult to get on the exact data as to the amount shipped, but from careful estimates we are sure its value was over $500,000.

"From our own knowledge, and after careful inquiry, we find that the total amount of bullion openly shipped from the district up to date is $460,000, and this is only the beginning. With all our mills going we will start this fall with a month'ly bullion production of at least $25,000."

Pima County.

Pima county is the most populous and prosperous portion of the Territory. Its county seat is Tucson, having at the close of 1880 a population of over 60,000. The county embraces the famous Tombstone and Harshaw districts, the Patagonia, Brushe, San Xavier, Oro, Blanco, Arivaca, Holland, Washton, Dos Cabezas, Dragoon, Washington, and other districts. It includes a large proportion of reduction works, mills and furnaces, and it produced more than the balance of the Territory during 1880. According to the reports of mining and milling companies and estimates made by the local press, the production as given in the local press was as follows:

	Silver bullion.
The Tombstone mills, Jan. 1 to Nov 30, 1880.	$806,249.02
The Tombstone mills (estimated), Dec. 1 to Dec. 31, 1880	107,194.28
Corbin mill, January to March, 1880*	36,000.00
Contention mill (Western Co.) silver bullion:	
Jan. 1 to Nov. 30, 1880	1,335 000.00
Dec. 1 to Dec. 30 (estimated)	165,000.00
Boston and Arizona reduction works, running July (part of the year)	46,624.98
Sunset mill (part of the year)	22,500.00
Harshaw mill (Hermosa mine), from Aug. 20 to Dec. 31	365,654.49
Holland sutter (trial runs)	20,000.00
Placer gold, Pima Co. (estimated)	18,000.00
From all other sources, as estimated by the *Citizen*, Jan. 1, 1881	100,000.00
Net yield Copper Queen (copper bullion), for four months ending Dec. 31, 1880	300,000.00
Total	$3,322,222.77

For the fiscal year 1879–80 the receipts of ore and bullion from Pima county, as reported for this Bureau, were as follows: Gold, $78,813; silver, $592,061.

The following details are taken from the *Citizen*, Jan. 1, 1881:

"The Tombstone M. & M. Co. submits the following report:

Value of bullion or silver bars produced from Jan. 1 to Nov. 30, 1880	$800,249.02
Value of bullion or silver bars produced from Dec. 1, 1880, to Jan. 1, 1881 (estimated)	107,194.28
Total for the year	$913,443.30

"Depth of shaft sunk during the year (5 shafts), 1,100 ft.

"Drifts—number of feet run during the year, 3,000.

"The Corbin mill was sold to the Tombstone Co. last March, after a short run, which yielded $36,000. There has been 150 ft. of shafts sunk on mines owned by the Corbin Co., and 100 ft. of drifts run. After the transfer above referred to, the yield from the Corbin mill is included in the Tombstone report.

"The Boston and Arizona reduction works report the shipment of bullion valued at $46,624.98. This was from 780 tons of ore crushed, and shows an average yield of nearly $60 per ton.

"The Sunset mill, under date of the 17th Dec., 1880, reported producing 10 bars of bullion from a short run, but failed to place a valuation upon the bars. The silver bars produced by the Tombstone mills usually run from $2,000 to $2,500. Taking it for granted that the Sunset bars were about the average, or, say, $2,250, we have, as the result of the Sunset, $22,500."

The bullion produced by the Contention mill is estimated at (for nine months) $1,200,000, as follows:

Value of silver bars produced from April to Nov. 30, 1880	$1,135,000
Estimated value of silver bars produced for the month ending Dec. 31, 1880 (estimated)	165,000
Total	$1,300,000

Of mines in the most southerly portion of the county, the *Citizen* has the following:

"The Harshaw Co. started up on the 20th day of August last; consequently, the result following is for but little more than four months.

Value of bullion or silver bars produced from Aug 20 to Nov. 30, 1880	$275,654.49
Value of bullion or silver bars produced from Nov. 30 to Dec 31, 1880 (estimated)	90,000.00
Total for the year	$365,654.49

"The smelter for the Holland mine has not fairly started up, though one or two successful runs have been made. The question of successfully treating these ores is now settled to the satisfaction of all concerned, and regular shipments of bullion will begin with the new year. Value of bullion produced so far, $20,000.

"The Copper Queen (at Bisbee, Mule Pass mountains) smelter started up the 1st of Sept. last, and with the exception of three days, has run continually ever since. The daily average yield of copper from this mine is 13,000 lbs., and as the smelter will have been in operation just 120 days, the total yield will be 1,560,000 lbs., which is worth 18 cents per pound in Baltimore, or $380,000, about $300,000 of which is net at the smelter.

RECAPITULATION.

Yield of the Tombstone Co.'s mills	$913,443.30
Yield of the Corbin mill	36,000.00
Yield of the Contention mill for nine months	1,200,000.00
Yield of the Harshaw mill for four months	365,654.49
Net yield of the Copper Queen for four months	300,000.00
Yield of the Boston and Arizona reduction works	36,624.98
Yield of the Sunset mill (a short run)	22,500.00
Yield of the Holland (trial runs)	20,000.00
Placer gold produced in Pima Co. during the year	18,000.00
Total value of gold, silver and copper produced in Pima Co. for the year ending Dec. 31, 1880	$2,912,222.77
Amount of silver bars and bullion produced from all other sources, including the Evans mill, the old Ostrich mill, the Derre mill, the Wetherill mill, the San Xavier smelter, and arastras operated within the county	100,000.00
Making the grand total produced in Pima Co. from all sources	$3,012,222.77

"There are six other mills in Pima county now ready to begin operations, and while we deem the above a good showing for what may be considered our first year's operations, we may safely calculate on more than doubling the above amount in the coming year.

"The actual yield of the Contention (now known as the Western) mine, as officially reported to the *Bulletin* by the secretary, D. C. Bates, is $1,214,055, that being the face value of the bars as shipped. The proportions of gold and silver are as follows:

Gold	$224,448
Silver	989,607
Total	$1,214,055

The Tucson *Star* of the same date gives the following, which differs somewhat from the above:

"The bullion production for mills of the Tombstone Co., Western, Sunset, Boston and Arizona, in the Tombstone district, and adds that of the Harshaw mill, in the district so named, with scattering sources, making a total of $2,678,930.55."

To this the *Star* adds as follows: "The placer gold product is estimated at $18,000; copper produced by the Copper Queen, 1,700,000 lbs.; net values at the mines, $323 000; making a grand total of $3,019,530.55 of bullion produced during the year. The T. M. & M. Co., and Corbin mill have been in operation since Jan. 1, 1880. The Contention started up in the latter part of April, the Harshaw, Aug. 20th; the Boston, Sunset, and other mills have run but a short time, and at intervals. The Copper Queen smelter commenced operations Aug. 20th. The San Xavier and Holland smelters have been experimenting as to the best method of treatment of ores, and are now prepared to produce good results. * * * There are 11 quartz mills, with 164 stamps; four more are under course of construction, with a total of 50 stamps, which will be completed during next month, and which, added to the former, gives 214 stamps, and will, in a short time, be working on ore. There are three smelters, with a total smelting capacity of 80 tons per day."

Yavapai County.

Yavapai county, in which is the Territorial capital, Prescott, shows quite a revival of mining industry. There is little data on which to base returns for the first half of the current fiscal year, but without question the bullion production has largely increased. For the fiscal year 1879–80 the following returns are made from San Francisco:

Gold	$3,374
Silver	251,399
Total	$254,773

Tip-Top, the largest producer in this county, returns as mill product for the calendar year 1880, $124,000.

The mining districts around Prescott are those in which the increase of activity and production would most assuredly be first made manifest. The production for the first six months of the current fiscal year will be underestimated, in a round sum, at $200,000, making a total for the 18 months under consideration of $454,773. The last calendar year's product can be safely estimated at $270,000.

Yuma County.

Yuma county has recently developed increased activity, especially to the south and east of Yuma City. Castle Dome district, on the Colorado river, and north of the railroad about 30 miles, has yielded in smelting ores shipped to the Selby works at San Francisco, during the calendar year, about $3,000 monthly, or $36,000.

Silver district, 50 miles south and east of Fort Yuma, is developing a dozen promising mines, of which the Silent is reported most favorably. A yield of $50,000 is reported in a local paper, but no authentication has been obtained. For the fiscal year 1879–80, only $1,800 in silver bullion is reported. Yuma county may be credited, however, for the calendar year, with a production to be estimated at $60,000.

Taking, then, the calendar year 1880 and grouping the careful estimates given, the following is the result obtained, in round numbers:

COUNTIES.	Gold.	Silver.	Total.
Maricopa	$100,000	$280,000	$380,000
Mohave	20,000	210,000	330,000
Pima	18,000	3,304,222	3,322,222
Pinal	80,000	1,324,379	1,404 379
Yavapai	5,000	265,000	270,000
Yuma	.....	60,000	60,000
Total	$223,000	$5,433,601	$5,566,601

That the foregoing estimates are not extravagant can be seen by the fact that in two counties alone, Pima and Pinal, over seven-tenths of their total production for 1880, amounting in all to at least $4,726,601, is embraced within the last half of the calendar year. It would be impossible to create so great a local activity as the figures exhibit without all other portions of the Territory feeling it, hence it is certain the estimate is a moderate one. The local press are claiming a total production of at least $7,000,000. With the progress now made and the increasing rapid development, it is not at all unreasonable to anticipate a total production for the coming fiscal year of from $8,000,000 to $10,000,000. The increase of reduction works is very great. Pima county had on the 1st of Jan., 1881, 11 quartz mills, with 164 stamps, in operation. It also had three smelting works, with a daily capacity of 70 tons. Several other mills and furnaces were on the point of starting at the date named. By the end of the year the stamp mills and furnaces will be doubled in number and capacity.

Pinal and Maricopa counties had on the 1st of Jan., in Pioneer district, one concentrating mill and two others with 30 stamps. The Vulture, Tiger, and the Wickenberg custome mill have 110 stamps in all. Pinal county has in Globe district, at Mineral Creek and Richmond Basin, 13 different mills, dropping in all about 90 stamps; Yavapai county about 45 stamps in operation, and Mohave county 30 stamps, while Yuma is reported as running 20 stamps, making 490 stamps in all and a half dozen furnaces, besides numerous arastras. At the end of 1879, there were not over 50 stamps in operation, and not a single furnace running.

The annexed tables give all the figures attainable at San Francisco for 1879–80.

Bullion Production of Some of the Mines of Arizona, as Reported to and Published in the "Mining Record," of New York.

MINE.	Calendar year 1879.	Jan. 1 to June 30, 1880	Fiscal year 1880	Calendar year 1880.
Contention or Western	.....	$437,754	$437,754	$1,048,986
Head Center	.....	17,000	17,000	17,000
Harshaw	.....	.....	.....	333,000
Hackberry	$18,608	.....	9,304	.....
Silver Nugget	.....	.....	.....	19,272
Silver King	288,300	180,000	324,150	454,022
Stonewall Jackson	28,800	4,000	18,400	28,500
Tombstone	.....	268,619	268,019	782 118
Tiger	98 900	17,000	66,450	17,000
Tip-Top	418,800	.....	209,400	124,000
Total	$353,408	$924,372	$1,351,077	$2,830,298

*Since March the product has been consolidated with the Gird mill. Both now belong to Tombstone.

Summary of Bullion Production in Arizona for the Fiscal Year 1879-80, by Counties.

COUNTIES.	Gold.	Silver.	Total.
Maricopa and Pinal	$90,662	$266,543	$357,205
Mohave	17,350	178,329	195,679
Pima	78,813	513,248	592,061
Yavapai	3,374	251,399	254,773
Yuma		1,800	1,800
	$190,199	$1,211,319	$1,401,518
Unreported sources	200,000	800,000	1,000,000
Total	$390,199	$2,011,319	$2,401,518

Two hundred thousand dollars gold and $800,000 silver are added to thie Territory es from unreported sources, to cover the known yield of two mines refnsing the information.

Interference of Telegraph Wires.

The multiplication of telegraph wires, especiallly in cities, is ceusiog much tronhle and no little danger as well, especielly where the large electric light wires are interwoven with the nnmerons telegrsphic and telephonic linee. When one wire comes into nesr contact with another, the electricity passes and repasses in small amonnts from one wire to the other nntil neither is of any service in conveying sigoals or sounds. This is is specially the csse in wet weether, particnlsrly if a few spider webs, or other small connections are made hetween the wires. The process of indnction is often made audible, especially in the demp and stillness of night, and mey he recognized hy the peculiar humming which is heard on pnt'ing a telephone receiver to the car. When this ioduction process is nnusnslly strong it often makes itself knowo hy a violent and prolonged ringing of telephone hells.

There are also many other dangers, which experience will in time teach us to avoid. If a heavy electric light wire should drop npon a telephone wire, and swaying hy the ection of the wind, should cut through the insulation of the former a heevy current of electricity would at once find its way into some telephone box with dengerons effect. An operator might receive a severe or possibly e fatel shock; or a fire might he sterted in some obscure corner.

A peculiar case occnrred a few evenings since at the Risdon Iron Works in this city, where the electric light is nsed. An electric fleme was seen to hnrst snddenly from one of the halices, or coils, similer to thet seen in the lamps. The cnrrent was at once ont off to avoid danger or demage. An occnrrence of the kind in any nnobserved place might have resnlted in a serions conflegretion. The fleme was prohably censed hy a smell splinter of iron getting into the coil and wearing or rusting off the insnlation hetween two portions of the wire, that estehlishing a cross current, which manifested itself as ahove.

We mention these facts not to discourege electric lighting, or the nse of electricity in eny way, hut simply to diffuse some usefnl informetion in regerd to the proper cere to he observed in its nse. Electricity is destined, et an early day, to hecome an important egency—not only in heavy mechenical and manufactnring operations, hnt also in the every-day life of our cities generally.

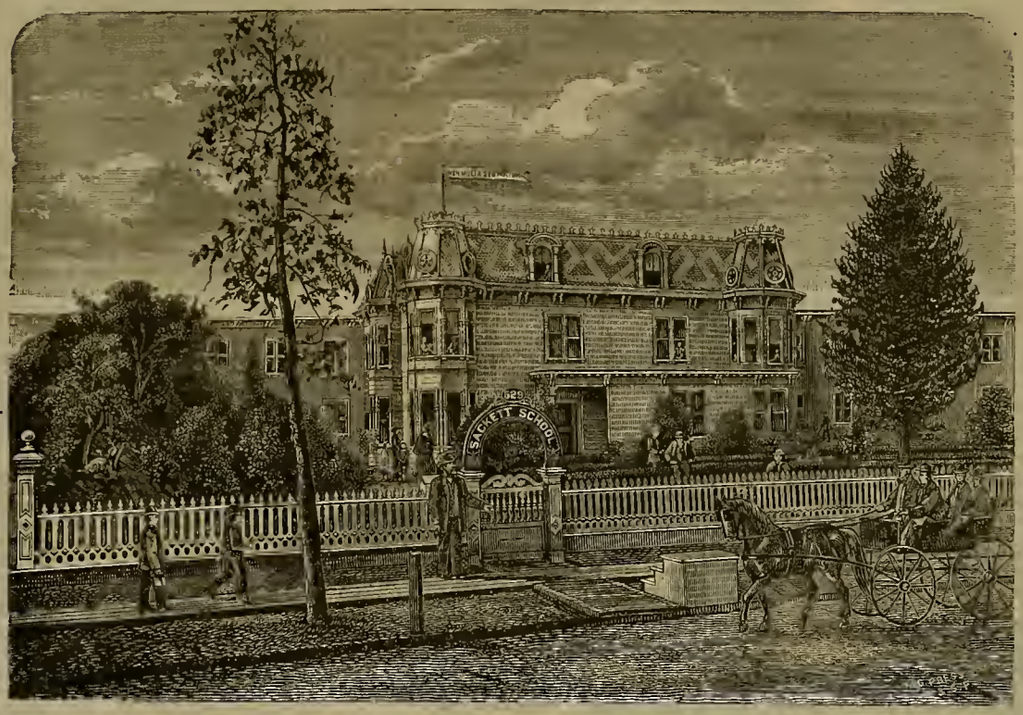
The only wey to avoid eccidents from electric wires and lights, is for those employing them to he thoioughly informed in regard to their use, and to see to it that all wires needing protection are thoroughly insulated, and otherwise secnred from the possihility of denger.

A Big Sale of Mines.—A Mr. Rohinson, a mining expert of some note throughout the Stete, was here last week and negotiated for the purchase of severel of the mines at Heyden Hill, in fact, nearly all of them, for a London compeny. Tbe principel of the mines is the Juniper, for which the sum of $500,000 is to he paid; the other mines, some seven or eight in nnmher, are hargained for at $115,000, making a grand total of $615,000. Mr. Rohinson assured ns that the money would be in San Francisco and the hargains closed hy Christmes. He expresses the helief that they ere the hest mines in the world, for the reasons thet the ore is the richest and hecanse there is so little hase metal in it. He penned a little dirt from one of the mines, and said a ton of such dirt was worth $100,000, and found plenty of dirt thet was worth from $1 to $4 a pound. If these stetemeots are not exaggerated, the company pnrchesing these mines have the finest mioiog property in the world.—*Adin (Modoc County) Argus.*

An Immense Planer.—The Betts mechine company, machine tool huilders, of Wilmington, Del., heve just completed and are now shipping one of the largest machine tools ever constrncted. It is a huge mechine, capahle of planing a piece of iron or other metel 10 ft. wide, 10 ft. high and 24 ft. long, and so arranged that four cutting tools may operate on the work at one time—two of these are on the cross-head, and one on each upright. The hed-plate is a massive cesting, 6 ft. wide and nearly 40 ft. long, weighing nearly 40,000 lbs.; each upright weighs ahout 10,000 lbs., and the total weight of the tool is 120,000 lbs. It is hnilt on order for one of the lerge engineering works in the West, and is the eighth machine that will plene 10 ft. sqnare thet has gone out from these works, though they are not ell so long as this one.

Patrick McGorrisk, a well-known prospector and discoverer of the Oro Blanco district, Arizona, died last week in Arizona,

The Sackett School, Oakland, Alameda County, California.



The Sackett Boarding School hes in a hrief time gained a leading position emong the meny private schools of Oaklend, which fact affords the hest possihle proof of snperior merit. The Principal, Mr. D. P. Seckett, has heen long and favorahly known there es a teacher and disciplinarian. The location of the school is convenient, healthful and attractive. The comfort and well-heing of the stndents is an especial feature of the domestic depertment, and the moral end physical training of the pupil is carefully condncted.

In their mentel training great prominence is given to the fundamental hranches which mnst enter solidly into all gennine edncation. This institntion is the yonngest of the many private schools across the hay, and has shown rare vigor and enterprise in many ways, and more particnlerly in providing the most competent teachers. D. P. Sackett, of Yale College, is the Principal; George W. Drew, A. M., of Yale College, is head master; Allen E. Jenvier, A. B., of Yale College, is in charge of the English Department; Mery K. Culhertson, State Normel School of New York, has charge of the department of Netural Science; end Mrs. George W. Drew has the department of Musio.

Twice hes the huilding (shown in the engraving) been enlarged and heautified until now it stends ont es one of the finest edncational ornements of the Athens of the Pacific. The grounds are as home-like and cheerful es those of any private residence, and one feels at once thet the young men who heve a school home there are comfortahly situeted. Yonng men from the interior would do well to send for catalogues, as speoial adventages are provided for them in the courses of instrnction.

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Arizona Cities and Towns.

Ws condsnss the following information about the cities and towns of Arizona from the pamphlet on the resonrces of Arizona.

Tucson,

Ths principal city in the Territory, stands on ths verge of a great mess, on ths east hank of the Santa Cruz river. The mesa is an extsnded plain, hounded hy short mountain ranges, between which the mess continues. Tucson is said to havs hsn estahlished asa Spsnish military station, to protect the Mission of San Xavier, ahout 1694. The town prssents ahout the sams appearance as ths Mexican towns of New Mexico, heing mostly huilt of sun-dried hricks or adohes. Since the completion of the Southern Pacific railroad and the hnilding of a fine hotsl snd depot hy the compsny, the place has taken a new impetus. We see some fine residences and puhlic huildings. The Catholic cathedral, huilt of brick and adohes, is the most imposing structure in the city. Thsre are Methodist, Presbyterian and Baptist churches; Odd Fellows, Masons, Knights of Pythias, Good Templars and Workmsn; two hanks and numerons hotels; thrss daily and weekly papers—Arizona *Star*, Arizona *Journal*, Arizona *Citizen*, and a Spanish Mexicsn paper—*El Fronterizo*. There are suburhan retreats, a silver lake, a heautiful drive down the valley of Santa Cruz to the old Mission of San Xavier, miles of dusty streets and adohe walls. Groves line the river, and mesquite trees are scattered over the mesa.

Tombstone,

The principal mining town in Arizona, the county seat of Cochise county, stands on the mesa toward the south end of the Dragoon mountains. Its streets are enlivened hy nearly 7,000 souls. It is located 70 miles southeast of Tucson, and 28 miles south of Bsnson, on the S. P. R. R., and on the direct line of the Atchison, Topeka and Santa Fe railroad to Guaymas. A hranch road is at present heing constructed to connect it with the Southern Pacific at Bsnson. The road is at present completed to within ahont 14 miles of the city. The first house was erected here in 1879, since which time it has grown as if by magic. It is hnilt of wood and adohes. There are many fine husiness houses, a large thester, four hotels, two hanks and many heautiful residences.

It contains four churches—Methodist, Presbyterian, Episcopal and Catholic—hesides the various Ordsrs are well represented, puhlic and private schools, with an attendance of ahout 400.

It is the center of the richest mining section in the Territory.

Prescott,

The capital of Arizona, is located in a little valley, partially surrounded hy the Sierra Prieta or Black mountains. The low hills are covered with timher aud grass. The town is well laid out with hroad streets. The courthouse is a handsome brick structure, with mansard roof. Unlike many of the Arizona towns, the huildings are of hrick, wood and stone. It has many fine stores and residences, some of the private residences heing very handsome. Its surronndings are heautiful and the climate mild and healthy. There are many interesting remains of ancient Indian towns in the vicinity, and it was evidently the seat of the first attsmpts at civilizstion in the Territory. All the Orders and churches are well represented. There is one hank, two good hotsls, two newspapers, the *Arizona Miner* and *Arizona Democrat*. Its elevation ahove the sea is 5,500 ft., and the population 2,500.

Phœnix.

In the valley of the Salt river (on the hanks of the famous stream up which all defeated politicians are supposed to travel), is 28 miles from the Southern Pacific railroad, at Maricopa station. Canals carry the water over the vallsy, which is fertile. The valley, formerly a harren desert until the first settlers in 1870 changed the face of nature, making it at this time, hlossom as the rose.

The streets of the town are wide, and are shaded with large cottonwood trees. There are clsnrches and Lodges of the popular Orders. Its population is ahout 2,000.

Globe.

The shire town of Gila county, is located on Pinal creek, a small hranch of the Salt river, 120 miles from Wilcox, on the Southern Pacific, or 90 miles from Florence, to the northeastward, in the midst of a mineral region, with a population of 1,500, and is improving. Two papers are published here, which represent the interests of the country—the *Chronicle* and *Silver Belt*.

Florence,

The largest town in Pinal county, 25 miles northeast of Casa Grande, on the S. P. R. R., in the valley of the Gila, is one of the most attractive towns in Arizona. It stands amid groves of cottonwood and other trees; the water heing led in small canals along the streets, and the dooryards are fresh with hlooming flowers. It has hut a slight elevatiou above the sea, and is consequently warm in summer. The buildings are mostly adohes. It is the center of the hest farming section found along the Gila, and has a population of perhaps 1,000. Mines of more or less value exist in the surrounding mountains.

Mineral Park,

An adobs-built town on the westsrn slope of the Cerbat mountains, occupies tbe center of a mineral region, with a population of 500. It is 10 milss from the railroad.

Pinal,

Locsted on Queen creek, depends on the Silver King mine, the mill of the company hsing located here. It has a population of 600, and is prosperons. The houses are of wood and stone, a light calcareous tufa found in the immediats vicinity.

Harshaw,

A wood-built town, 70 miles southwest of Tucson, with which and Sonora its trade is dons, has a population of 600. The hills surrounding ths town are covsrsd with timhsr and grsss. The mill of the Harmosa M. Co. is locatsd hers.

Silver King,

At the cslebrated mine of the ahovs name, has a population of 300, who either work in the mine, or depend on it for husinsss. It is five miles from ths town of Pinal.

Charlestown,

Ten miles from Tombstone, on the San Pedro river, where ars located the mills and rsduction works of the Tombstone Mill and Mining Co., is a small town, of perhaps 300 inhahitants. A station is now bsing built at this place, which the railroad will reach in a few days.

Galeville,

In the Chiricahna mountains, 20 miles from the Southern Pacific railroad, and near the line of New Mexico, stands on the oak-covered mountain slope. Started in 1880, it has a population of 400. Water, wood and fine feed ahundant.

St. Johns,

County seat of Apache county, on the hanks of the Little Colorado, near the New Mexican line, is the center of a farming and good grazing conntry. The town has a popnlation of 700, mostly Mexicans, and is on the line of the Atlantic and Pacific railroad.

Safford,

Graham county, is the center of a farming and grazing country. Population 300.

Physical Geography of New Mexico.

New Mexico is one of the largest of the Territories. It is situated hetwesn the 31st and 37th parallels of north latitnde, and the 103° and 109° of west longitnde; has a length of from 350 to 393 miles, and a breadth of 335 miles, and contains 121,000 sqnare miles. It is hounded north by Colorado, sonth by Texas and Mexico, west by Arizona, and east by Texss and Indian Territory. The general surfaoe consists of high, level plateaus, traversed hy ranges of mountains, hetween which are many wide and fertils valleys, while occasional isolatsd peaks of great hight occur.

The chief river is the Rio Grande del Norte, which flows south throngh the center. The Pecos flows south through the eastern division to join the Rio Grande in Texas, and these two rivers receive many small tributaries. The northeast is drained hy the Canadian and the northwest by the San Jusn river; while the Gila and Chiquito Colorado have their origin in the southwest. The valley of the Rio Grande has an elevation of hetween 5,000 and 6,000 ft. near the northern houndary, and 3,000 ft. at El Paso. On each side of the valleys of the Rio Grande and Pecos, the mountains have a general altitude of 6,000 to 8,000 ft., while some rise far ahove the snow line, which in this latitnde is situated at an elevation of ahout 10,000 ft. Most of the mountains and streams have a general direction north and south. The Rocky mountains are here divided into two ranges, of which the easteru contains the highest peaks, and extends to within a few miles of Santa Fe. South of this range, a lofty platean extends hetween the Rio Grande and the Pecos, hroken, however, hy nnmerous smaller ranges. In the west, the great range of the Sierra Madre extends into Mexico. The country wsst of this is less known than the eastern region, hut is helieved to he fertile, and to contain great mineral wealth, as yet entirely undeveloped. It consists of numerous and extensive table lands or mesas, with detached ranges of mountains enclosing many heautiful valleys. In the extreme southeast is the Llano Estacado, or Staked Plain, which covers many thousand square miles, and extends a considerahle distanoe into Texas. This consists of an elevated tract, destitute of wood, and almost entirely unproductive. With this exception, the land, where susceptihle of irrigation, is generally valuahle for agriculture and grazing. There are no fresh watsr lakes of any importance, hut salt lakes, or salinas, are ahundant, particularly hetween the Rio Grande and the Pecos, south of Santa Fe, and from these, large supplies of salt are obtained for the use of the Territory, and adjacent provinces of Mexico.

Climate.

The great differences in latitnde and elevation give rise to wide variations in the climate of the Territory. The atmosphere is clear and dry, and pulmonary and miasmatic complaints are scarcely known, the proportion of deaths from consumption heing smaller than in any State or Territory, with the exception of Arizona. In the mountains the winters are sometimes severe; on the plateaus and in the river valleys, especially of the south, they are remarkahly mild, the temperature seldom falling helow the freezing point. In this locality the rainy ssason is in July and August. The annual precipitation varies from 10 to 30 inches, according to location. The mean annual temperature at Santa Fe, at an elevation of nearly 7,000 ft., is 50° Fahr.; that of spring, 49°, summer, 70°, autumn, 50°, wintsr, 31° Fahr. Ths highest temperature recorded was 88°, the lowsst, 5°. The summsrs are long and warm, hut extreme heat is rarely experienced, owing to the slevated position of tbe oountry and the frequent hrsezes.

[Advertisement].

More About Water Supply.

Ths demand on ns for information has recently hsome so grsat that we are unahle to reply to the letters daily recsived, and we have thus found it nscsssary to puhlish this additional circular, and to provide the means for meeting the dsmands of those who dssire wells for domestic, stock and othsr purposes. As a large dsmand for the *points* used in the construction of the driven wells has rscently arissn hers, it has occurred to us that many of them are heing put down without authority or license. *The purchase of the point does not give the legal right to put down and use a well.* The driven well is the invention of Col. Nslson W. Gresn, of New York, and is secursd to him by letters patent No. 73,425, No. 4,372 (re-issued) and No. 218,875. These patsnts have heen exhaustively litigated in the U. S. Circuit Courts, in the States of New York, New Jersey, Massachusstts, Iowa and Minnesota, and in every instance decided in favor of Col. Green. Because of the immensa value and utility of these inventions, combinations of large means and influence have hsen made at different times to defeat the collection of royalties and licenses. In one of these csses reported in 13th Blatchford, page 208, 19 days were occupied hy the most ahle counsel in the argumeut, and over 3,000 printed pages of evidence and hriefs were hefore the court on hehalf of the plaintiffs alone, and the expenses of the suit were over $100,000. The opinion was prepared hy Judge Benedict, and completely estahlished Col. Grsen's claim at every point. Judges Dillon, Nelson and Blatchford have all rendered opinions to the same effsct; and in a hundred other cases, arising out of collateral matters, have ths title and right of Col. Green heen most fully sustained. Our object in making these statements is to

Caution

All persons against the use of the driven well without authority, and to say that no person or persons have the legal right to put down or uss a driven well in California without authority or license from us. We are the exclusive agent and attorneys of Col. Green, for the States and Territories west of the Rocky Mountains, and intend to enforce and protect his rights, as well as onr own, to the uses and henefits of these patents. Should any person offer to put down a drivsn well for you, request him to exhibit his anthority from ns, and if he is not ahle to do this, you may rest assured that you will he required, soonsr or later, to pay licsnse to us.

To answer the constantly increasing demand for information, to guard against.

Fraud and Imposition,

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To kesp on hand all materials necessary for the construction of these wells, which will he shipped hy them on receipt of the price statsd. Upon the receipt of such order by them, or us as stated below, a full aad minute letter of instructions as to the manner of constructing these wells, will also he sent, so that anyone of ordiuary sense can put them down as perfectly as those especially engaged in the business. This letter of instructions—*together with the license*—will he sent with the goods. The articles sent will include everything necessary to a complete and perfect well, and also a pump of sufficient capacity to deliver 900 gallons of water per hour. Without this letter of instructions, and careful attention to the directious it contains, it is more than likely that the attempt to put down a satisfactory well would fail, and thns the goods furnished would prove a partial loss. In adopting these meaus of putting the driven well within the reach of everyone, the expenses of employing an expert, so called, are avoided, and ths cost of the well is therehy so reduced as to he within the reach of everyone. One of these wells can he easily constructed hy two men in two days—usually in ons day—to a depth of 50 ft.

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Material for wells not more than 40 ft. in depth, including pump and license, will he sent for $45. Wels of 50 ft. will he supplied for $50, and for each foot over 50 ft., at 40 cts. per foot—to be sent, *in all cases*, hefore the goods are shipped.

In sending your order, it will he of advantage also to send us as full and accurate a description of the proposed location of the well, the distance—or supposed distance—of the water heneath the surface, the nature of the soil from the surface down—so far as known, the thickness of the differsnt strats, and any othsr facts likely to he of advantags to you and us in writing our letter of instrnctions. In any case whsre, from the statement of facts, we ars satisfied watsr cannot he ohtained in satisfactory supply, ws shall so state, and will immediatsly return your money.

We refer, by permission, to: Chas. Millsr, Esq., of Huntington, Hopkins & Co., junction of Bush and Market streets; Lsmhert & Gresn, manufacturers of H. & L. axle grease, 144 Natoma street; M. P. Holmes, carriage manufactory, 327 and 329 Sutter street; Judge Robert Thompson, 76 Montgomsry Block; R. H. McDonald, Presidsnt of the Pacific Bank. All of San Francisco.

For circulars and other information, address Babcock, Howard & Co., 40 Merchants' Exchange, S. F., Cal.

Note.—No lettsr of instrnctions will hs ssnt, except it is sent with the goods.

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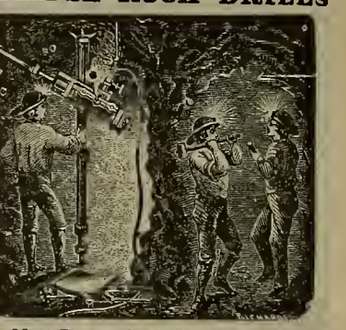

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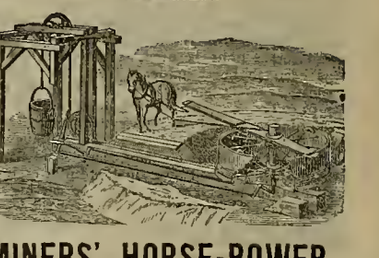

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The Big Bend Tunnel.

(CONTINUED FROM PAGE 400.)

gan, of Oaklnnd, Cal., and Major Frank McLanghlin, of New York. These gentlemen took hold of the project in a characteristio, energetic way, nud had it exnmined hy engineere and mining experts. Then they went to work nnd took np somo 13 miles of the river hed and got it coverod hy U. S. patent. It happened to he on unsurveyed Government lande, and so could be taken up without consideration of the legnl subdivisions. This patent, hy the way, ie the largest ever issued hy the U. S. Governmont, and the snrveye above cost over $4,000. Hon. R. V. Pierce, of Buffalo, and Waldermnn Allstrom, of Chicago, also associnted tbomselves with the gentlemen mentioned.

Of couree, a project with the appnrent hrilliant proepecte poseeeeed hy this could not etend long in the market, and it has been stocked and sold, and preliminary work hegun. Roads and honses are heing built, and it is intendod to hegin work on two fnces of the tnnnel itself in April next.

The north fork of the Feather rivor rises at Lassen's peak, where the melted enow percolates throngh the fissnres in the lavn below the cap, and gush forth in one immenee body, creating, as it were, a river instnntaneously, at the head of Big Meadowe. From thie place it continues its couree throngh Laesen, Plnmae and Butte-counties, a distance of 100 miles, nntil it renchee tbe point selected for the bead of the tnnnel.

The couree of the river at Big Bend is shown in the accompanying mep. The peninenla of Big Bend ie composed of high mountain land with precipitous hanke to the river. The area is about 11 eqnare milee, and length of the river to he drained is 12 milee.

The following facts concerning the project we condense from the report of Jno. D. Barry, the engineer who exnmined it for the owners:

The tunnel begine nearly half a mile above Whisky Bar, at a plnce where the river is deeply encaved hetween the henks, and where the stream has very little fall. It ie proposed to estahlieh the hottom of the tnnnel four ft. helow the lowest portion of the stream, in order to give the impetus to the watere, taking a greater velocity than they had in the etream, and in order to obtain at once the required depth of water in the tunnel which it is provided to carry on its wbole conrse.

On the accompanying longitudinal section are shown the different natnree of ground that will he encountered in the driving of the tunnel. These rocke are claeeed provisionally only, as also the width of the different strata. It ie impossihle to give positive namee to rocke in California without cutting microscopic sections, and eometimes chemical analysis is aleo neceseary.

Thie Big Bend tnnnel will he 11,600 ft. long, 25½ ft. wide, 21½ ft. high, and the excavations will cost ahout $4 per cnhic yard. At the entrance of the tnnnel will he a permanent dam across and up to the level of the hed of the stream. On thie csn be erected a dam, on the Bayot plan, as used in the Cher and Loire rivers, that can he thrown down and erected again in n short time, or a temporary construction can he built each year.

One of the engravinge repreeents a cross section of the river hed. *A* is a line ehowing the highest floods (extnrordinary years); width, 245 ft. *B* showe highest floode (ordinary years); width, 189 ft. *C* showe the level from June 1st to February. *D* showe the water level from July to Decemher. *E* shows the water line in Octoher, 1880. The diecharge of the river at the latter date wae estimated at 2,019 cnhic feet per eecond. The tunncl would he large enough to carry all the water of the river, nnder ordinary circnmstances, for enough monthe in the year to allow of very profitable work.

Mr. Barry makes two estimates of cost—one, for 155,037 cnbic yards, at $4, which, with machinery, compreesors, tools, huildings, roads, weirs, sluice gatee, ventilating hore holes, engineering expensee, etc., amounts to $800,000; the other, with the same expenses, except that 207,230 cnhic yards are to he excavated, amounts to $1,000,000. Some of the water may he utilized for irrigating pnrposes.

Mr. Barry eays that experienced miners who have heen in the neighhorhood since 1850, estimate the value of tbe gold in the river hed aronnd Big Bend at from $50,000,000 to $150,000,000.

Prof. Thomas Price, who reported on thie property for the owners recently, in answering the question as to the river containing sufficient gold to justify the expenditure, says: "I can only reply that, from the fact that this portion of the Feather river hae never heen worked eystematically, and that hoth helow and ahove it, wherever it has heen poseible to wash on the river, very remunerative results have heen obtained, notwithstanding that hut in few places has the hed of the river heen reached. Ahove the point of intended diversion of the river it is well known that the modern stream has intersected and cut out the gravel of the ancient etreame which were rich in gold, hesides which the tailings from the exteneive early placere, drifte and hydraulic mines have found lodgment in this stream, the freshets of each winter have carried away the debris, and to a conaiderahle extent the gold has concentrated here. Whenever it has heen possihle to wash on the Big Bend, as it is called, good results have heen obtained. A very large number of claims on the Feather river have paid well. I will mention a few that are conaidered good, as illustrations. The Cape claim was wingdemmed in 1856, nnd paid handsomely. The same portion of the river wae flnmed for a length of 3,300 ft. in 1857, at a cost of $120,000, and over $600,000 was obtained in 40 days. Somo days the product reached $21,000. The winter rains came on and carried all the improvemonts away. This claim is still rich, hut the extensive mining above has covered the bedrock with a large and thick deposit of gravel, and it is not worked on account of tho uncertainty of tho dry season heing long enongh to get ready in time for washing sufficiently long to enable profitable rcoults to he obtained. The Private compnny's clnim has the reputation of heing very rich, and at the Slote olnim it ie stated thet over $100 per pen of 30 lbs. of gravel was obtnined. The Ohio claim, immediately above the Slote claim, had the reputetion of heing very rich. The Sailor claim worked in two yenrs some 500 ft. on the river without reeching bedrock, the yearly profits heing $40,000.

Several other clnims hetween Oroville and the weet branch of tbe Feather river paid lnrgely. One Huhhard flumed 400 ft. of the Big Bend, near the mouth of the west branch of the Feather, roalizing, it is etated, over $40,000.

The Union Cape claim was flnmed nnd paid in one eeason $275,000. At every point, for a distance of 60 milee ahove the Big Bend, wherever the river has been washed, very profitahle resnlts have been produced. At the present time two portione of the river above the site of the proposed tunnel is heiug washed by 29 Chinamen, and it is claimed that they are extracting from $200 to $500 per day. In none of theee varione claims have they heen ahle to get down to the bed of the river, as the season ie too ehort; about 40 days is all the time they have, and some eeasone not over 10 daye, hefore the etreame commence to rise and carry away all the improvements.

All the hare in the Big Bend have the repntation of having paid well. It ie claimed that over $1,000,000 was taken from Toland har in the eeasons of 1856 and 1857, and it has been worked every year since. All the tributeriee of the North Fork have heen very rich.

"From the foregoing facts and well-known richness of tbe Feather river and many of its tributariee, wherever they have been worked, there ie every reason to helieve that the 12 milee owned hy your company containe a very large amount of gold. All that is necessary to render it availahle is to divert the waters from the stream, so ae to he able to work continuously for several months each season—a condition that is availahle only through this scheme."

Prof. Price thinke the feesihility of the tnnnel only a question of finance, and that all the water of the North Fork could he paesed through it in the fall and summer monthe. The tunnel may also he rendered availahle for saving considerable gold that may he carried into it from the gravel above ite mouth; so that really mnch of the river above the so-called Big Bend mey yield its valuahle gold. I see no reason why this enterpriee cannot he made a successful one, hoth from a practical and financial point of view. To carry it out only requires engineering skill, time and money.

This project is one that will he watched with interest, as when it is completed it will demonstrate facts of value to the mining community in this State. There may he, and doubtlese are, other localitiee where similar plane may he adopted, provided equnlly energetic men take hold of them.

An Extra Edition.

This number of the MINING AND SCIENTIFIC PRESS is devoted largely to the intereets of Arizona end New Mexico. The edition ie one of 32 pages, double the numher we usually print each week, and is quite fully illustrated.

Of course it is impossihle to give more than hrief notes of such extended areae as are comprised in these progressive Territories; yet we have in this number compiled a great deal of information ahout them. We sent a epecial corresponnent to Arizona to collate information for us, and the results of eome of hie work appear in this issue. Valuahle articlee for preservation and reference aleo appear. In a portion of the edition we puhlish a revised map of Arizona, showing the railroad lines, etc., and any of our old readere who may specially wish a copy of this map can have it by applying at thie office.

MR. THOS. A. EDISON, the talented yonng inventor, whose genius ie nndonhted by those who know him heet, continues his investigations and lahore in perfecting the electric light and its appliances. No one has contributed more to progress in thie direction than thie young man. We predict that it will not he long before he completely proves the success of hie invention, as it is not prohahle one of his great talents would persevere in schemes which are likely to prove futile. He hronght honor to the American name in the recent exhihition in Europe, and will further exalt it, we feel certain. Mr. Edison is turning his attention more particularly to a light for household purposes—something we really need more than street or puhlic lights. Mr. Edison will before long demonstrate the practicahility of his lights to the general puhlic, ae he hae already to many persons; hut he ie right in keeping hie business to himself until he is ready for work.

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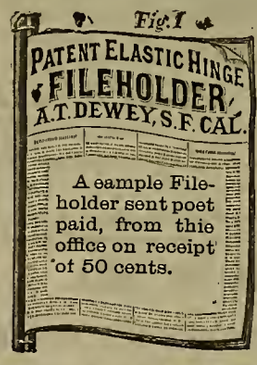
Fig. 1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N. B.—Mr. J. L. Boone, of the above firm, has been connected with the patent business for over 15 years, and devotes himself almost exclusively to patent litigation and kindred branches.

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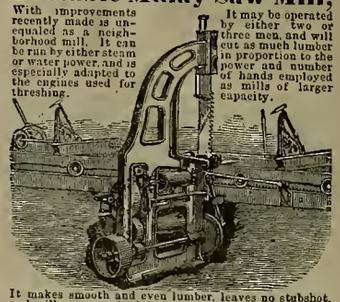

It may be operated by either two or three men, and will cut as much lumber in proportion to the power and number of hands employed as mills of larger capacity.

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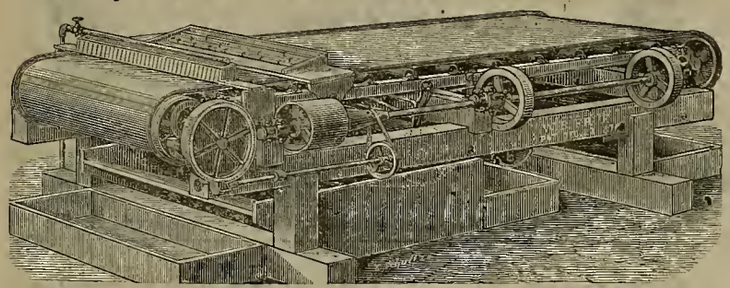

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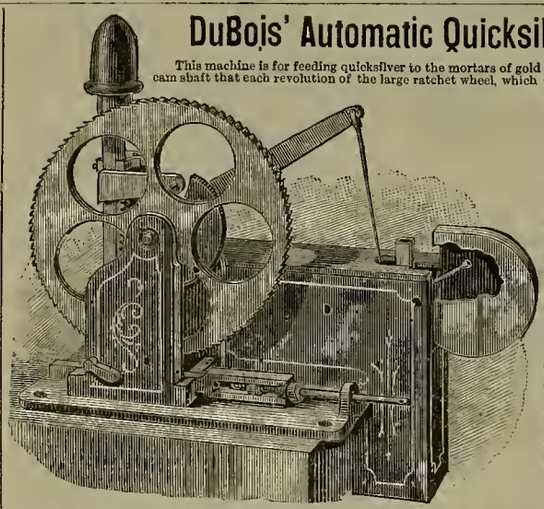

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.

A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.

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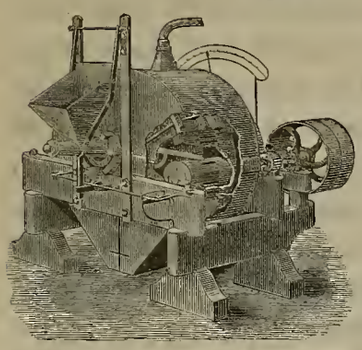

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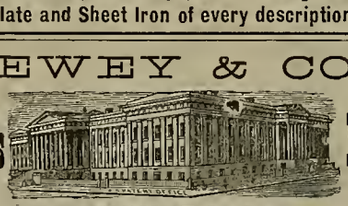

[ESTABLISHED 1860.]

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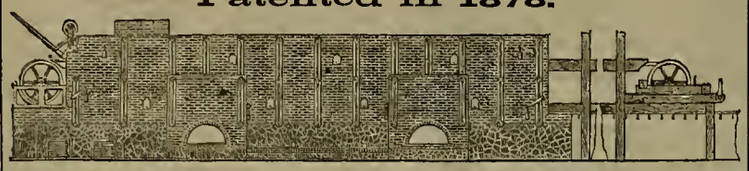
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This Furnace is Constructed with two SEPARATE HEARTHS, one for DESULPHURIZING and one for CHLORIDIZING the Ore.
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An endless chain carrying conveyors or scrapers passes continuously through over both hearths, going one way through one chamber and the other through the other chamber. By this means the ore is fed and discharged at the same end of the furnace.
A cheap Furnace to build and to run.
The process is essentially the same as the well-known Frsiberg process; but the mechanical devices applied to the furnace and the peculiarity of its construction enable the inventor to thoroughly desulphurize and chloridize the ore to a higher percentage than other furnaces, and with less cost for fuel and labor.
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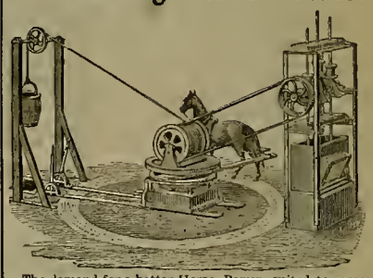
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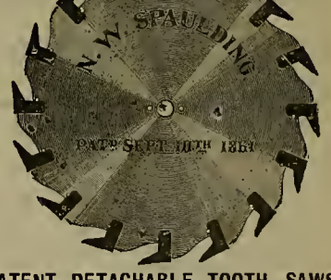

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Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

TIRE UPSETTER.—Chas. W. Eames, assignor of one-third to Aaron Bell and E. F. Crocker, all of Shasta, Cal. Dated Dec. 6, 1881. No. 250,510. The improvement in tire upsetters consists in the arrangement of a stationary arm and a movable arm, and bed piece, the former having pivoted thereto a clamping jaw, and the latter having a similar jaw pivoted to and moving with it, said jaws having corrugated cam heads, and being so pivoted that when forced together the clamping power is in proportion to the power exerted. The operating device is a lever, which draws back and forces the movable arm toward the other. The advantage of this device lies in its simplicity and effectiveness. Great force can be exerted to press the lever down, and in proportion to that force, the clamping power of the jaws is increased.

LIFTING JACKS.—George Caseres, Freestone, Sonoma county, Cal. Dated Dec. 6, 1881. No. 250,497. This invention relates to certain improvements in that class of liftiog jacks which are used to lift the axles of wagons; and it consists in such a construction as will render it readily adjustable, dispensing with some of the usual bolts, nuts and guides, and generally simplifying the whole device, whereby it is rendered cheap and yet efficient.

CULTIVATOR.—A. Evans and J. Draper, St. John, Colusa county, Cal. No. 250,512. Dated Dec. 6, 1881. This invention relates to that class of agricultural implements known as cultivators, and is one comprising two series of diverging independent arms having their forward ends each pivoted at or about the center of the next preceding one, the front central arm having a shank extending forward and secured to the shaft upon which it has vertical play. The combination is one which is very strong and effective.

Mining Debris in Congress.

The California Congressmen seem to be alive to the great interests involved in the vexed question of what to do with the debris from the hydraulic mines, and are bringing the matter before Congress in a way that will call the attention of the country to it. Once in Congress, the slickens question becomes a national one, and it is taken out of the influence of local prejudice. While it may not then be argued with the same knowledge of facts which it would be within the bonndaries of the State where the evil exists, it will nevertheless be considered more calmly and with greater deliberation.

Mr. Page has already introduced a bill, in the preamble of which he sums up the question briefly, showing what the evils are, and also showing the great importance of the mining industry and the harm being done to the agricultural industry.

The concluding paragraphs of the bill are:

WHEREAS, It is believed that the settlement of the grave issues which have arisen in the State of California, in relation to the physical features of that State and the location of the mines, is peculiarly under the province of the General Government, which has reaped such vast benefits from the mining interests in that State to harmonize these interests, which it is confidently stated by our most able scientists and engineers can be done by the construction of proper works, at the expense of the General Government; therefore,

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That the sum of $500,000 be, and the same is hereby, appropriated out of any money in the Treasury not otherwise appropriated, for the purpose of making such improvements or works, under the direction and supervision of the Secretary of War, as he may see fit, for the improvement of the Sacramento, Yuba, Feather and American rivers, and their tributaries, so as to protect them from overflow from the debris and the filling up of said rivers, and for the removal of deposits of debris that now impede navigation, and also to prevent the destruction of lands and property adjacent to said rivers, and to protect the harbor of San Francisco from further injury from said cause.

Mr. Berry has also introduced a bill, setting forth briefly the facts in the case, concluding as follows:

WHEREAS, Lieutenant Colonel of Engineers G. H. Mendell, U. S. A., after a careful examination, in pursuance of the act of Congress directing such examination, has reported to the War Department recommending immediate action by the General Government in the construction of stone dams in river canyons, which is believed by eminent engineers to be the only feasible remedy to arrest millions of tons of debris now in the upper river channels, and in its way to the levels below; and

WHEREAS, It is the duty of the General Government to protect from injury and to improve the navigable waters of the country in the interest of commerce and the public welfare generally, and it is of vital interest to the commerce of the State of California that remedial measures be quickly taken to prevent these pressing dangers to her commercial interests, and to reclaim an almost desolated portion of her Territory, larger in extent than some of the States of the Union, and that it is highly important to the General Government to lend its aid in compassing the results sought by the State.

Therefore, be it enacted, etc., That a sum of $500,000 be, and the same is hereby, appropriated out of any money in the Treasury, not otherwise appropriated, to be expended under the direction of the War Department in such manner as shall be most efficacious in preserving the navigable waters of the State of California from injury by the deposits of debris from hydraulic mining, and said amount appropriated is hereby made immediately available.

A. W. SANBORN & Co., in this city, while being agents for the celebrated Mitchell farm and spring wagons, are also manufacturers and dealers in carriages, express and business wagons from their own manufactory in Manchester, N. H. This firm has a large assortment of first-class vehicles of various styles.

News in Brief.

COL. JOHN W. FORNEY died at Philadelphia this week.

THE smallpox excitement at New Tacoma, W. T., has about subsided.

THERE are 164 failnres reported in the United States dnring the past week.

THE diphtheria destroyed 2,000 lives in the province of Nova Scotia last year.

THE tenants on four large estates in Ireland have joined the no-rent movement.

FROM pew rents and other sonrces, Beecher's church has an income of $57,000 a year.

SMALL-POX is increasing in Chicago, and the people are flocking to he vaccinated.

SENATOR MILLER has introduced a hill to make the Tulare hig-tree grove a public park.

THE Trades Assemhly of S. F. protest against the employment of convict lahor in manufactnres.

STOCKTON wants three narrow-gauge railroads running out of that city—one to New Hope, one to Farmington, and one to Lockford.

DURING the week ending Dec. 10th, 395,480 standard dollars were put into circulation, against $485,496 for the corresponding week last year.

SERGEANT STEWART, of the Eighteenth Infantry, Fort Assinahoine, M. T., while on escort duly lately, had one hand and both feet frozen.

IT is annonnced that fierce competition in telegraphic commnnication with America and India may he looked for from the new company to he launched next month.

DETERMINED efforts are to he made in Congress to secure the forfeitnre of railroad lands in cases where the conditions of the law have not been complied with.

THE Madera Flume and Trading Co.'s mills, near Fresno flats, have cut over 11,000,000 ft. of lumher during the past season, of which ahont 4,000,000 ft. are still at the mills.

CREDITORS of Lord & Williams, of Tucson, Arizona, representing $39,000 have refused the proposition of H. B. Claffin & Co., to take the assets of the firm and pay 50% of the indehtedness.

THE hearing in relation to the contempt of five mining companies, defendant, in the snit of Marysville *vs.* The North Bloomfield Co. *et al.*, set for Saturday, has heen continued to the 22d inst.

LEVEE work is nearly complete along the Yuha river and around Sacramento, and it appears high enongh for protection. There is a hetter feeling of safety, and hnsiness is generally improving.

HON. B. B. REDDING, W. F. Good and I. D. Redding, of San Francisco; W. C. Belcher, of Marysville, and J. D. Crooks, of Tehama, are the directors of the new hank of Benicia.

THE old Whitehall gold mine, in Spottsylvania county, Va., has heen honght hy a company, among the members of which are Senators Call, of Florida, Jonas, of Lonisiana and others. Gold was first fonnd there in 1809. Nearly $2,000,000 worth of gold has heen taken from the mine.

Pacific Coast Weather for the Week.

The following is a summary of the rainfall for each day of the week ending Wednesday, Dec. 14th, at noon, for the stations named:

[Furnished for publication in the RURAL PRESS by Nelson Gorom, Sergt Signal Service Corps, U. S. A.]

Date.	Olympia.	Portland.	Roseburg.	Red Bluff	Sacramento	San Francisco	Visalia.	Los Angeles.	San Diego.
Thursday, 8th.	.00	.22	.03	.00	.00	.00	.00	.00	00
Friday, 9th....	.04	.00	.00	.00	.00	.00	.00	.00	00
Saturday, 10th.	*	.71	.68	.01	.00	.00	.00	.00	00
Sunday, 11th..	*.04	*.47	*.20	.36	.20	.18	.00	.00	00
Monday, 12th..	.09	.21	.03	.32	.20	.31	.00	.00	00
Tuesday, 13th.	.45	.02	.00	.00	.00	.00	.00	.00	00
Wed'sday, 14th	.11	.00	.00	.00	.00	.00	.00	.00	00
Totals.....	*0.73	*1.63	.0.94	0.63	0.40	0.49	.00	.00	00

* Reports for 24 hours ending from Olympia, and 8 hours from Portland and Roseburg. NELSON GOROM.

Quicksilver Feeder for Gold Mills.

When automatic ore feeders first came into use, no one believed in them. Everybody thought that it would be necessary to have a man with a shovel standing around to help the feeder; that machinery could not do the work as well as a man. It has been found by experience that automatic feeding is the best; that the machine not only does its work as well, but better than the man, and now all mills use automatic ore feeders because more ore can be put through in a given time with the same power than under the old system.

People nowsdays want to make machinery on pretty much everything, and they succeed very well. The latest thing in automatic mechanism for quartz mills is a quicksilver feeder, the invention of Mr. P. C. Du Bois, of this city. Messrs Whitney & Marsball, 22 and 24 Fremont St., sole agents. We illustrate this device on this page.

This machine is for feeding quicksilver to the mortars of *gold mills*. It is so connected to the cam shaft, that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and, by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortars. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.

A chief point of excellence of this machine is, that it

DuBOIS' AUTOMATIC QUICKSILVER FEEDER.

allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from one to four minutes. As the gold goes in, and also out of the mortars continuously, it is necessary, in order to effect the best amalgamation, that the quicksilver should go in continuously.

The second point of excellence is, that it renders the feeding of quicksilver practically perfect, as to regularity. A superintendent can adjust the feed to suit the ore being worked, and feel certain that a regular, uninterrupted feed will be kept up during his absence, which is impossible to attain under the general method of hand feeding. It places the feeding of a quantity of quicksilver proper for taking up *all* the gold in the ore, under the control and knowledge of the superintendent alone, and that, with but a few moments of his attention each day.

The reservoir of the machine holds 25 lbs. of mercury—a quantity sufficient for some weeks' work. A lid fastening on top of the tank keeps all secure. The cup which throws out the mercury can be replaced by a larger or smaller one, as the ore requires more or less mercury; several sizes of cups go with each machine. The frequency of feed is regulated by turning a nut, which controls the thrust of the bar that drives the ratchet wheel; thus making the ratchet pass either one, two, three or four teeth space, at every revolution of the cam shaft.

Business Offices and Sunny Rooms to Let.

We have some desirable rooms to let adjoining the offices of this paper which will be rented on favorable terms. Stair entrance, No. 252 Market St. Elevator, No. 12 Front St. Parties wishing offices, etc., will do well to call and see them. DEWEY & CO.

Attend to This.

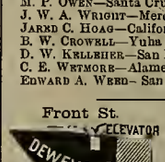
Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

ANNUAL STATISTICIAN of 1881.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 816 California st. Price, $4

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Yuba and Sutter counties.
D. W. KELLEHER—San Mateo and Santa Clara counties.
C. E. WETMORE—Alameda county.
EDWARD A. WEED—San Francisco.



Patent Agency and Newspaper Offices.

Dewey & Co.'s Patent Agency and the business offices of the Mining and Scientific Press, Pacific Rural Press, Pacific States Watchman, and the Fraternal Record, are now favorably situated at No. 252 Market St. Elevator entrance, *No. 12 Front St., S. F.*

The Californian.

Back Volumes and Single Numbers for Sale.

Copies of the above Magazine can be had in single Nos. or Vols, (bound or unbound) from No. 1, Jan., 1880, to July 1, 1881. Price, 35 cts. for single copies; $1.50 per volume; bound volumes, $2.25 "A handsome California gift." Prices reduced to the trade for large orders. Address this office.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

BOOKSELLERS, STATIONERS, ETC.—Messrs. Payot, Upham & Co., No. 204 Sansome Street, are one of the oldest, most enterprising and reliable firms in the book and stationery trade in San Francisco. Scientific, industrial and foreign publications are a specialty with them. They are also noted for their first quality of blank book and fine stationery line of goods.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

Cylinder Printing Press for Sale.

A large cylinder Hoe printing press, for country newspaper work, can be bought cheap by addressing
Press, Box 2361, S. F.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francisco.

COPP'S "U. S. MINERAL LANDS, LAWS, FORMS, INSTRUCTIONS AND DECISIONS."—1881. 570 pp. In full law binding, $4.50; half law binding, $3, at this office.

San Francisco Metal Market.

[WHOLESALE.
WEDNESDAY, December 14, 1881.

IRON.—	
American, Pig, soft, ton	— — @30 00
Scotch, Pig, ton	25 50 @27 50
American White Pig, ton	— — @— —
Oregon Pig, ton	— — @— —
Clipper Gap, No. 1	— — @26 00
Clipper Gap, White	— — @30 00
Clipper Gap Car Wheel	— — @33 7½
Refined Bar	4 @
Horse Shoes, keg	— @ 5 50
Nail Rod	— @ 7½
Norway, according to thickness	6½@ 70
STEEL.—	
English Cast, lb	13 @ 15
Black Diamond, ordinary sizes	— @ 15
Drill	15 @ 16
Flat Bar	16 @ 18
COPPER,—	
Ingot	— @ 22
Sheet	— @ 20
Sheating, Tinned 14x18	— @ 31
Nails	— @ —
Bolts	— @ 33
Old	— @ —
Bar	— @ 22
Cement, 100 fine	— @ 15½
LEAD —	
Pig	— @ 5
Bar	— @ 6
Pipe	— @ 8
Sheet	— @ 9
Shot, discount 10% on 500 Bags	
Drop, per hag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES.—	
10x14 I C Charcoal	— @ 7 50
10x14 I C Coke	6 15 @ 6 40
Banca Tin	— @22 50
Australian	— @23 50
I. C. Charcoal Roofing 14x20	— @ 6 90
ZINC.—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS.—	
Assorted Sizes	4 00 @ 4 15
QUICKSILVER.—	
By the flask	40 @ 41
Flasks, new	— — @ 1 25
Flasks, old	— — @ 1 05

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, December 14, 3 P. M.

SILVER, ½.

GOLD BARS, 890@910. SILVER BARS, 10@18 ₱ cent. discount.

EXCHANGE on New York, ½ premium; London, 49½@49¾; Paris, 5.20 francs ₱ dollar; Mexican dollars, 91½@92½.

NEW YORK (4 per cent), 118¾.

Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

SAN FRANCISCO, DECEMBER 2, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 35, of Seventy-five Cents (75 cents) per share was declared payable on Monday, December 12, 1881, at the office in this city, or at the The Farmers' Loan and Trust Company in New York. WM. WILLIS, Sec'y.

Office—Room No. 29, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

SAN FRANCISCO, CAL., DECEMBER 2, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 36, of Seventy-five Cents (75 cents) per share was declared, payable on Monday, December 12, 1881, at the office in this city, or at The Farmers' Loan and Trust Company in New York. WM. WILLIS, Sec'y.

Office—Room No. 29, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company.

SAN FRANCISCO, DECEMBER 6, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, a Dividend (No. 24) of Twenty-five Cents (25c) per share was declared, payable on THURSDAY, Dec. 15th, 1881, at the office of the Company, room 19, 328 Montgomery street, San Francisco, California. Transfer books will be closed on December 10, 1881, at 3 P. M. JOSEPH NASH, Sec'y.

ANNUAL MEETING.

THE REGULAR ANNUAL MEETING OF THE

Gould & Curry Silver Mining Company,

Will be held at the office of the Company, Room 60, Nevada Block, No. 309 Montgomery street, San Francisco, California, on MONDAY, the nineteenth day of December, 1881, at the hour of one o'clock, P. M., for the purpose of electing a Board of Trustees to serve during the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Thursday, December 15, 1881, at the hour of 3 P. M. ALFRED K. DURBROW, Sec'y.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company.

SAN FRANCISCO, DECEMBER 10, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, Dividend No. 58, of Fifty Cents (50c) per share was declared, payable on Thursday, December 15, 1881. Transfer books closed on Monday, December 12, 1881, at 3 o'clock, P. M.

WM. WILLIS, Sec'y.

Office—Room 29, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

JAMES A. MARS,

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Branch offices in New York, Boston, Philadelphia, Chicago, St. Louis, and London, England.

Only mining properties of ascertained value negotiated.

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"THE $1,000 CHALLENGE"

Ore Feeder for Quartz Mills.

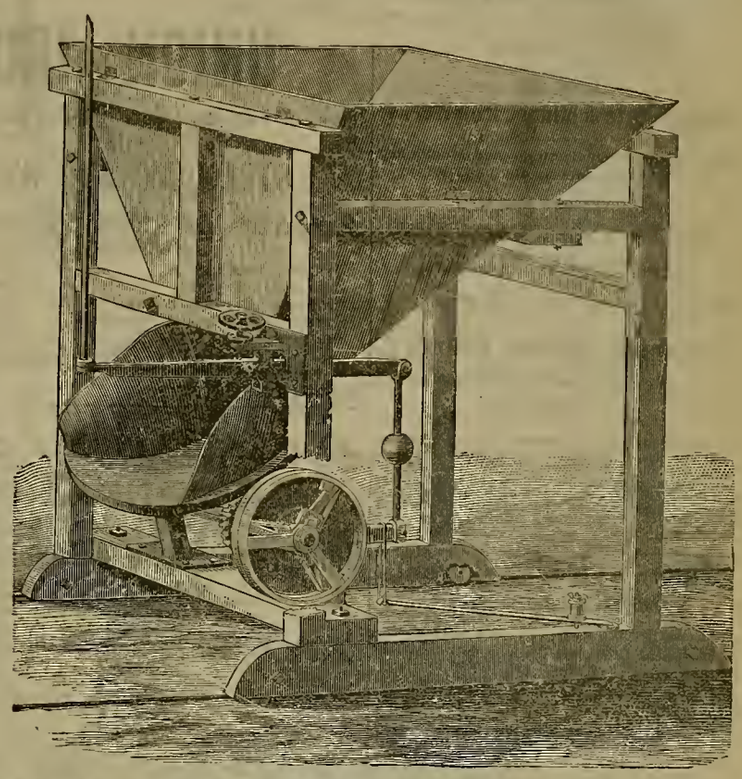
OVER 800 ARE NOW IN USE, GIVING ENTIRE SATISFACTION.

Awarded First Premium at the Tenth and Twelfth Industrial Fairs of the Mechanics' Institute.

Twenty Per Cent. More Ore Crushed with Fifteen Per Cent. Less Wear of Iron than by Hand Feeding.

The accompanying cut illustrates the recently introduced Grip, and also the Spring Attachment, which replaces the Weight heretofore used, and which are obvious improvements.

It is now fully demonstrated, after careful and long continued experimentation and practical use, that the plan upon which a perfect Ore Feeder must be constructed is that of a carrier, and not that of a shaking-table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Jerky or spasmodic contrivances will not answer the purpose for wet or sticky ores.



The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20	Stamp	Tuolumne	county,	Cal.
Sheep-Ranch	20	"	Calaveras	"	"
Mahoney	40	"	Amador	"	"
Zelle	40	"	"	"	"
Placerville	40	"	El Dorado	"	"
Gross	80	"	"	"	"
Julian	20	"	Placer	"	"
St. Patrick	15	"	"	"	"
Providence	20	"	Nevada	"	"
Omaha	10	"	"	"	"
Green Mountain	60	"	Plumas	"	"
Plumas-Eureka	60	"	"	"	"
Bulwer-Standard	30	"	Bodie Dis.,	Mono,	"
Standard	20	"	"	"	"
Noonday	30	"	"	"	"
Bodie	10	"	"	"	"
Christy	5	"	Uintah Co.,	Utah.	
Ontario	40	"	Parley's Park,	"	
Contention	20	"	Tombstone Dis,	Arizona	
Grand Central	20	"	"	"	
Harshaw	20	"	Patagonia,	"	
Sunshine	20	"	Idaho Springs,	Col.	
Homestake	200	"	Black Hills,	Dakota.	
Father De Smet	80	"	"	"	
Hidden Treasure	40	"	"	"	

Superiority of the "Challenge" Ore Feeder Demonstrated!

At the "Christy" Mill, Uintah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "Eclipse."

The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted.

The "Silver King," Mill of Arizona, also removed the "Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill, of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.

JOSHUA HENDY, Agent,

Machine Works, 49 and 51 Fremont Street, San Francisco.

Manufacturer of Quartz Saw Mill and General Machinery. Also Agent for BAKER ROTARY PRESSURE BLOWERS, and WILBRAHAM ROTARY PISTON PUMPS. P. BLAISDELL & CO.'S Machinists' Tools. HOT POLISHED SHAFTING from the Akron Iron Company, of Akron, Ohio.

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Dewey & Co. { 252 Market St. } **Patent Agt's**

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There has been steady and tolerably rapid advancement made in the growth of a majority of the towns in Colusa, Butte, Tehama and Shasta counties. Especially is this so in the agricultural districts where the land produces at least fair crops in all seasons—wet or dry—as does the land on the Reading Ranch. Those looking for homes in California where diversified farming will pay every year; where wood and water are plenty and easy to be obtained, and other desirable advantages are to be had, should address the proprietor of the Reading Grant.

Some 14,000 out of 26,000 acres of the grant remain for sale at comparatively low rates, in quantities to suit purchasers, on easy terms. Prices range from $5 to $30 per acre. The tract is between two and three miles wide, with the Northern Division of the C. P. R. R. passing centrally through its entire length. Send postage stamp for free circulars containing information about Shasta County and these lands, to the proprietor of Reading Ranch. EDWARD FRISBIE,

Anderson, Shasta County, Cal.

HARDWOOD LUMBER,

Oak Timber and Plank, Thin Fancy Woods,

— AND —

VENEERS and DOWELS.

JOHN WIGMORE, 129, 131, 133 and 135 Spear St., S. F.

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UNION IRON WORKS,
SACRAMENTO, CAL.
ROOT, NIELSON & CO.,
MANUFACTURERS OF
STEAM ENGINES, BOILERS AND ALL
Kinds of Machinery for Mining Purposes.
Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.
Front Strset, Bstwsen N and O Streets,
SACRAMENTO, CAL.

Golden State & Miners Iron Works,
Manufacture Iron Castings and Machinsry of all Kinds at Grsatly Reducsd Ratss.
STEVENSON'S PATENT
Mold-Board AMALGAMATORS,
Golden State Pressure Blowers.
First St., bstwesn Howard & Folsom, S. F.

California Brass Foundry,
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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. PRICES MODERATE.
J. H. WEED. V. KINGWELL.

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WM. H. BIRCH, Prop'r.
119 Beale Strset, San Francisco.
General Mechanical Engineer and Machinist. Steam Engines, Flour, Quartz and Mining Machinery. Sole manufacturer of Brodie's Patent Rock Crushers and Steel-Faced Tappits. Agent and Manufacturer of F. A. Youse's Patent Steam Packing Rings for Steam Pistons. The best ever invented; can be applied to any Engine Piston and give entire satisfaction to those using. Steam, Hydraulic and Sidewalk Elevators. Repairing promptly attended to.

STEAM ENGINES AND BOILERS
Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by
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THOMAS THOMPSON. THORNTON THOMPSON.
THOMPSON BROTHERS,
EUREKA FOUNDRY,
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MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

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Mining Engineer.
MINING PROPERTIES EXAMINED AND REPORTED ON
FRISCO, BEAVER COUNTY, UTAH.

A Rare Chance For
ASSAYERS OR MINING COMPANIES!
All the tools and Utensils, including Bullion Scales, Balances (Oertlings best), Furnaces, Counters Safe etc., at present in one of the oldest assay offices, (existing about 26 years in this city), for sale at a bargain Principals only apply to JOHN TAYLOR & CO.,
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CLAYTON AIR COMPRESSORS,
With Price List, issued Sept. 1, 1881.
CLAYTON STEAM PUMP WORKS,
14 and 16 Watsr Strsst., Brooklyn, N. Y.

LUTHER WAGONER. JNO. D. HAMMOND.
WAGONER & HAMMOND,
MINING ENGINEERS,
No. 318 Pine St., S. F.

PATENT ADJUSTABLE FIRE GRATE.
It surpasses all other Grates for convenience and economy in use of fuel. No stove complete without one. It will pay for itself in one week. Manufactured by
KEARNS & CALDWELL, 901 Shotwell St., S. F.

COKE. PATENT. COKE.

This COKE is exclusively used by Prof. Thomas Price, in his assay office, hy the Selhy Smelting and Lead Co., Prescott, Scott & Co, Risdon Iron and Locomotive Works and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Copper Queen Mining Co., Longfellow Copper Mining Co. and other consumers in Arizona.

The undersigned are in receipt of regular supplies from Cardiff, Wales, and offer the COKE for sale in quantities to suit purchasers.

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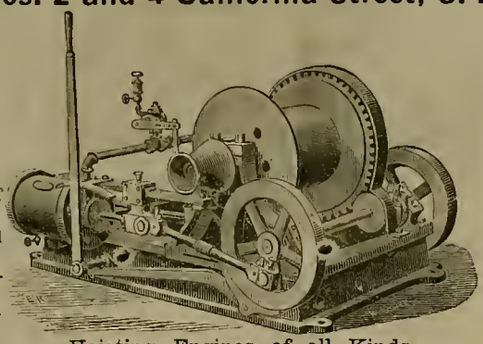

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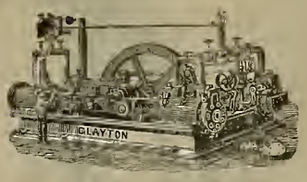

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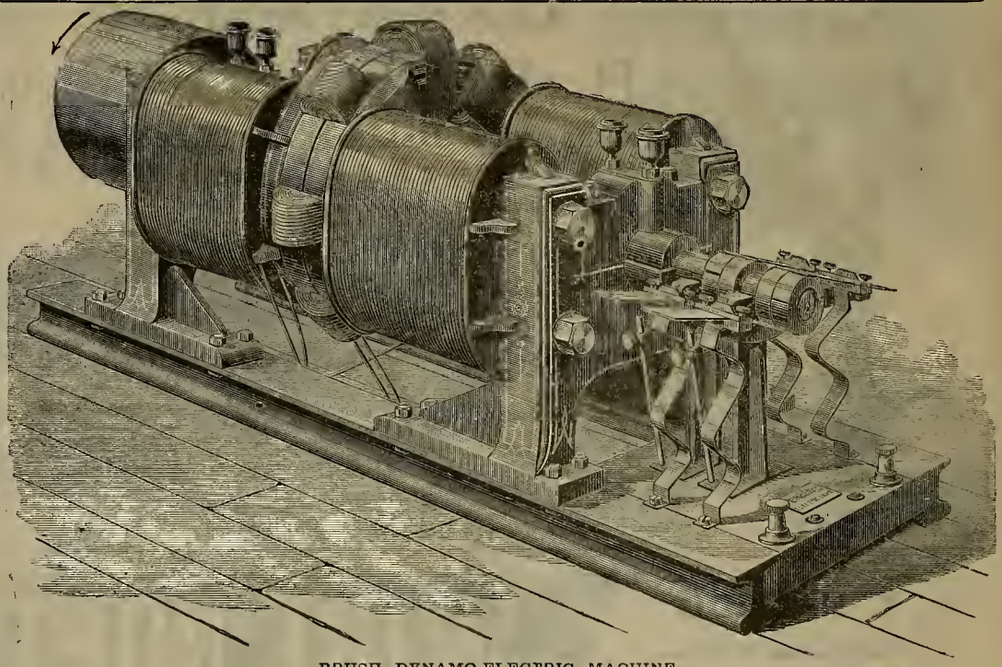

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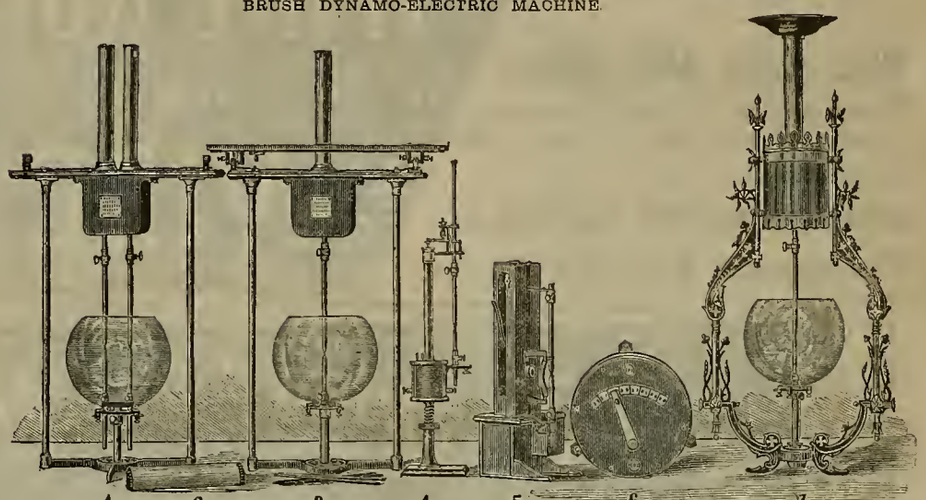

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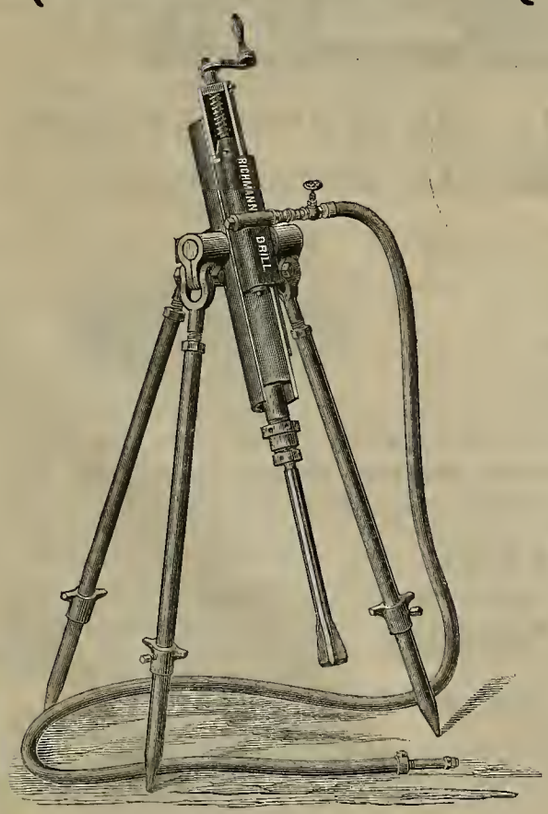

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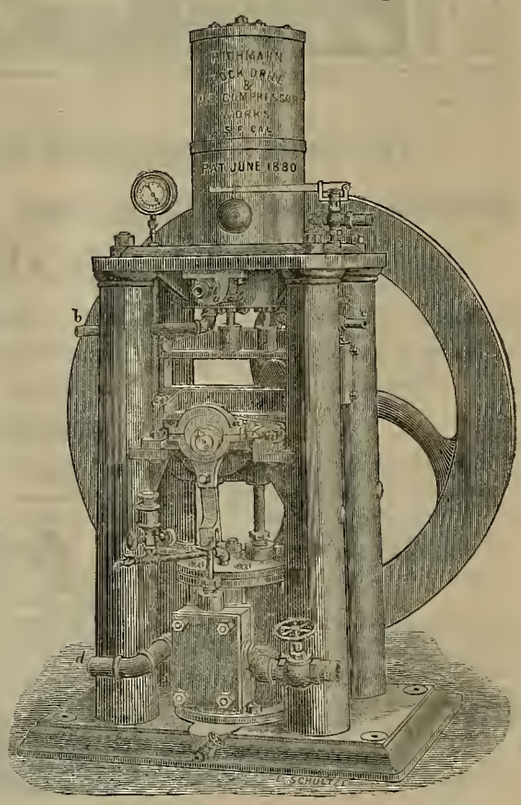

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, DECEMBER 24, 1881.

VOLUME XLIII Number 26

Prejudice Against Mining Machinery.

In all hranches of mechanical indnetry the workmen reeent the introduction of machinery whioh ie to take the place of their hand lahor, and they seem to do this even if it ie ehown to he of ultimate benefit to their class. This ie, of conree, at firet, for in tbe end the machinery, if at all economical, is bound to work its way into use. When machine drille were first ueed there wae a great howl against them and we all know what a hard fight it was to get Giant powder into tbe minee, and how hard the men worked againet it. In fact, no improvements are ever looked upon with great favor at firet hy the class which ie to use them.

A case in point is that of the coal cutting mechinee in Eogland. Theee and other applianoee which have heen introduced for the economical and eafe working of collieriee have not heen received with that enthusiasm that wae to have been expected. Experience has ehown that tbe machinee already in operation have not only nnder cut coal far more expeditiouely and economically, hut with greater eafety than it could poesihly he done hy hand. The machinee, with ecarce an exception, have turned out eucceefnl eo fer as the cutting of coal ie concerned, but the reason of their non-uee ie given hy the London *Mining Journal* ee the indieposition on the part of the minere to allow them a fair trial.

Pick machinee are now at work in eeveral places, and donhle pick, elottere and rotary machinee ae well; and, in fact, it ie now over 20 yeare eince the firet coal cutter was tried. A number of machinee have heen tested at collieriee, and have done good work, effecting in a certain time ae much work ae eome 12 or 15 good colliere.

Lindeay Wood, one of the commieeionere on accidente in coal minee, a large colliery owner in the nortb of England, and who has paid ae mnch attention to coel-cutting machinee ae prohahly any man, in hie evidence hefore the eelect committee on coal, etated that in one of the collieries with which he wae connected he had two coal-cutting machines working for ahout 10 years, and althongh in the firet ineetance the effect had not heen to reduce the amonnt of manual lahor to any appreciahle extent, yet it had the effect of producing more round coal per ton wrought, and coneequently was a commercial enccess, although it did not reduce the amonnt of manual lahor. The eeam, however, could not he worked longwall, which was a great drawhack. Mr. Firth'e machine was aleo tried hy Mr. Wood, and he helieved that machinery wonld do the work, and relieve the men of the oppreesive lahor of cutting hard coal. Mr. Dickineon, the Chief Inepector of Minee, on the same occaeion in his evidence, eaid he had eeen several machinee at work, and the maker of one of them—Wenstanley'e—had at the time as many ordere for them as he could execute, and he helieved they would continue to increaee.

The machinee are worked by compreesed air, and the exhauet air coole tne working places. In addition, there ie increaeed output, and the comparative eaee with which coal can he worked at great depths ee compared with mannal lahor in euch hard work ae cutting coel in a heated atmoephere. Yet, notwithstanding all thie, these machines are not used.

THE LATEST "ISTHMUS" CANAL PROJECT is for an opening through the northern portion of the Malayan peninenla, which etretchee eouthward into the Indian ocean a dietance of 500 milee. Thie canal will he aeeieted hy a natural waterway wherehy the distance from the western to the eaetern ehore is narrowed down to only 30 miles of cutting. With euch a canal the dietance from eouthern Aeia to China would he reduced hy ahout 600 milee. The London *Times*, in approving of the project, eaye that the engineering difficultiee are not of a very difficult character, while the political drawhacke are *nil*. Thie project ie certain to he accomplished eooner or later, and the preeent eeeme to be a favorahle time to effect thie important improvement in the navigation of one of the principal ocean rontes of the world.

Water for Blasting.

Now tbat blasting will bave to hs diecontinued in eo many "fiery" coal minee in Great Britain, the best snhetitute will he nscesearily looked for, and it is euppoeed to have already heen fonnd in water. There could hardly he found two more oppoeite things to accomplieh the eame purpoee than fire and water. Of couree, the powder ie mnch more expeditioue and effective and will he used where allowed, hut in the dangeroue minee where there ie eo much chance of loee of life the water method will, no douht, eerve the purpose well.

Sir George Elliot, in his evidence hefore the Select Committee on Coal, eaid he did not look eo much to the coal-cutting machine aeto that which wae invented by Mr. Bidder and Mr. Chuhh, which, he helieved, would have to he used, hecauee it could he eucceefully ueed ae a euhstitute for gunpowder and hlasting. He further etated: "I have eeveral of them in nee whenever gunpowder hlasting ie necessary; and where hlasting cannot be done with eafety, theee inetrnmente are need in the place of gunpowder, and they answer moet effectnally. Inetead of putting a ehot to hlow out your coal, yon pnt in an instrument which yon expand hy hydranlic preeeure until it hurets the coal out."

This etatement, coming from the highest coal-mining authority, would eeem to prove that there is a good snhetitute for powder availahle. In hlaeting with powder there ie danger to he apprehended from eeveral qnarters, and mies shote are hy no means nnfrequent, either from imperfect drilling or through the ineufficiency of the powder. But it appears that miee ehots are effectually prevented by McDermott'e drill.

Mica Masks for Furnace-Men and Others.

A well-known Germen manufacturer of mica waree, Herr Raphael of Breslau, now makes mica maske for the face, whioh are quite traneperent, very light, and affected neither hy heat nor hy acide. They afford good protection to all workmen who are liahle to he injured by heat, duet or noxioue vapore, all workers with firs, metal and glass meltere, etonemaeone, etc. In all kinde of grinding and polishing work the flying fragmente rehound from the arched mica plates of the mask without injuring them. These platee are fixed in a metallic frame, which ie well ieolated hy meane of aeheetoe, eo ae not to he attacked hy beat or acid. Theee maske allow the turning of the eyee in any direction, and, as egainst mica spectaclee, they afford the advantage of protection to the whole face. In certain caeee, the neck and shouldere may aleo he guarded hy a sheet of cloth impregnated with fire-proof material, or by aeheetos eheet, attached to the mask.

The interval hetween the mica and the eyee allowe of workmen who have poor eyeeight wearing epectacles, and of workere with fire or in melting operations wearing colored-glaee epectaclee under the mask, without fear of hreakage of the glass, mica heing ench a had condnctor of heat. Where the mask hae to he worn long it ie found desirahle to add a caoutchouc tuhe with mouth-piece for admieeion of freeh air; the tuhe pasees out to the ehouldere, where its funnel-ehaped end (sometimee holding a moietened eponge) ie enpported. The mask hae a eort of cap attached to it for fixture on the head.

THE PALMER SAFETY CLUTCH FOR ELEVATORS.

A New Safety Clutch.

The Palmer eafety clutch for elevatore, which ie ehown in the engraving on this page, is the lateet device in that line, and ie one of the simpleet and moet effective. The clutchee proper are atteched to a pair of hare under the platform, hut entirely independent of it. Theee bars, cerrying the clutchee, are halanced by a weight, the rope of which goee over a eister pulley on the elevator pulley shaft. All the weight the supplemental rope has to carry is that of the hars and dogs.

The epringe shown, keep the doge away during the natnral travel of the elevator.

The skeleton platform, (that is, the hsre) carrying the clutch will rise and fall with the elevator, and yet be independent of it. If now the rope-carrying elevator ehould break and the elevator drop, it will only drop an inch or two, and will then strike the dogs of the clutch, theee holding the ekeleton lower platform and preventing further deecent. Thie action ie inetantaneoue and positive, no spring, weighte or anything heing reqnired. The cage ie caught hefore any momentum ie given it. The platform hare underneath eupport all the weight on the elevator, the qnicker the catch and lighter the fall. The dogs jam toward each other, one pair on each eide, and do not, therefore, tend to epread the guides, as moet clutchee do. The cage ie canght inetantly.

Overhead is an automatic hall governor attachment eo that in caee the elevator ehonld etart hy the run of exceeding a certain speed, an ingenioue yet eimple arrangement tripe the rope connecting it with the clntch, holding the clntch and letting the platform come down on the dogs and etop.

One of these elevatore was put up in the U. S. Quartermastere' huilding, in thie city, jnst after the close of the Mechanice' fair, where it wae exhihited. It was overloaded one day after a month or eo, some 2,500 lbe. heing put on. When they opened the valve to raiee it, the thing etarted down on the run. The ball governor action tripped the clntch and the fall wae only 18 inches from the level of the floor. No damage, however elight, wae done.

One of theee clutchee has heen lately put in the Grand hotel, after the opinione of a number of experts hed been taken, and various olutchee examined. In thie there is a conductor rod, eo the hoy can throw the clutch into action at any time, if he desires. It acte aleo automatically, of couree. There is no circumetance nnder which thie can hreak that it cannot he caught. As will he eeen hy the engraving, the device ie qnite eimple. The doge travel np and down all the time, hut in caee anything breaks the platform drope on them, and they jam into the wood and catch the load. In addition to thoee mentioned, theee clutches are on eeveral other elevatore in this city. Mr. C. C. Palmer, the inventor, hae an office at No. 303 Montgomery street, where further information may he had.

THERE ie an artesian well in the Bay of San Francisco. It is ahout two miles from the Alameda shore, oppoeite Newark, at a houee on the oyster hede of Doane & Co. This houee ie on a platform eet upon pilee. The well ie 212 ft. deep, with an outeide pipe of eight inchee and one of eix inches on the ineide. A filling of cement prevente leaking and eaves the inner pipe from salt water. The water ie good. These oyeter hede cover a large area, are located in Alameda, Santa Clara and San Mateo countiee, and are planted with Eeetern oyetere.

THE Moulton Co. hae furnished Butte with an excellent quality of water, and now propoee giving that great mining camp power for eiectric light. The company has introduced the light in the hoisting works, and the mill will soon he supplied.

LARGE SHIPMENT OF QUICKSILVER.—Four tone of qnicksilver reached Helena, Montana, the other day from the terminne. It ie for the nee of the Alta Montana Co., at Wickee.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Winters at Galena and Sawtooth, Idaho.

Editors Press:—Referring to your issue of Nov. 12th, we notice en article clipped from the Eureka *Sentinel*, which states that it takes two summers to get macbinery for a 20-stemp mill into Sewtooth, I. T.

We regret that the correspondent of the *Sentinel* should hazard expressions on a subject which he seemingly knows so little about, and would inquire of him why it should take two summers to put up a mill at Sewtooth, more than any other place?

The country surrounding Galena and Sewtooth too long has suffered from gross misrepresentations, and it is the purpose of this article to correct the many wrong impressions regarding its accessibility from Mey to Jenuary, so industriously circulated hy *all* the papers of the lower towns of Wood River, from which outside papers so frequently take their cne. The facts of the case are these: On the first of July last, Sawtooth, then only a town in name, was separated from Galena and the entire outside world hy a high and impassable mountein range, 12,900 ft. above the level of the sea in its lowest available pass, and utterably impesseble except for the snre-footed mule.

Before the first of November a splendid wagon road had long since been completed, a sew mill, two shingle mills, and all the mechinery for a heavy stamp mill, with the latest improvements, was in place; two immense lime kilns were in active operation, and Sawtooth had grown to be e town of importence.

Not being familiar with the different pheses of climete here, on the first eppearence of a little snow, the manegement of the different mines put them all upon a winter besis, and left them until spring. Snow, however, has not, as yet, fallen to e greeter depth than 18 inches on the line of roed, and teaming from Ketchum has been going on uninterruptedly.

The stage sleigh which cerries the mail makes the time between Ketchum and Sawtooth, 45 miles, in eight hours, and the contractor antioipates no difficulty in keeping the road open all winter. J. E. C.

Gelena, Wood River, Idabo, Dec. 10.

The St. John Del Rey Mine.

Editors Press:—As the matter of the treatment of auriferous pyrites at the St. John Del Rey mine in Brazil, by amelgametion in the raw state in harrels, hes been again referred to in an interesting article in your columns, it may not be impertinent tostate the following circumstancs:

Some time ago I was consulted by Mr. C. G. Nelson as to the advisability of introducing the chlorinetion process in the treetment of sulphurets from the above named mine, as the process then in use gave a result of not more then 60 per cent of the assay velue, "reports printed and published in London," notwithstanding. Considering the locelity, and the low grade of materiel operated on, I did not venture to advise the adoption of chlorinetion immediately, but suggested a series of experiments on a moderate scale of magnitude. What course was pursued I know not, but Mr. Nelson hes recently assured me that the use of berrel amalgametion has been discontinued. Mr. Nelson was acting on bshalf of an English gentleman who ceme here from Brazil, where he had been investigating the affairs of the mine.

C. H. A.

The Providence Mine.—During the pest two weeks the mill at the Providence mine hes beeu shut down in order to bring in more weter, the amount furnished hy the Excelsior Water Co. not being sufficient to run the boisting works and the large 40-stamp mill. The owners of the Providence having mede arrangements with the South Yuba Water & M. Co. for supply of water from the snow mountein ditch, have erected a suspension bridge across Deer creek, below the Merrifield mine, and have hed 1,600 ft. of 22-inch iron pipe constructed, for the purpose of conveying water to the mill and hoisting works. This will give a pressure of 400 ft. and afford water enough to run 500 stamps, if necessary. The work is about completed, and the water will he turned on in a day or two, when the powerfnl machinery will he set in motion and the crushing of qnertz renewed. Dnring the two or three weeks occupied in making these changes, the mine hes been shut down, owing to the accumulation of ore upon the dumps end in the stopss. A large nnmher of miners have been consequently without employment during the time, but they will probably go to work again next week, and it is generally understood that there will he work for a number more of miners, as the mill can now bs run to its full capaoity.—*Nevada Transcript.*

Precautionary signals on our Northern lakes have redneed the numher of disasters to vessels from 207 in 1869, to 91 in 1879, and tbe losees from $1,560,000 in the former year to $455,205 in the latter year. We need the same eystem on this coast.

Mining Debris Question in Congress.

Bills Introduced by California Congressmen.

Congressmen Page has introduced in the Honse of Representatives the following self-explanatory hill on the subject of mining debris:

Whereas, A contest exists in the courts of the Stete of California, hetween a portion of the egricnltnral community and the mining industry of that State, by reeson of the assertion by the miners of the right to work their mines by hydraulic and other processes, which have heen continuonsly in use since the discovery of precious metels on the Pacific coest, which rights and use have been senctioned hy lews and common nsage during the past 30 years or more; and

Whereas, These rights and common cns-toms are not disputed by the owners of lands in the velleys helow the mines, a large amount of which have been injured hy the deposit of tailings or debris from the mines; and

Whereas, A large portion of the agricultnrel lends in the Stete are in danger of destruction from the results of the said hydreulic mining, and towns and cities on the banks of tbe streams affected by the debris ere being destroyed; and

Whereas, The agricultnral interests of California—the first wheat-producing State of the Union—es well as the labor of onr farmers, ere heing destroyed by debris covering np their fields, gardens and homes; and

Whereas, The resnlts of 30 years' toil are thus imperilled, and families and commnnities threetened with impoverishment; and

Whereas, The harhor of San Francisco is being shoaled hy the deposits of mining debris, and it is only a question of time when serious consequences therefrom may impede the national commerce of that important harbor; and

Whereas, The Stste of Californie asserts the right to control the rivers of the State under the plea that mining operations are damaging them; and

Whereas, One or two of the counties of the State and one of the incorporated towns have also asserted rights hostile to the mining industry; and

A Syetem of Public Works.

Whereas, The Stats of Calhfornie, througb its Legisleture, some two years since, enected a law to "provide dreinage," heving for its object to cure the evils compleined of; and

Whereas, The Supreme Court of the State has recently decided that the Stete hed no such power, thns leaving the oontest between the conflicting interests to continue; end

Whereas, This contest which is now pending in the State and Federel Conrts, involving vast interests, will continue unless remedial measures are teken by the General Government, which can alone grapple with these issues hy instituting a system of onblic works; and

Whereas, The present contest, if continued, will lead to serious results, prejudicial in meny ways to the hest interests of the nation et large; and

Whereas, The Congress of the United States bas by verious enectments, extending through a long series of years, encouraged and fostered the mining industry by the reservation of its mineral lands from sele, except for mining purposes, and also by specially providing for the protection of all weter-rights, reservoirs and the rights of way for canals for water nsed in the nines, as well es for the use of timber upon the public lands for the seme purpose, and hes also charged the miners donhle the price for mineral lands that it has charged the agriculturists for farming lands; and

Whereas, By reason of such encouragement and fostering influence, the mining industry on the Pacific coest has attained enormous proportions, in which industry our citizens have invested their meens to the extent of at least two hundred million dollars, which investment is in jeopardy, and is at present seriously embarrassed by legal complicetions; and

Whereas, Through this mining industry in California alone not less than twelve hundred millions of dollars in gold have heen extracted from the earth, which susteined the nation in its time of trouble, es well as influenced for our benefit all financial, commercial and other pursuits and industries; and

The Value of the Gold Depoeits.

Whereas, The largest known gold deposit in the world, estimated to contein at least $3,000,000,000, is contained in the auriferous gravel channel in the Stete of Californis, which can only be extracted hy the modes and usages in operation during the past 30 years, and out of which is taken yearly at least $13,000,000 ont of a total yeerly gold product of $19,000,000; and

Whereas, This yearly product will continue for the next 100 years or more, if this gold-producing interest is properly protected and cared for by the General Government, but which is now seriously embarrassed by conflicting interests; and

Whereas, It is believed that a proper system of engineering works (not expensive when the vast interests at stake are considered) can he constructed by the General Government without injury to any interests, but with benefit to all, hy which the mines can continue to be worked without detriment to the agricultnral interests, and thus keep up the yearly supply of gold, so essential to our prosperity; and

Whereas, The known gold area which will pay to mine by any known process is qnite limited, and the agricultnral area prectically unlimited; and

Whereas, The policy of our Government is now, and has been, to protect and foster in all ways, the production of the precious metals and the mining industries connected therewith; and

Whereas, It is helieved that e settlement of the grave issnes which have arisen in the Stete of California in reletion to the physical features of that State and the locetion of the mines is pecnliarly under the province of the Generel Government which hes reaped such vast bsnefits from the minlng interests in that State, and to hermonize these interests, which it is confidently steted by onr most able scientists and engineers, can be done by the constrnction of proper works at the expense of tbe Government; therefore,

Be it enected by the Snate and House of Representetives of the United States of America in Congress essembled, that the sum of $500,000 be and the same is hereby appropriated out of any money in the Treasury not otherwise appropriated, for the pnrpose of making such improvements or works under the direction and supervision of tbe Secretary of Wer as he may see fit for the improvement of the Sacramento, Ynba, Feather and American rivers and their tribntaries, so as to protect them from overflow from the debris end the filling up of the said rivers, end for the removal of the deposits of debris that now impede navigation, and also to prevent the destrnction of lands and property adjacent to the said rivers and to protect the harbor of Sen Francisco from further injury from tbe said cense.

Singular Change in a Mine.

Water Disappearing Without the Aid of Machinery.

Mining men who are familier with the workings of Esmeralda mining district for the past four years will remember the trouhle the Real Del Monte Co. had with water struck in their mine on the 500 level. Very shortly after striking it they were compelled to stop operations until they could get a lerger pump and heevier machinery—the weter rising to or ehove the 300 level, and remaining there until some time after they got the new pump in operation, it being qnite a struggle to lower it to the 500 station. They finally succeeded in draining the shaft and sinking it ahout 300 ft. more, when the foundation of the pumping engine or boh, began to give away, and they could not run the engine fast enough to keep ths water out, and were compslled to stop operations until they could make arrangements to put in a new, substantial foundation. As soon as the pump stopped the water commenced rising, and continned until it was np to the 300 level again, where it remained for severel months. But lately, seys the Esmerelda *Herald*, end to the snrprise of the people interested in the famous old district, the water commenced lowering, without the aid of any machinery, end continued gradually until it is now down to the 500 stetion. What hes caused this greet change? Is it not plain to any person acquainted with the neture of mountain springs, that they invariehly begin to send forth a greater volume of water about the month of Sept., no matter whethsr we have any rain or not? This heing the case, can there be any other theory advanced than that the great flow of water forced up into this shaft, which answered the seme purpose for the wster of this hasin that artesian wells do for other hasins, has found auother channel hy which it is permitted to escape. This cannot he otherwise than the true theory, as the hulk of the water was forced up into the 500 drift until they cnt the seme channel lower down. There was no water coming in at that drift, hut as soon as the pump would stop it would rise above it in a very few hours. W. P. McIntosh says he knew of just such another inoident connected with a mine which he was working, but on a much smeller scale. While sinking a sheft, when the only machinery they had consisted of a hend windlass, with a 20-gallon hsrrel attached to it, the flow of water got so strong that they were compslled to put on three shifts of men, in order to make eny heedway at all, and finally had to ahandon it entirely for some time. Some time afterward they had to clear the shaft of weter, when it was discovered that there was no weter coming in, and they were enahled to continue the work of sinking for a considereble distance farther. It is good news to the people who have so much feith in the mines of this district, and particularly to the Real Del Monte Co., who have already expended so meny thonssnds toward prospecting that portion of it; but as they attained a deptb of ahont 800 ft., and their prospect for a bonanza became more flattering, heing compelled to suspend operations for a time mnst have been anything but a pleasant thing to do. That obstacle heing out of the way, we look forward with pleasure to the time in the near future when we will again hear the wbistle on that hill as reguler as usual, and see the miners busily engaged drifting toward the Jnnietta, where all experienced miners say their great ore body lies.

Regular passenger trains are now rnnning over the Utah and Northern railroad from Ogden, Utah, to Butte, Montana. This railroad ought to do a great deal for the development of Montana, which is a rich and extensive mineral region. Lack of cheap and rapid communication hae heretofore heen the greatest drawback to the progress of the Territory.

Christmas Chimes.

Hail, blessed day! Hail, Christlike morn!
So fill'd with joy, so bright with love!
Thou bringest tidings which were borne,
By angel's voice, from heaven above
To earth beneath, to men below,
In years gone by—tbe long ago.

We hail tbee now, witb bearts that thrill,
And softly list to tidings sweet.
Ring, Christmas bells, a merry trill—
Come angel-voice, kind friends to greet.
Soft Christmas cbimes, a Christlike deed,
Are tidings sweet—a Christmas need.

Swift in tbe footsteps of the beantiful feet of morning, and sometimes "preventing tbe dawn," will go the tripping troops of merry wisbes around the world in tbis gled Christmes time. How came the earth to be helted with this beautiful custom? Who geve to nniversel childhood this happy holiday? Our Christmas carols tell us: "Unto us a child is born." And "tbe government shall be upon His shonlder." And His neme shall be "the Mighty God." Give Him larger welcome and more room, O psople! Homes are happier, hearts are cheerier, lives are cleanlier, hnsiness is harvester, nations are peacefnller, women is holier, and childhood is heevenlier where He is. May all the air be thick witb melodions song. Room for the gift of God.

Christmas! the birthday of the whole world's Savior! I love to tbink of it for what it is—the one glad supreme holidey of the hnman race. Let there be langhter now, and joyous chimes, and games, love-tokens, and the greetings of dear hearts. Who would not take, once in the yeer, a psrfect reprieve from the eches of life, the sedness of a disenchanted heart, the fret and the turmoil of ambition and zeel and douht and wrath! This day means the real presence of the Divine among ns, a new morel force horn for a rece whose moral force was almost gone, a new departure for mankind, and quite properly and logically the heginning of a new mode of connting the world's years. Oh! if we could all fully know just why this is so happy a day as our happy customs try to make it, there wonld be no more sorrow possible here forever.

Whatever tends to make home worthy of the heart's deepest regerd, helps to compose the hest shepe of human welfere. The homes of the peasentry of France have again end egein come hetween that nation end ruin. Ont of those cotteges have come, in hours of need, men, money, and morals. Christmas is an annal exeltation of the fireside. It is not for man as a statesmen, nor as a scholar or soldier, but for man es a being who sits by a fireside, and eats at a table elong with loved ones. Each Christmss should make the crusty old bechelors, and those who imitete riches by boarding in palace hotels, blush with repentence, and abendon their narrow shepe of existence. It is to be hoped that ell the papers and speakers and all the fethers and mother, will so enlerge and glorify this Decembsr feast thet at last it will hecome the chief end of men to be the owner or the occnpant of a home.

Excess is so natural to men that a "merry Christmas" may easily mean indulgences that overtop the symmetry of strength, end to come toppling down on themselves like too ambitious erchitecture. None the less, it may he well to hold to the greeting, "A Merry Christmas," for the Christ-like spirit is one which reeches the hounds of pleasure without ever passing them—is the grape full of juices, yet that does not burst the skin, and so sour in fermentation.

What seems to he the greatest need of our times is not so mnch an increase of wealth in our country, for the people generally heve plenty, but rather do we need some way of enjoying more what we already have. We need not enlargement of our dominions, but consolidation and unity among our many-tongued and widely different popnlation. Among the many possible egencies in bringing about these results, we shonld not overlook the observence of our great national and religious holideys. In these we forget our lines of perties and sects, and come more fully into the life of Americens and of our common Christianity—into the broader love of man as man. In these public rejoicings we forget, for the time at least, our caree and onr deily toil. The interchenges of friendships and gifts make us richer in feeling at least, if not in fact; end, after all, it is the good feeling and good will thet give to life its real wealth and its sweetest charms. We need es a people more holidays, more days of rest and rejoicing; less of striving and worrying to acquire, and more ahility to enjoy whet we have. All hail, then, to Christmas day, with its merry greetings, its joy in the home, its gifts to the yonng snd the old, its love, its hope.

The children's day, the parents' day, the home day, whose nameless power makes truce with toil, conquers and brings hack the bnsiest and most distant ones to the hand-clasping end song-singing and story-telling around the old fireside, as in the deys of yore. Day, es well, it is which opens hearts and hends, promotes the humanities, and makes somewhat real the sentiment of a common hrotherhood.

The Centennial company, Siskiyou county, have found exceedingly rich pay in the hillside of their claim, which pays extravagantly, and seems to he on a hench of rock about six ft. highei than further out in the pit under the river wingdammed.

The Bald Mountain Exteusion Co., of Forest City, Sierra county, has cleaned np within a few days 179 ozs., valued at $3,322.

MECHANICAL PROGRESS.

Another Curious Experiment.

Gath, in ths Cincinnati *Inquirer*, says: "Yesterday a friend of mine took me to see a wonderful sbip or steamboat on the Harlem river, big enough to gst on it and take a ride, which I did. It is oalled the huoyant propeller, and consists of a steamboat 15 or 20 ft. long, propelled on globes of air. As you draw near you see three large yellowish globes, made of sheet iron, revolving on an axle like any other wheel. Tbere are little flanges' protruding from tbe globes, which are also paddle wheels. An engins on the deck makes these two axles revolve, the front axle having only one globe wheel on it, and the rear axle having two. As they revolve any leakage into the wheel is discharged at the axle. Consequently they can never fill. The present sbip moves on globes only six ft. in diameter, but the new ship is tn be built on enormous globes. The theory is that such a vessel will make from 20 to 40 milcs an hour, and an arc being presented at every point, thsre will be no slippags. I suppose the idea of this machino is tsken from the spheres on which we live that go through the air quickly.

Still Another—A Steamboat Wagon.

Great astonishment was created recsntly among the inhabitsnts of the Twenty-fourth Ward of New York, hy their sceing an extraordinary-looking vehicle with thrsc whesls, weighing over twn tons, steam its way across land from the Harlem river to Spuyten Duyvel creek, near tbe Hudson river, and traveling to tbe water's edge, not stop, hut continue on over the surfacs of the water as readily and almost as rapidly as it had traveled down hill on land. It was the "R. M. Fryer," s newly-devised ship or water-carriage.

The principle on which it is constructed is entirely a new ons, and cannot he more briefly described than hy ssying that it travels over the water instead of through it. As mnch difference is claimed by its inventor to exist hetween it and an ordinary boat as between a wagon mounted on wheels snd one that should rest on the ground and hs dragged along the surface hy means of wheels attached to its sides. The new hoat which is merely a model of a large one now in course of construction at Hestings, consists of a deck supported hy a framework resting on the axes of three hollow glohee. The globes being turned hy steam power, serve at once as the wheels of the marine carriage and as huoys, which keep the deck always above the water.

The boet is not intended for uss as a land carriage, hut one of the advantages it possessss is the power to travel over sand hare, or to hack off from a sandy shore without externel appliance. The absence of friction, mr reover, attained hy placing the boat ahove the water instead of in it, will enable the huilder, he claims, to ohtein a far greater rate of speed than is possihle to any hoat floating in the water. So far as the trip across land is concsrned, there is no doubt, from the demonstration ahove described, that a ship can he made to travel without any water to float in. For the more complete demonstration of some other points the inventor ie compelled to wait for the completion of the lerger vessel he is building, which is to travel on three globes of 24 ft. diameter.

BOILER CAPACITY VS. HEATING SURFACE.—A correspondent of the Boston *Journal of Commerce* calls attention to some experiments made at the Forest river lead mills in 1861 which sue tain the position taken that extent of heating surface, as ordinarily calculated, does not always increase the hoiler capecity. The following shows the resnlt of the experiments: Four 12 inch diameter tubes were set as follows:

15 Ft.	5 Ft.	5 Ft.	5 Ft.
.....	.....	.....	.....
.....	.....	.....	.....

The first over the fire was 15 ft., grates 3 ft. long. The other tuhes were eacb 5 ft. long. Water hoiled in the first tube in forty minutes (210°); at the sems time the thermometer indicated 110° in the second tuhe, 100 in the third, and 90 in the fourth. The temperature in the second and third tuhes, after the water hoiled in the first tuhe, increased 1° a minute; the fonrth less. When the water in the second tuhs was 180°, the third was 170, and the fourth was 140. When the water hoiled in the second tuhs the thermometer indicated 190°, and 140 in the fourth. The water was nne hour and forty minutee longer hoiling in the second tuhe than it wes in the first. This would indicate that long hoilers have not the same espacity in proportion to extent of heating surface as shorter ones.

ENGLISH APPRECIATION OF AMERICAN MECHANICS.—The London *Iron* says: There are meny articles in the production of which greater taste might he cultivated to much advantage, a matter in which, as a nation, we have never excelled, and in respect of which severel foreign countriee are a long way ahead of us. An example which will readily present itself to many minds is to he found in the superiority of the tools which are now so largely imported into this country from America, and which, while remarkahle for their quality and finish, are much less costly than those of Euglish produotion.

Schools to Train Mechanics.

The Philadelphia *Ledger* says: Commissioner Elliot C. Jswett's roport on the manual training school nf Europe, whose prodncts were exhibited at the Paris exhibition of 1878, shows that Russia and France are giving ths most attention to this subject. The technological schools of Russia receive most liberal support from the government, and are msnaged very mnch like military schools, only that tbe pupils learn to hecome civil or mechanical engineers, or skilled workmen and foremen in constrnction shops. Russia has also technical schools and workshops less ambitious than thoss at St. Petersburg, where pupils psy nominal fees for instruction, ahont $15 per annum for tbose who do not board at the institutions. The pupils attend school for fonr and a half hours per day, and work five hours. All of these schools are well equipped with machinery, the instruction appsars to he thorough, and gradnates find no difficulty in obtaining situations as forcmen of other workshops.

Ths Frenoh schools, like those of Worcester, Mass., manufactnre articles for sele, and those of Switzerland are devoted, almost excluoively, to watchmsking. Austria has 80 schools for industrial training, with about 4,000 pupils, but no information is given as to how they are managed. In some of these schools instruction is given at night, ths pupils hsing employed at other work dnring the day. This is the nearest approsch in any of the foreign schools to the experiment in indnstrial training now heing tried hy the Spring Garden Institute of this city. For two years instruction has been given in filing to small classes, with snch good results that this year a complete machine shop, on a small scale, is to he opened, and instruction given to a larger class of pupils in every hranch, except casting, of mechanical work in metals, and possihly in wood. It is not supposed that such schools can take the place of the workshop for training mechanics, but that, under present conditions of doing work mainly hy machine tools, the apprentice attending the school can more readily acquire skill in the handling of tools and a hroad general knowledge of me chanical operations.

A NEW GAS ENGINE.—The popularity of the gas engine, great as it undouhtedly is already, will he much extended hy the introduction of an engine now heing manufactured under Hutchinson's patent by the London Gas Engine Co. The design and arrangements are quite new and original. An oval-shaped iron casting of considerahle thickness, cast in one piece with the cylinder, conceals the piston rod, connecting rod and crank from view, and while imparting to the engine great firmness and steadiness, prevents the risk of accident. Regularity in working is also attained hy the employmeut of a specially heavy fly-wheel. All parts of the "London" engine are constructed to gange, and are therefore interchangeahle and easy of adjustment. The working parts are few in nnmher, and are made of hardened steel, so as to secure the utmost durahility and smoothness of motion. The consumption of gas is low, and can he regulated with great nicety, according to the load on the engine. Coal, petroleum, atmospheric or water gas can he used equally well. A turn or two of the fly-wheel hy hand will set the engine going, and a hoy or lahorer can attend to it. It is, moreover, very compact and portahle. The one-man engine, for instance, occupies a floor space of 2 ft. 4 inchee hy 1 ft. 10 inches, and stands 3 ft. 11 inches high and weighs 4½ cwt.

THE WATCH IN MECHANICS.—Perhaps one of the finest examples of mechanical accuracy is the watch. It is simply marvelous that a little instrument, snhject to constant changes of position, oiled nnce in a year—or perhaps two—receiving its motion from a spring, and the whole contrivance subject to great fluctuations in temperature, should go on marking the time within a few seconds for a year. Or, to look at it another way, that the halance wheel, upon which the accuracy of the motion depends, should, in making 100,000,000 or more vihrations under the adverse conditions noted, have failed hy only a trifling number to have mede exactly whet it should have done. The watch, perhaps, of all machines, is the finest exsmple of what persistent effort in the direction of perfection mey accomplish, and it is worthy the c nsideration of the mechanic ss an example of the adeptation of means to the end in view.—*American Machinist.*

LUBRICATING HEAVY BEARINGS.—In a recent foreign invention for luhricating heavy hearings the oil ie pleced over the shaft which is to he luhricated. A spindle is driven hy an arm and a little hand. This spindle is iu the upper part of the hox and inside, the box contains a worm which runs into a spur wheel. A pin on the spur wheel plays in the slotted arm of a double-ended lever. The ends of this lever are shaped like a spoon. This spur wheel with the pin is driven hy the worm, and at every revolution dips one end of the lever—the spoon-shaped end—and lifts the luhricating end, whatever it may he. When this end containing the material is lifted higher than level with its center, the oil flows from the spoon towards the middle of the lever and down through a hole which leads to the oil holes of the hearings.

ENGLISH steel castings are made hy some firms from old files, in connection with other material, and are said to he eound and very etrnng. It ie said that the excess of carhon in the stock is found no disadvantage.

SCIENTIFIC PROGRESS.

Proposed Storage of Electricity.

It has been suggested that Faure batteries he so connected with lightning rods as to accnmulate the electricity of storm. In this way it is thought a vast amount of electricity might be stored for mechanical uses, "with results exceeding anything evsr dreamed of in perpetual motion." To this plan the *Scientific American* snggests several objections, as follows:

In the first place an electrical condenser would he hctter adapted for the storage of the high tension cnrrents developed in storms than the Fanre battery is. The metal plates snd acidulated water of the Fanre hattsry would form so good a conductor for lightning that very little chemical work would he done in it; and it is this chemical work by the electric current wbicb "charges" the battery, snd thns prepares it fo1 the subsequent redevolopment of electric energy under proper conditions. Experimsnts which we have made with the high tension cnrrents developed hy a Holtz machine show that such currents do have an sppreciahls effect upon the Faure hattery, hut the quantity of energy stored is comparatively very small.

By the use of condensers lightning might he stored, hut such high tension electricity is as ill adapted for the opsration of mechanical motors as dynamite is as a fuel for the steam engine.

Even if the sudden and violent energy of lightning could all he locked up hy chemicel action, and subsequently redeveloped in a quantity current, as in the Faure hattery, the quantity of electricity to he had from storms is too small to pay for storage.

In one of his experimental investigations, Faraday determined that to decompose a grain of acidulated water an electric current powsrful enough to keep red hot a platinum wire one one-hnndred-and-fourth part of an inch in thickness, must he sent through the water for the spacs of thres minutss and three-quartere.

This quantity of electricity he shows to he equal to 800,000 charges of a Leyden battery of fifteen jars, esch contsining 184 square inches of glass coated on hoth sides, eqnivalent to a "powerful flash of lightning." In other words the quantity of electricity involved in the lightning stroke—and it is quantity alone that is available for mechanical use—is very small.

In another connection Mr. Faraday demonstrates the fact that the electricity which decomposes a certain quantity of matter—a grain of water, for example—is exactly equal to that which is evolved by the decomposition of the same mattsr.

An ordinary galvanic cell, therefore, must evolve as largs a quantity of electricity as would suffice for a respectahle storm. For so smell a quantity of electricity it ohviously would not pay to eet an expensive trap in the form of Faure batteries and lightning rods, even if the electricity of storms could all he captured that way. It would he vastly cheaper to generate the same quantity of electricity hy means of galvanic hatteries; and there are many cheaper sources of mechanical energy than the galvanic hattery is.

LARGE PHOTOGRAPH.—The wonders and possihilities of photography are constantly increasing. The latest achievement in this direction is recorded as follows: A photograph, prohahly the largest ever printed on a single sheet of peper, is now on exhihition in the art gallery of the American Institute, Now York. It ie not uncommon to see several views which have been separately printed on smsll shsets of paper and pasted together to make a panorama of large industrial works, etc., hut this remsrkahle specimen was printed from seven nsgatives on one sheet of peper, and covers an area of over 10 ft. in length hy ahout 18 inches in hight. It is a panoramic view of the Centsnnial grounds in Philadelphia, and eo perfectly are the negatives joined, that it is impossible to locate the joints. Were it not for the announcement of the exhihitor that it was printed from eeven negatives, no lay observer would imegine that it was other than a single view printsd from a eingle negative. Duplicates of this picture have heen sold at very high prices as sample works of photo art. One was presented to Queen Victoria, and is seid to occnpy a conspicuous place in the royal gellery. This work is from the gallery of F. Gutekunst, No. 712 Arch street, Philadelphia. His exhihit includes other fine specimens. A notahle one is another picture five ft. long hy 18 inches high, also on a single sheet.

AN ANCIENT GREAT LAKE IN THE WEST.—The last quarterly report of the Kensas State Board of Agriculture contains the following: "In the geological developmentit is conceded hy scientists that the eastern portion of Kansas, a portion of Nehraska, Southern Iowa, Northern Missouri, etc., was once covered hy a vast fresh water lake, and this hody of water received numerous rivers and smaller streams; and that their turhid waters deposited a sediment, varying from four ft. to 150 ft. thick."

DISCOVERY OF EXTENSIVE PINE FORESTS.—The recent exploration party of Col. Mercer up the Spanish river, in the province of Ontario, is said to have discovered vast pine forests, conteining upward of 24,000,000,000 ft. of a superior quality of pine lumher, with facilities for getting it to market equal to the hest.

Spontaneous Oxidation of Mercury and Other Metals.

Mr. Berthelot has suhmitted to experimental verification the question so long discussed without final settlement, whether mercury dissolves the oxygen of the air and oxidizes, even at ordinary temperature. Perfectly pure mercury was placed in a retangular dish of porcslain exposing a surface of 500 sq. cm. ahout, and covered loosely with paper. After 48 hours at a tempsrature of 10°, the metal yielded a slight pellicle to a tnhs of glass passed over it. This waa removed from day to day, and showed on analysis the presence of mercnrious oxids. Ths slow oxidation of pure mercnry in contact with air can no longer he donbted. The same is true of iron, zinc, cadmium, lead, copper and tin. Now thermic data explain this phenomenon. For each equivalent of oxygen fixed by the metal, iron (rnst) evolves 31.9 calories; tin, 34.9; csdmium, 33.2; zinc, 41.8; lead, 26.7; copper, 21.0, and mercnry, 21.1.

This oxidation in the air, howsvsr, is not appreciable in the case of mstals whose heat of oxidation is small. Silver, for exampls, evolves only 3.5 calories per equivalent of oxygen ahsorhed. The fact that a resction hegins spontaneously only in the case where a notahle evolution of heat tskes place, is a result not unfrequently observed; seeming as if there was a certain resistance to he overcome, a certain preliminary work to he accomplished in order to determine the reaction. But this action hecomes more prompt and more easy when an auxiliary agent is made to intervene capahle of combining, with evolution of hsat, with the substance at first formed; so that the total energy in action hecomes greater.

This is the action called in early times predisposing affinity. If, for example, mercnry ho placed in a flask and hydro-chloride gas be mixed with the air in contact with it, ths walls of the flask will he covered after a time with mercurious chloride. Now, hydrochloride alone does not act on mercury at all under these circumstances; the oxygen of the air intervenes, ths reaction $Hg_2 + HCl$ gas, $+ O = Hg_2 Cl +$ HO liquid evolving 53.4 colories. So silver, which is not acted on hy oxygen alone, is easily converted into chloride in presence of hydrochloride gas in addition, the reaction $Ag + HCl$ gas $+ G = AgCl +$ HO liquid evolving 41.7 calories. So silver in contact with air is attacked hy a solution of sodium chloride, copper hy hydrochloric and acetic acids, led hy acetic acid, etc. In the case of mercury and hydrogsn sulphide, in presence of air, the hydrogen is oxidized, the sulphur finely dividsd is precipitated and acts upon ths metsl. The same mechanism taks place with silver.

ARE MEN'S HEADS GROWING SMALLER.—A correspondent of *Nature* says that an opinion is prevalent in the hat trade that the sizs of men's heads has undergone a decrease within the last 30 or 40 years. It is held that heads generally are now fully two sizes smaller than 40 years ego. A head of more than 24 inches in circumference ie now quite a rarity, while thousands of hats are made of 21 inches. There are some, however, who think that the diminution is more apparent than real—that it is observed mostly among grooms and men of that class in the sooial scale, and that it is possihly traceable to alteration in the style of hair-cutting or of wearing the hat.

BALLOON SOUNDINGS.—Aeronauts have a nnique method of taking "sonndings" to learn their distsnce from the earth when they are heing swept rapidly along in the night. According to the Signal Service officer who recently accompanied Prof. King on his perilous journey from Chicago to Wisconsin swamp, a loud shout is given, and then the seconds are counted until the echo from the ground is heard. The hight is estimetsd hy the time required for the return of the sound.

CELLULOID.—A new cslluloid is said to he ohtained from well-peeled potatoes, which are treated for 36 hours with a solution of eight parts of sulphuric acid in 100 parts of water. The mass is dried hetween hlotting paper and then pressed. It is further stated that in France smoking pipes are manufactured with this new material which are quite equal to meerschaum. By heavy pressure the meterial acquires such a hardness that hilliard halls csn he manufactured from it.

NEW TANNING PROCESS.—A process of tenning with hichromate of potash has recently heen disoovered, and a company, which inoludes a numhsr of capitalists in New York and some Boston leather dealers, has hought chrome mines in California, and will manufectnre the hichromate and carry on a tanning business.—*Springfield Republican.*

HARDENING STEEL.—For hardening thin steel articles Dr. Hartman recommends: 4½ qts. of train oil, 2 lbs. of heef tallow, ½ lb. of heeswax, and 1 lb. of resin. The exact amount of resin, however, is a matter of experiment, always hearing in mind that the greater the proportion of resin the higher the temper. Another mixture recommended on the same authority, is 95 qts. of spermaceti oil, 20 lbs. of tallow, 4½ qts. of neats-foot oil, 1 lb. of pitch, and 3 lbs. of resin. The pitch and resin are melted, the other ingredients added, and the whole heated until it will ignite if a hlaze is hrought in contact with it, when it is covered and allowed to cool.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 1.		Week Ending Dec. 8.		Week Ending Dec. 15.		Week Ending Dec. 22.	
Alpha	2.90	2⅞	3	2¾	3	2¾	2.95	2.80
Alta	4.55	4.10	4.30	3⅜	4	3.90	4¼	3.25
Andes	1.20	1	1.30	1	1.10	1	1.90	85c
Albion	1.95	1⅜	1.95	1.90	1.90	1⅜	1.95	1 60
Argenta	....	....	....	....	....	....	....	....
Addenda	....	....	....	....	15c	5c	10c	....
Belcher	3.55	2.10	2¼	1.60	1.90	1.65	1.90	1⅜
Belmont	....	....	40c	35c	35c	....	60c	....
Best & Belcher	8¾	8	9¼	7⅞	8⅞	8½	8⅝	7⅞
Bullion	1¼	1.15	1.30	1.20	1.20	1.15	1.65	1⅛
Bechtel	45c	25c	45c	25c	20c	....	20c	15c
Belle Isle	15c	....	....	....	....	....	....	....
Bodie	4.60	4⅛	4¼	3⅛	3.10	2.60	3⅛	3
Benton	85c	75c	80c	70c	70c	65c	80c	70c
Bulwer	2½	2.30	3	....	2.65	2½	2⅞	....
Boston	15c	....	....	....	40c	....	50c	....
Black Hawk	5c	....	5c	....	....	....	....	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	25c	20c	25c	10c	10c	....	10c	....
California	55c	50c	65c	45c	50c	40c	50c	40c
Challenge	60c	....	70c	50c	70c	60c	60c	5.c
Chollar	1.65	1.45	1⅞	1⅛	1⅛	1.30	1.45	1.30
Confidence	2.40	2.20	2½	2	2½	2.30	2½	2¼
Con Imperial	15c	10c	10c	....	5c	....	10c	....
Con Virginia	1⅞	1⅛	1.90	1⅛	1.60	1⅛	1.60	1.30
Crown Point	1.40	1.15	1.35	1	1.20	1.05	1⅛	1.05
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1⅛	1.15	1⅛	1	1.80	1⅛	1⅛	1⅛
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1.90	1.80	2.50	2.40	2.40	2.35	2½	2.45
E. Mt. Diablo	60c	40c	60c	50c	50c	30c	40c	35c
Eureka Con	16½	16	15½	14	13⅞	11	14	13
Exchequer	1.20	1.05	1.10	1	1.05	95c	1.10	1
Endowment	....	....	....	....	....	....	....	....
Grand Prize	40c	20c	25c	20c	15c	5c	....	....
Golden Gate	2¾	2⅛	2⅞	2.40	2⅞	2¼	2⅛	2.05
Goodshaw	50c	40c	40c	....	25c	....	25c	....
Gould & Curry	6⅜	5⅛	6⅝	5	5⅞	5⅛	5⅛	4⅛
Hale & Norcross	3	2.60	2.95	2.15	2.45	2.30	2½	1⅛
Head Center	....	....	....	....	55c	....	50c	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	20c	10c	25c	20c	25c	15c	....	....
Justice	80c	60c	75c	60c	70c	60c	75c	65c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	1⅛	1	1	90c	1	45c
Kosmith	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	20c	15c	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2	....	2	....	....	....	....	....
Martin White	....	....	3	....	3	2⅜	3.05	2⅛
McClinton	....	....	....	....	....	....	....	....
Mono	1.40	1.30	1.30	90c	80c	70c	80c	60c
Mexican	9⅛	7	12	9⅛	11⅛	10⅛	10⅞	9⅜
Mt. Diablo	6⅜	....	6⅜	6⅛	6⅛	6	7	6⅛
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	50o	40c	50c	35c	35c	30c	35c	25c
New York	5c	....	5c	....	5c	....	....	....
Northern Belle	11⅜	....	11⅛	10⅛	10⅜	9⅜	9⅝	9
North Noonday	30c	25c	35c	....	....	....	35c	30c
Navajo	....	....	....	....	15c	....	20c	15c
Occidental	15c	....	1	....	1	....	....	....
Ophir	6⅞	5⅛	7⅜	6	7⅛	6⅜	6⅜	6⅛
Original Keystone	....	....	....	....	....	....	....	....
Overman	2.20	1.85	2.15	1.55	1⅞	1.70	1⅛	1.30
Oro	25c	20c	25c	20c	20c	15c	25c	15c
Paris	....	....	....	....	....	....	....	....
Potosi	1.60	1.40	1.60	1	1 80	1.10	1⅜	1.40
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	20c	....	5c	30c	....	....	....	....
Savage	3.05	2.80	3⅛	2.90	....	2⅜	2.90	2
Seg Belcher	6⅛	....	6⅝	5	5	....	5	....
Sierra Nevada	11⅜	9⅜	11⅜	9⅜	11⅛	10⅜	10⅞	9⅛
Silver Hill	20o	10c	25c	20c	35c	20c	30c	25c
Silver King	19⅜	19⅛	20	19⅞	20	19⅜	19⅛	18⅛
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	1.40	1.10	1.45	1	1.35	1.10	1.35	1.10
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	5c	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	15c	....	20c	15c	10c	....	20	....
Tioga Con	....	....	10c	....	10c	....	....	....
Tiptop	5⅛	5	5⅜	5	5	....	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	14⅜	9⅛	15½	13⅜	18	14⅜	16½	14⅜
Utah	8	6⅜	8⅜	6⅜	7⅜	7⅛	7⅜	6⅛
Ward	....	....	3.60	3	3.70	3.60	3.65	....
Wales	75o	....	....	....	....	....	55c	....
Yellow Jacket	3.95	3.30	4¼	3.40	4.15	....	3½	4.40 3.60

Sales at S. F. Stock Exchange.

Thursday A.M., Dec. 22.

130	Alta	380	Potosi....1.40@1.45
200	Andes....85c	550	Regent....25@20c
130	B & Belcher....7¼	600	Savage....2.05@2
125	Belcher....1⅛@1.80	140	Sierra Nevada....92@10
1135	Bullion....1.30	700	Silver Hill....25c
200	Benton....75c	110	Scorpion....1.10
100	California....40c	55	Utah....6⅛@6¼
415	Con Virginia....1.30@1.35	1100	Union....15¼@15½
10	Chollar....1.30	310	Yellow Jacket....3.60
200	Crown Point....1.10@1.05		AFTERNOON SESSION.
200	Con Imperial....10c	250	Albion....1⅛@1.60
100	Curtis....1.40	90	Bodie....2.60
210	Exchequer....1	270	Bechtel....10c
360	Gould & Curry....4⅛@4½	10	Bulwer....2.65
300	Golden Gate....2.10	200	Eureka Tunnel....2
370	Hale & Nor....1.80@1⅛	200	Goodshaw....25c
100	Justice....65c	100	Head Center....50c
120	Kentuck....50@45c	100	Holmes....25c
270	Mexican....9⅛	100	McClinton....5c
315	Ophir....6⅛@6¼	50	N Noonday....25c
525	Overman....1.30	100	Oro....20c
		50	Silver King....19⅛

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Northern Belle, Dec. 14th, $16,816; for December to 14th, $28,419; Great Basin, 17th, $1,950; Horn Silver, 18th, $32,500; Ophir, 14th, $21,000; Northern Belle, 14th, $4,621; Day, 12th, $7,750; Contention, 14th, $13,465; Standard. 12th, $42,338; Northern Belle, 14th, $5,753; Silver King, 14th, $23,000; Regent, 16th, $4,700; Savage, $9,518; Bodie, 19th, $6,-018; Contention, 16th, $16,853; Northern Belle, 17th, $7,038; Head Center, 18th, $9,145; Horn Silver, 17th, $15,000; Jay Gould, 17th, $4,400; Pascoe, 17th, $1,100; Hananer, 17th, $2,610; Germania, 17th, $1,250; Mayflower, 13th, $3,-816; Hanauer, 13th, $2,250; Horn Silver, 13th, $7,500; Mammoth, 13th, $1,677; Barbee & Walker, 13th, $1,708; Bullionville, 13th, $4,-917; Hanauer, 14th, $2,460; Bullion, 4th, $2,-450; Horn Silver, 14th, $35,000; Barbee & Walker, 14th, $2,376.

New claims are to be opened next season on the Klamath, and shafts for prospecting are now being sunk. Empire Bar, at the mouth of Empire creek, will be worked on an extensive scale, lumber being now hauled, of which over 10,000 ft. bas already been delivered.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Albion Con M Co	Nevada	9	30	Nov 25	Dec 29	Jan 19	D B Chisholm 327 Pine st
Alexander M Co	Neavda	1	3 00	Oct 31	Dec 3	Jan 4	A B Cooper 328 Montgomery st
Alta S M Co	Nevada	22	50	Dec 16	Jan 20	Feb 9	W H Watson 302 Montgomery st
Betty O'Neal M Co	Nevada	2	25	Nov 14	Dec 19	Jan 5	R W Heath 318 Pine st
Belmont M Co	Nevada	30	15	Nov 11	Dec 19	Jan 16	J W Pew 310 Pine st
Bodie Con M Co	California	1	50	Dec 6	Jan 14	Feb 13	W H Lent 309 Montgomery st
Bechtel Con M Co	California	8	25	Dec 3	Jan 9	Jan 30	W H Lent 309 Montgomery st
Black Hawk G M Co	California	13	10	Nov 9	Dec 17	Jan 4	H A Charles 419 California st
Caledonia S M Co	Nevada	38	25	Dec 6	Jan 7	Jan 26	R Wegener 414 California st
Hale & Norcross M Co	Nevada	72	75	Dec 21	Jan 25	Feb 16	J F Lightner 309 Montgomery st
Holmes M Co	Nevada	3	10	Nov 8	Dec 12	Jan 3	E A Holmes 318 Pine st
Kentuck M Co	Nevada	17	30	Nov 23	Jan 3	Jan 23	J W Pew 310 Pine st
Lady Bryan S M Co	Nevada	6	25	Dec 5	Jan 10	Jan 29	C V D Huhhard 310 Pine st
Mono G M Co	California	15	50	Dec 5	Jan 10	Jan 31	W H Lent 309 Montgomery st
Navajn M Co	Nevada	15	15	Dec 3	Jan 17	Feb 6	J W Pew 310 Pine st
Nor h Standard G & S M Co	Cal	2	10	Nov 30	Jan 3	Jan 21	C V D Huhhard 310 Pine st
Oro M Co	California	10	10	Nov 16	Dec 17	Jan 4	W Stuart 320 Sansome st
Pinal Con M Co	Arizona	1	25	Nov 19	Dec 27	Jan 16	W W Traylor 309 Montgomery st
Potosi M Co	Neva'a	7	50	Nov 11	Dec 14	Jan 4	W E Dean 309 Montgomery st
Savage M Co	Nevada	48	50	Nov 3	Dec 6	Dec 27	E B Holmes 329 Montgomery st
Seg Belcher M Co	Nevada	20	1 00	Dec 5	Jan 6	Jan 26	G D Edwards 414 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Buckeye M Co	California	4	50	Nov 10	Dec 19	Jan 19	W H Lowden 213 Sansome st
El Dorado W & M Co	California	19	75	Nov 12	Dec 22	Jan 16	R M Welch 524 Sacramento st
Horseshoe M Co	Arizona	1	02	Nov 30	Jan 4	Jan 23	J H Sayre 330 Pine st
Inwa M Co	Nevada	15	05	Nov 9	Dec 17	Jan 5	C C Leavett 411½ California st
Santa Anita M & M Co	California	2	02	Dec 14	Jan 16	Feb 2	J B Titus 34 Kearny st
University G M Co	California	10	10	Dec 13	Jan 19	Feb 9	W L Oliver 328 Montgomery st
Wide Awake Prospecting & M Co	Arizona	15	10	Dec 6	Jan 12	Jan 30	C Hilchrandt Chronicle building

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Argenta M Co	Nevada	E M Hall	327 Pine st	Annual	Jan 9
Bullion M Co	Nevada	J M Brazell	328 Montgomery st	Annual	Jan 12
Hillside M & M Co	Nevada	F Frankenthal	330 Pine st	Annual	Jan 13
Ivanhoe Con Q M Co	——	J Hausmeister	212 Pine st	Stockholders	Jan 2
Pinal Copper Co	Arizona	Geo T Shaw	340 Fourth st	Annual	Dec 27
South Hite G M Co	——	F A Berlin	420 Montgomery st	Annual	Jan 9

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	California	W Letts Oliver	——	20	Dec 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Dec 12
Father De Smet M Co	Dakota	H Dean	New York	50	Oct 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Dec 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Nov 15
Silver King M Co	Arizona	J Nash	315 California st	25	Dec 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Dec 12
Western M Co	California	C S Curtiss	309 Mn atgomery st	75	Dec 22

The Mining Share Market.

Stocks bave been down in the mouth during the later part of the week. Assessments levied by 22 mining companies become delinqneut dnring the current month, the aggregate amonnt called for being $380,150, the smallest of any monthly aggregate during the year 1881. Of the assessments levied $269,500 is on account of Nevada mines, $80,650 on account of California mines, and $30,000 on account of Arizona mines. During the year 1881 the various mining companies have levied 364 assessments, aggregating $9,385,160.

The Savage mine shipped four bars of bullion valued at $9,518, the other day. This is the first shipment of any importance in quite a number of years. It is tbe proceeds of some low grade ore, which is being extracted from the upper levels, and which is represented to yield a small profit. The ore is being reduced at the Santiago mill, and the clean np for the month, which will give a still larger amount of bullion, has yet to follow.

In the Savage, the No. 1 drill hole (according to the *Enterprise* of the 21st), which probably went into the roof of the incline, is discharging water to its fnll cspacity. The hole is 2¼ inches in diameter, and the water flows out of it with considerable force. Just where this hole strikes, as regards the bottom of the main Savage incline, no one knows. At first it was thonght it had gone too low and was in the rock under the floor of the incline. Then, on consaltation with the men who ran the hole, it was thonght the drill might have struck into the bottom of the incline. The reason the men in charge thought so was, that at the hight of ahont 94 ft., they fonnd the drill "running light;" that is to say, rnnning as thongh it was in contact with nothing. In order to satisfy themselves, they forced the drill npward without revolving it in the usnal way, and found that they were able to pnsh it up into some kind of soft material. Under these circnmstances the hole was abandoned, bnt it soon began to discharge water to its full capacity. Bnt that the water lowered very little in the bottom of the main incline, it wonld have been thonght that the incline was tapped. As it was, and seeing that the water in the incline remained ahont the same, the company arrived at the conclnsion that the drill hole went above the incline, and was discharging live water.

Geographical Society.—Capt. Hooper, of the U. S. Steamer *Corwin*, a few days since, delivered a very interesting lecture concerning his trip to the Arctio and the landing on Wrangell Land. The paper was read hy Prof. Davidson, and the interest greatly hightened hy excellent stereopticon views thrown on a large screen. These views were prepared, and the stereopticon portion of the lecture arranged by Prof. James, who is with I. W. Taber, tbe well-known photographer. The same gentleman managed, with equal ability and skill, the stereopticon for Lieut. Gorringes' lecture before the Academy of Sciences. After attending these, many persons will not hereafter want to attend a lecture without the accompaniment of stereopticon views.

Meetings and Elections.

Winthrop M. Co., Dec. 15. Directors—John Spruance, (President), S. L. Stanley. (V. P.), A. C. Springer, J. M. Magner, C. W. Jones. Halleck Wright, Secretary.

North Star M. Co. Directors—R. A. Robinson, (Prssident), A. Summerfield Jr., Treasurer, J. W. Farren, A. Quinn and O. Breslin. J. T. Barry is Secretary, and W. D. Farren Superintendent.

Mount Diablo M. Co., Dec. 19. Directors—H. H. Allen, President; W. E. Norwood, Vice-President; R. W. Heath, Secretary; W. H. Shockley, Supt.; Bank of California, Treasurer.

Gould & Curry, Dec. 14. Directors—W. S. Hobart, A. B. Hull, A. Hayward, Robert Sherwood, Wm. Kohl, S. Heydenfeldt, Geo. Congdon. At a meeting of the Board of Directors the following officers were elected: President, W. S. Hobart, Vice-President, A. B. Hull; Secretary, A. K. Durhrow; Supt., H. Penoyer.

The following figures from the Secretary's statement will show the status of affairs:

Receipts.—Cash on hand Nov. 30, 1880, $15 192.53; assessment No. 30, (50c) $54,000, assessment No. 40 (50c) $54,000 - $108,000. Mine account: supplies sold, $32,111.06, machinery sold, $1,000—$33,111.06. Balance cash indebtedness, $13,031 40—$160,934.09.

Dishursements. — Minn: sundry supplies, $5,075.36; wood, $25,913.08; labor and salaries, $12,463; C. & C. and B. B. joint shaft, $113,251; general expenses (Virginia) $324.10; advertising. $574 50; stationery and printing, $344.25; office and general expenses (S. F.) $1,338 80; exchange, $024.50; interest, $265.49; taxes, $2,430.63; legal expenses and adverse claims, $3,000; joint fan account, $8,329 68. Total, $160,934.09.

Idaho Quartz Mine.—At the annual meeting of this Nevada county mine held on the 12th, the following were elected as a Board of Trustees to serve for the ensuing year: John C. Coleman, Edward Coleman, George W. Hill, Eugene C. Creller and M. P. O'Connor. The Board was organized by the election of Edward Coleman, President; Eugene C. Creller, Vice-President; John C. Coleman, Treasurer; George W. Hill, Secretary. Edward Coleman was re-elected Supt. We reserve comments on the report until next week.

"The Californian."—This popular home magazine comes out in the January number (jnst received) in a superior quality of calendered paper, and with improved typographical appearance. A glance at the tablo of contents shows the magszine deals with live topics. Walter Frear contribntes a paper npon the lahor system which prevails in the Hawaiian islands. B. B. Redding has an able contribution, entitled "Immigration, and How to Promote it," and C. T. Hopkins furnishes an article upon the "Restoration of American Shipping." James O'Meara continues his series of biographical sketches in an article on the frontiersman, Capt. Anhrey. In the way of lighter literature, Miss Shinn has a charming Christmas story, entitled "Friday's Child." Miss Sargent, danghter of Senator Sargent, contribntes a powerfnl and original tale, "We Wi Ping." "Coh-weh and Crnsty" is continued. There are also poems hy E. R. Sill, B. P. Wall and Chas. H. Phelps; ahle reviews upon late publications; "Outcroppings," hy Lock Melone, etc. Mr. Chas. Phelps, who has been sole proprietor since the June number, has creditahly maintained the work, and has the good wishes of a host of friends of the magazine for his continned success.

Mechanical Lecture.—The lecture at Capt. McNevin's hall this week before the apprentices and yonng mechanics was delivered hy S. H. Wheeler. Subject, "Construction of Boilers." Next week Capt. McNevin will deliver a lecture on "Color Blindness," a subject now attracting attention, and one of great interest.

The Marqnis of Lorne has decided to remain in Canada another three years as Governor-General.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Sutter Creek.—Amador *Dispatch*, Dec. 17: Work at the Con. Amador is progressing very satisfactorily in the north and west drifts. There was some very rich ore taken from the 800 level, at the Mahoney mine this week.

CALAVERAS.

Work Commenced.—Calaveras *Chronicle*, Dec. 17: Preparations for prospecting the famous Lamphear mine, have commenced. Mr. H. F. Lambert, the energetic Supt., is pushing operations. The road to the mine has been repaired, and the grading for the erection of the hoisting works has also been started. All the teams that could be engaged in this vicinity have been pressed into service to deliver the required lumber on the ground. Mr. John Rider, an experienced millwright, has been engaged, and Messrs. Donnelly & Co., foundrymen of Sutter Creek, Amador county, have contracted to supply the machinery. Work is progressing rapidly and it will be but a short time before work in the mine will be commenced.

Corral Flat Mine.—We visited the Corral Flat mine one day this week and besides a look at the steam hoisting works and the mill, we were afforded an opportunity to go down in the mine and through the works where the force of men was at work At the bottom of the shaft we were conducted through the main drift, extending nearly due north, a distance of 275 ft. This drift is still being advanced through a solid gravel bed. Leaving the main drift we proceeded to where the operation of "breasting" was going on in a spendid body of gravel exceedingly rich, as we were readily convinced by the discovery of fine specimens of gold imbedded in the gravel in the face of the "breast." The extent to which this gravel bed has been worked in former years has been greatly exaggerated. There is a vast body of it yet remaining to be worked, as can bs seen hy an inspection of the works, and it is unquestionably rich.

EL DORADO.

Bear Creek.—Georgetown *Gazette*, Dec. 16: The late rain in this locality bas again brought the miners to thn surface. It is the belief of most every one here that mining is now being about as vigorously executed as it was in the "golden days of '49." There are six hydraulic mines in our camp, besides numerous claims that are being run by pick and shovel. Mr. Terry is now fitting up his hydraulic mine on Slug gulch. There seems to be quite a stir here at present about quartz. There are several developments now being made, of which we will be ablo to give an account in our next epistle. The Twin claim on Travers creek, is now being fitted up by its owners who are energetic and practical miners. We expect to hear of something extra from this mine before long, judging from the prospects we happened to see from it not long since Edwin Demuth and Hiram Ackley have been rigging up a hydraulic on Fair Play Canyon.

A Rich Strike—*Mountain Democrat*, Dec. 10: A very rich strike was made in the Bowker mine, Kelsey township, last Saturday morning. This strike was not in or directly connected with the fine development from which the recent clean-up was made The latter is near the surface and adjacent to the hanging wall, being a body about 20 ft thick of very profitable ore, but in which the gold is quite fine, disseminated throughout the quartz and little or none is perceptiblo to the naked eye. The development of last Saturday was made in a drift that is being run hy contract to the southward along the main ledge from the tunnel that was recently run across the ledge from the near vicinity of the mill Tbo ledge, where this tunnel crossed it, was 80 (not 8, as the telegraph reported it) ft thick. After this tunnel was run across the ledge, drifts were started in both directions. In the south drift, about 20 ft from the main tunnel, a heavy blast was put in about half past one o'clock last Saturday morning, and when the contractors came to examine its effects their eyes were gladdened by a dazzling sight. The rock thrown down hy the blast, and the face of the drift back of it, were literally studded and plastered with free gold. The full extent of this strike has not yet been ascertained, but a considerable quantity of thousand dollar rock has been taken out, and there is every indication that this pay streak is extensive. Independent of this most exhilarating find, recent developments had been of such an encouraging character that preparations were being made for setting up 10 additional stamps in the mill, a new rock-breaker, and other improvements.

INYO.

The Southern Country.—Bodie *Free Press*, Dec. 20: Si Ryan says that things are booming in Inyo county, where the mining business is picking up. Several transfers bave recently been made, and capital is being brought into the country. Independence, the county seat, is busy during court times. The climate there is an improvement on what we have here. There is no snow, except on the mountains. Bishop Creek is growing in importance, and the residents feel confident that next summer there will be a mining excitement thereahouts. The grass is green at this season, and the weather delightful.

MARIPOSA.

Local Notes.—Mariposa *Herald*, Dec. 17: The new compressor at the Hite mine is now in full operation and working satisfactorily. Louis Isola, of Coulterville, was in town Sunday evening and reports his mine in a promising condition. The hoisting works at the Compromise mine, near Bull creek, Coulterville district, have been started up and are now running at full blast. Work at the No. 9 mine, near Hornitos, goes steadily ahead, and is paying very well so far. The mine bids fair to replace the Washington. John Schroeder has completed laying the pipes for 800 ft in length conveying water to his placer mine in Saxon's creek. As soon as there is a little more rain, lively operations will commence at this mine. As we stated last week, all work has stopped on the Washington mine, near Hornitos, some of the pumps have been withdrawn, a portion of the machinery hauled away, the store and bar sold to the No. 9 Co., and the place has a graveyard looking appearance. The mine on Sweetwater owned hy Peter Gordon, William Simpson, Fred Schlageter and D. F. Egenhoff, is now being prospected and worked. They are also crushing ore in an arastra with most favorable prospects. A tunnel on the vein has already reached a distance of 100 ft. There is a large amount of machinery and lumber being hauled to the Mt. Gaines mine, near Hornitoe. The mill at the mine was burned down several years ago, and the lumber is to rebuild the mill, then the machinery will be replaced, after which work will be resumed on the mine. It is a good mine. During the past 2 weeks we have noticed a large amount of machinery, loaded on freight wagons, pass our office, and are informed it is all for the Modesto S. M. Co.'s works, which are situated a few miles below town. There is no doubt but that there will be interesting developments made at these works as soon as the Co. get their machinery in working order.

Hornitoe.—Cor. Mariposa *Gazette*, Dec. 17: The Yosemite Co. has purchased the old Gaines mine and property, the machinery for the hoisting works having already been shipped from below, and work will start up this week or the first of next; thus many of the old hands thrown out of employment by the shutting down of the Washington mine, will find employment close at home. There is now about 50 men working at the Yosemite mine and mill, and as soon as a new shaft can be sunk on the Gaines, there will be as many hands put on as can be worked to advantage. The Yosemite mine is paying a dividend, and has done so every clean-up since Frank Thorn has had the management of its affairs, the last clean-up being the largest. I understand that the parties working the Quartz Mountain

mine have leased the Campidonico mill, and will crush their rock there, or at least enough to prospect it. The old silver lead near the Washington mine is paying well. So much for the mines.

DILTZ MINE.—The news from this mine is of a most cheering character. Capt. Diltz is running a breastwork upon the mine of 110 ft in length, by from 40 to 60 ft in depth and conveying the dirt a short distance by cars to the dump and flume, where it will undergo the process of washing as soon as there is sufficient water. The breastwork mentioned shows 30 separate stratas of gold-bearing quartz of various widths radiating out from the main vein, some of which is decomposed and shows rich with free gold. About 30 tons of dirt per day is taken to the dump, and about the same quantity of pay-rock is piled up for milling purposes. This extensive work is all abreast of the main vein, which is left unmolested for the present. The whole hill appears impregnated with gold, as not a pan of dirt can be found but will show colors of gold. The value of this mine is being appreciated more highly, as the work progresses and new developments made.

RED BANK.—The hydraulic process of mining went into full operation on Monday last at the Red Bank, Merced river. The late rains have afforded sufficient water for present purposes, with a probability of its being continued through the winter season. This work, which is under the management of Col. Swalley, gives employment to about 20 men, and is of material benefit to that locality. Should the "big clean-up" which is expected to take place sometime during the spring result favorably, of which there is little doubt, the Co. will order lumber for the large flume which has been in contemplation, to extend from the Benton dam down the river a distance of two and a half miles. This would afford water all the year round.

MONO.

BODIE.—*Free Press*, Dec. 20: The mining situation remains about the same as last reported, with the exception that an improvement is noticeable in the Boston Con. mine. Quite recently a ledge of importance was exposed and everything points to its improvement as advance is made. Nothing more has been reported regarding the strike in Concordia. It is stated on good authority that a development of importance has been made in that property. Such an event is to be hoped for, and its existence would help the entire south end of the district. The Standard Con is still sinking its shaft, while good ore is being extracted as usual. Owing to a break in the Bodie tunnel mill that Co. has crushed but little ore of late. The pulverizer is to be replaced with stamps as the ore is too hard for the pulverizer to crush.

NEVADA.

MINING CAVE.—Nevada *Transcript*, Dec. 15: A gentleman, who came down from the upper part of the county, night before last, gives us an account of another big cave that occurred during the storm of last Saturday night at the Blue Banks mine, Moore's Flat. An immense section of the ridge came tumbling down upon the bedrock, burying everything beneath it. Both the sluice and the drift tunnels were choked up, a corner of a house was swept away, and an immense amount of damage was done. It is said that some of the sliding matter found its way nearly to the river before stopping. This disaster will prevent further operations at the mine for some time, and entirely cut off the gold supply for the winter it is expected. Last September, it will be remembered, another big cave occurred at the same claim, and the owners were getting the debris removed when the last one came. The Blue Banks ordinarily gives employment to a large number of white men who will now have to seek elsewhere for a livelihood. Since writing the above, we have been told that the Boston mine, adjoining, also suffered from the slide, but not so seriously as the Blue Banks.

MINING ENTERPRISE.—*Tidings*, Dec. 17: Mr. Cornelius Riley has leased the Stockbridge and Ford and Riley mines, situated on Massachusetts hill, and in a short time will commence work on the ledges. These mines have a good history and the prospective opening of them is looked upon with interest in mining circles of Grass Valley. Mr. Riley has known all about this ground for many years, and knows what he is about.

PACIFIC CON. MINE.—The directors of the Pacific Con. M. Co. held a meeting Wednesday, and resolved to go ahead with work on the property of the company. The mine is down on Wolf creek, in the famous Allison Ranch vicinity.

MINING AT CHAPMAN RANCH.—*Transcript*, Dec. 20: Chapman Ranch is now one of the liveliest quartz mining localities in this district. At the Underwood & Murphy mine from 10 to 12 tons of ore are being extracted daily, and hauled to the Deadwood mill for crushing. Mr. Green, owner of the Seventy-six mine, has bonded it to a San Francisco company who announce their intention to erect hoisting works that will be run by water power. The Lizard claim, parallel to the Seventy-six, and adjoining the Underwood & Murphy on the north, is owned by D. Leahy. The croppings prospect well and a shaft is being sunk on the ledge. The Virginia City Co. are taking out pay ore regularly. They have it milled at the Deadwood and the Pioneer.

PLUMAS.

ELIZABETHTOWN.—Crescville *Bulletin*, Dec. 14: Before selling their mine at Elizabethtown to Messrs. Corbin & Manson, the former proprietors in working 230 lineal ft, took out $27,000. Messrs. Loring & Leavitt had very rude machinery and limited means. The present owners of the property first prospected the ground thoroughly; being fully satisfied with the result, pumps and hoisting machinery have been put up, that will permit of working the mine to the greatest advantage. Good, comfortable buildings have been erected, and everything done that experience and foresight prompted for the most energetic prosecution of the work. The last shaft put down was continued into the bed rock about 20 ft. This gives place for a good sump, and is also a solid bottom for the shaft. About 6 ft above the sump a tunnel was started off; this has now gone through the rock and is in the gravel. The work in this tunnel will be pushed as far to each direction as will be economical to carry the dirt, when a new shaft will be sunk and the same process repeated until the whole ground is worked out. The depth is only about 60 ft, so sinking a shaft is not very expensive. A flume 4 ft wide and 2 ft deep has just been laid from the upper end of the claim down past the two shafts now being worked. This will easily carry all the water not needed for washing, and keep the works comparatively dry.

SIERRA.

RICH STRIKE.—*Mountain Messenger*, Dec. 17: We are informed that at the Alaska quartz mine, Pike city, the company has struck a veritable bonanza, as rich, in fact, as the celebrated Rainbow mine, of Chips flat. Persons who saw the pieces of rich rock say it was immense in its richness. This ledge paid well some 15 years ago, when it was owned by Sterrett and others, and handsome dividends until a point was reached where it could not be worked economically without heavier machinery. The present company has expended a large amount of money in the development of this property, which we trust they will soon get back.

RUBY.—The spot of gravel found in the Ruby tunnel has not yet been proven to have belonged to any defined gravel channel. Workmen are pushing a drift east from near the top of the shaft where the gravel was found.

GOOD START.—The Bald Mountain Co. have made a good start towards getting rid of the dirt in their small dump, and still have a fair head of water. The late cold weather has checked the water in this section considerably.

DERBEC.—The Derbec mine, of which Roht. Denoon, brother of J. P. Donoon, is Supt., has discharged nearly all of its men, keeping only 4 or 5 on a shift. A large number were at Forest City this week looking for work.

STOPPER.—The pumps at the Pliocene shaft, used by the Bald Mountain Extension to furnish water for air and washing at the mine, have been stopped, there being sufficient water in the South Fork to answer all purposes.

GOOD YIELD.—The Bald Mountain Extension cleaned up their large dump last week, and realized 241 ounces, and the most of the dirt in the dump was waste. For two days' run last week 48 ounces was realized.

GOOD HOPE.—The Good Hope mill will probably be ready to run in about 10 days. A fair quantity of ore is on the dump, the hauling of which, about a quarter, is what is delaying the work.

BLUE GRAVEL.—The bedrock in the Blue Gravel tunnel has suddenly raised, and the tunnel is now all in rock. The owners consider this a good indication.

INCREASED.—The Bald Mountain Co. has increased its force, since it got water, by all the men in town who wanted work.

CONTRACT LET.—The Bald Mountain Co. have let a contract to run 500 ft of tunnel toward the extension to John Cashman, Mr. Johns and Wm. Culbert. The tunnel is to be 9 ft on the bottom.

CENTENNIAL DRIFT MINE.—Eight Forest City mining men, under the name of the Centennial Co., are engaged in developing a drift claim at Minnesota, two miles from Alleghany. They began work there in 1876, by running a tunnel through hard rock a distance of 800 ft, when they became satisfied that they were at too low a point on the ridge to tap the channel. Going some distance above that point they put a tunnel through 200 ft of barren gravel, and sank an incline to a depth of 100 ft, when they had to stop on account of being unable to handle the water. Another tunnel is now being driven 65 ft below the second one. It extends through bedrock for some 400 ft, about 60 ft being in gravel that prospects so well as to give the owners much encouragement. No work has been done since last July, but it is proposed to start the mine again without delay, that the rainy season has set in. During the 5 years they have been at work, the Centennial Co. have expended probably not less than $15,000.

TRINITY.

VERY DULL.—Trinity *Journal*, Dec. 17: While the late rains have not been sufficient to start hydraulic mines, they have succeeded in placing the roads in bad condition for traveling. But few outsiders now come to town, and as a consequence the town is dull.

TAYLOR FLAT.—It may be of some interest to your readers to learn that the country from Cox's bar to Burnt ranch is beginning to look up; the mines yielding more, and the people better content. We have had copious rains, the most of the water drank up by the thirsty soil, and the small streams have been but little affected; the larger have sufficient, especially French creek, and the Trinity hydraulic gold mine is now in full blast with all its appointments in so good order as money and labor can put them.—If you don't think so, enquire of your County Surveyor, whose judgment and knowledge will not be disputed—Mr. Lowden, an experienced miner who was down this way lately. Mr. Walker, superintendent, has put up a new flume and boxes, which gives him a 30-ft dump to run off top dirt, and it works admirably, and will be an immense benefit. The river continues low, but it will be some time before a flood is needed to carry away tailings. Pelletreau at Swedes bar is doing exceedingly well and is in fine glee. The gold taken out by him is very coarse and he has no trouble in finding dirt that pays from one to two dollars to the pan.

CONTRACT COMPLETED.—Jo. Falan has finished the 100 ft of the tunnel which he has been running under contract for the Bullychoop and Occidental Co. He tells us that he found some of the hardest rock yet encountered. One ledge known as the "little white lodo," was cut, but the main Bullychoop has not yet been reached. It is probable that the company will contract for a further extension of the tunnel in the spring. The white ledge is about 12 ft in width and carries some gold.

NEVADA.

WASHOE DISTRICT.

CON. VIRGINIA.—The work of cleaning out and repairing drifts and winzes on the 1600 and 1700 levels, for purposes of ventilation, is still going on.

UNION CON.—On the 2700 level are cutting out a drain and timbering up the joint Sierra Nevada connecting drift.

CALIFORNIA.—The work of clearing out and repairing the drifts and winzes on the 1000 and 1700 levels for ventilating purposes is still going on.

GERIR.—During the week 271 tons and 400 pounds of ore have been extracted from the croppings.

SIERRA NEVADA.—The joint Union Consolidated east winze has been sunk and timbered 5 ft and a tank pit is being cut out at the 2800 station.

UNION SHAFT.—Still repairing the drift leading out to the Sutro tunnel on the 1600 level; easing timbers at the 2000 level, and cutting out the bob pit at the 2600 station.

YELLOW JACKET.—The north lateral drift was run to a point 248 ft north of the north winze, at which point a switch was placed and a crossdrift started to the east, which is this day in 16 ft. Cut some seams of quartz in the north lateral drift, giving low assays. The machinery of the mine is all in good order, pumping the usual quantity of water.

SUTRO TUNNEL.—Report for the week ending Dec. 15: Main tunnel, sections 174 to 188—since last report the repairmen employed in the main tunnel near the Combination have placed in position 17 sets, 2 caps and 1 post of new timbers, and removed 8 sets and 9 posts of old timbers, and 4 drain boxes and 4 stringers. Also, some of the repairmen were employed a portion of the week easing timbers and bracing up and lagging the ground.

BRISTOL DISTRICT.

CLOSED DOWN.—The mill of the Bristol S. M. Co. has closed down for a few days, for the purpose of putting in a dry kiln. As soon as this work is completed the mill will resume crushing ore. Since the Day furnace closed down at Bristol a number of the Mormon teamsters have left for their homes in Utah and a few men have passed through here on their way to Bullionville. The Bristol S. M. Co. have purchased a dry kiln down at Bullionville from the Raymond & Ely Co. The Day Co. disbursed for last month's expenses $28,989.95. On Monday the wood and charcoal bills for November, amounting to nearly $8,000, will be paid.

CANDELARIA DISTRICT.

MOUNT DIABLO.—*True Fissure*, Dec 17: The winze from the bottom of winze No. 1 on the third level is down 12 ft and shows a 2½ ft ledge of ore which assays $45 per ton. The east drift from the bottom of winze No. 1 has been stopped. The intermediate, below the third level, shows some very fine ore, and the east drift on this level is giving some excellent ore from small bunches, the chances being favorable for its opening very well. There is no change in the west drift. The east drift on this level is being driven ahead to prospect the ground above the ore found in this part of the mine, on the level below, and is now cutting into some low-grade ore.

NORTHERN BELLE.—For want of air connection work has been stopped in the west drift on the fourth shaft level. There are being extracted and sent to the mills about 60 tons of ore daily. Bullion shipments for the week ending Dec. 14th, amount to $16,316 86. Shipments on December account to Dec. 14th, $28,419.67.

PRINCESS.—The work of excavating for the engine is finished and it will be wheeled into position and set in a few days. The timbers for the gallows frame arrived day before yesterday.

CRABB DISTRICT.

ATTRACTING ATTENTION.—Esmeralda *Herald*, Dec. 17: This district, which is attracting considerable attention at present, is situated on the old Wellington and Aurora toll-road, 9 miles east of what is known as the East Fork bridge, over Walker river, in a heavily timbered and well watered country. Some very rich gold and silver-bearing ore has been discovered, and almost every day new and promising locations are made. Already a number of houses have been put up to accommodate the workmen. An 8-mile haul, all down hill, will take the ore to the river, where grading for a mill has been commenced, just above the Rose stock ranch. A meeting is to be held there shortly for the purpose of forming a new district, making new laws and electing a new Recorder. Before a twelvemonth, we predict there will be no little excitement about this district, as they have the metal there with which to make a lively camp.

ESMERALDA DISTRICT.

OUR MINES.—Esmeralda *Herald*, Dec. 19: The progress made on the Cortez, Centennial, Eva Con., Thanksgiving and the various other mines that are being developed in our camp, is very encouraging, and the indications demonstrate the fact that Aurora must inevitably come to the front as a bullion-producing camp.

GARFIELD DISTRICT.

ORE FOR DAYTON.—Candelaria *True Fissure*, Dec. 17: Jos McClane—man from Garfield district—shipped 12 tons of ore from his mine in that coming camp to the Lyon mill at Dayton, last Wednesday. Mr. McClane went on the same train and will personally interview the railroad and mill authorities with a view to making regular shipments. The ore is thought to be a fair sample and the returns therefrom will be given as soon as the result is known. Mr. McClane will visit his daughter, Mrs. William Manning, in Virginia City, before he returns.

JACKRABBIT DISTRICT.

COTTON-TAIL.—Plochs *Record*, Dec. 12: This is one of the most promising claims in Jackrabbit district, and adjoins the Day claim. The late strikes of ore in the Day ha[illegible]s direct for the Cotton-tail ground. The men working on this claim at present are taking out some excellent ore. Next week the working force on this mine will be doubled, as it is the intention of the owner, J. C. Lynch, to sink a shaft and tap the ore down deep.

MAMMOTH DISTRICT.

WORK.—Cor. Grantsville *Bonanza*, Dec. 17: Mammoth mining district is not forgotten, nor has her glory as a meritorious mining camp gone, but the day is near at hand when she will proudly step to the front as a bullion producer. Work on the Esta Buena is progressing nicely. The Esta Buena Co. have quite recently bonded the Silver Wave mine for $15,000, paying 5% cash. Esta Buena—depth of main shaft 305 ft, at this depth have run levels during the last 7 months 1,200 ft for prospecting purposes. Have drifted on ledge 300 ft, the average width being 2 ft. In face of drift at this time the ledge is 4 ft in width; average assays of ledge $278; character of ore antimonial silver. Silver Wave—depth of main shaft 80 ft; average width of ledge 2 ft; average assays and character of ore about the same as in Esta Buena, and it is without doubt the same ledge. The Esta Buena Co. have recently purchased from the Rock Island M. and M. Co. their 10-stamp mill, assay office, boarding house and other buildings situated in this place.

PUEBLA DISTRICT.

THE PUEBLA COPPER MINE.—*Silver State*, Dec. 20: J. C. Wear is in from his copper mine in Puebla district. He says it is looking splendidly. There are large bodies of ore in sight in the mine, and four men are working steadily opening up the property and extracting ore.

SANTA FE DISTRICT.

A BIG SULPHUR MINE.—Candelaria *True Fissure*, Dec. 17: B. G. Smith brought into town yesterday some very fine specimens of native sulphur from his mine in Santa Fe district. The sulphur is in a large vein from which blocks weighing 100 pounds and more can be broken. The walls are of gypsum and the amount of sulphur seems illimitable. In quality it analyzes 87% and appears like that fed to the rising generation mixed with molasses. There is enough of it in this one mine to prove Ingersoll's theory a fallacy, because one can set fire to it and have a little hell of his own in 10 seconds.

TYBO DISTRICT.

TYBO DEPOPULATED.—Reese River *Reveille*, Dec. 12: We understand that mining operations in Tybo have been entirely suspended, and the people scattered to other sections. There is said to be but 8 persons left in the town, the Postmaster one of the number. That whole section of country is pretty much abandoned, excepting now and then a stockherder or rancher. Daily mail service continues through there between Eureka and Belmont, being performed with a one-horse buckboard. There is said to be a distance of 90 miles along the route where there is neither food nor fire to warm by to be had. At one time Tybo was a town of considerable size, and the Two G. mines producing ore of a paying quality; but like many other mining districts, it had its day, and from a combination of causes, gave up the ghost and passed in its checks.

ARIZONA.

MINES BONDED.—*Journal*, Dec. 17: The Southern Pacific and Oakland mines in Tyndal district, Santa Rita mountains, have been bonded to Eastern capitalists for $30,000, to be paid in 60 days. The owners of the mines are Mark Ezekiels, Mark Lully, Mose Lully and Chas. Altschul. The experts who came here from New York to examine the mines, have returned home well satisfied, and think they have a bonanza.

TYNDAL DISTRICT.—*Citizen*, Dec. 13: F. F. Cranz is in town from Tyndal mining district, Santa Rita mountains. He reports an amount of activity and interest in that camp heretofore unknown, and thinks that the slowness that has previously characterized it has disappeared forever. The new road from Tubac to Solari is being rapidly pushed, and great progress has already been made. Under the energetic superintendence of the overseer, Mark Lully, the road will soon be completed, and no doubt will be equal to any in the country. The companies for which Mr. A. R. Cecy is superintendent, are grading for their 30-ton water jacket furnace, and they propose carrying the work on to completion with undiminished energy. Prof. Dana Harmon, Mr. P. McArthur and D. W. Neil are doing considerable in the way of development on their properties. They are also grading a roadway to their mill site, where they propose, at an early day, to erect a stamp mill, which the present appearance of their mines unquestionably warrants. The number of stamps has not yet been decided upon. The camp is having a boom which it is to be hoped will continue, and it will no doubt become, ere long, another one of the bullion producing districts of our country.

SOLOR DISTRICT.—*Silver Belt*, Dec. 18: The cause of the stoppage at the Globe City mill is the absence of necessary material. Mr. Monroe is making ready for the erection of the Centennial Co's. mill. He will utilize the cut stone work already in place. The foundation for the engine bed will be commenced at once. There will be some unavoidable delay in the procuring of lumber, but not of long duration. We were shown some fine crystals, taken by Mr. Deveraux, from a copper mine at Dripping Springs, which he called "yellow garnets." There is a large quantity of the formation in the mine, and it carries lime and iron; it furnishes a flux for the ores.

IDAHO.

COMING IN.—Challis *Messenger*, Dec. 10: Miners generally are coming from their summer fields, and either going out to see the Utah, San Francisco or States fashions, or going into winter quarters here. And never before did they rest so easily—the mines are looking so well.

STANLEY BASIN.—Yankee Park *Herald*, Dec. 12: This is generally supposed to be a played-out placer mining camp by outsiders, but it is not. There would be hundreds of men at work in the placers to-day if the water supply was sufficient on ground that would pay from $10 to $15 per day to the hand. A ditch of only 8 or 9 miles in length would have to be run to take in an abundant supply, and we cannot see why it is that the miners there do not club together and bring in one. It would be through easy ground, and, by doing the work themselves, the expense would not be great. Besides the placer there are a great many quartz ledges carrying gold and silver, but no attention has been paid to them, except by Mr. Ell Chase, who located two or three of them during the summer, and had some of the ore from one of them assayed, which showed $1,000 to the ton in gold. We visited that section three months ago, and were very favorably impressed with the appearance of the country, and with the formations. That there are a large number of good gold mines is evident from the amount of float found all over the hills, and the time will come when Stanley basin will be numbered among the best mining districts of the Territory.

MONTANA.

ANOTHER RIVER-BED FULL OF NUGGETS.—Helena *Independent*: It appears that the Gravely range gives promise of turning out something that bids fair to rival Col. Keeler's famous ancient river bed bonanza below Helena. It is claimed there is a channel of an ancient river on the summit of the Belt range, and that from this came the fabulous wealth of Confederate gulch, Montana bar, Montana and Cement gulches. Although no pay streak has yet been developed on this range, much prospecting has been done and some gold found. A number of shafts have been sunk, some of which have prospected well, but as in the case of Col. Keeler's prospect shafts, the water was too plenty to allow of thorough development. A tunnel was run into the side of the rangs to afford drainage, but after getting in 500 ft and before reaching the channel, the men engaged on it had to stop for want of means to go farther. This was done several years ago, since which time it has lain idle. Preparations are now being made to develop the channel, and if there is any treasure hidden there to bring it to light.

NEW MEXICO.

PINOS ALTOS.—*News and Press*, Dec. 17: Reduction works are talked of in the Pinos Altos district, Grant county. The ores are rich and abundant.

BESSIE.—Work on the Bessie mine in Mora county has been resumed. The ore shows indications of silver, with plenty of copper. A whim has just been erected.

SMELTER.—Two Colorado men are to put up a 1-ton smelter in Water Canyon district near Socorro, to test the ores to see if it is of sufficient high-grade to warrant the erection of a smelter.

MILL.—The mill at the Santa Rita Co's. mines in Grant county, will start up about the first of February. The machinery is still being received, and by the time the structure is completed will be all on the ground ready for erection. The ore on the dump is now awaiting treatment is full of native copper, and a mill test will show a very high per cent of that metal.

SOCORRO is fast becoming the mining center of New Mexico. Sales of mining properties in the neighborhood of town are continually being reported. A custom stamp mill and smelter is in full operation, and side tracks are now being built to the works, and a big scale put in. The mill of the Torrence mine started up this week, with an abundance of good ore on the dump, and a large force is taking out rich ore. It is reported that another 20-stamp mill will be erected on the Merritt mine, and the Socorro Tunnel Co. will erect one on their properties.

WHITE OAKS.—Development is steadily going forward in the White Oaks mines. Machinery for the Homestake stamp mill is now on the ground and being placed in position. Mr. Hodgmann, who has charge of the work, claims to have made several valuable inventions while he has been in the Oaks, which will reduce the cost of, and loss in amalgamating. Practical men vote it a success. The Little Nell has a tunnel 200 ft long. The outlook is good. The Little Mac is the bonanza of the camp. Work is now in 200 ft, with free gold showing in all the veins. It is estimated that there are over 50,000 tons of ore in sight, which at the mill run test would give over a million dollars profit.

NATIVE SILVER.—Another rich strike of native silver has been made near Silver City. The discovery was made by J. H. Carroll, near Price's ranch on the west side of the Gila river in Grant county, and Carroll, W. F. Clarke and James Corbin are the owners of the mine. A shaft sunk to the depth of a few feet disclosed a three-foot vein, supposed to be a true fissure. The mine produces a dark, red quartz, in which native silver is found in nuggets or balls, varying in size from minute particles to that of a walnut. When the ore is broken, these round nuggets become detached from the rock and fall out like bullets. The ore tested will go fully $8,000 to the ton. Several other discoveries nearly or quite as rich have been made in that neighborhood, native silver as pure as if from a furnace being produced.

OREGON.

MYRICK'S MILL.—*Bedrock Democrat*, Dec. 14: Capt Myrick's quartz mill is crushing steadily on a large quantity of high-grade ore, and we expect soon to hear of a big clean-up from that quarter.

UTAH.

CARBONATE.—Southern Utah *Times*, Dec. 20: But little work is now being done on the Carbonate mine. The Carbonate Concentrator shut down temporarily on Tuesday.

CHARLOTTE.—*Southern Utah Times*, Dec. 17: The Charlotte mining claim, located about one mile northwest from Frisco, at a depth of 22 ft contains a vein of ore 15 inches wide, which very much resembles Horn Silver ore. This claim is worth prospecting.

LULU.—In company with Supt. Ryan, we visited the Lulu mine on Thursday. This mine is situated immediately south of, and adjoining the Horn Silver. The Lulu is an incorporated property, and is owned by Messrs. Culleo and Ryan of Horn Silver fortune, and a number of capitalists in the city of Chicago. The mine is being developed by sinking a shaft about 100 ft east of the footwall. The shaft is now down about 200 ft. We understand it to be the intention of the company to keep on sinking until in their judgment the proper depth has been reached from which to drift toward the hanging wall. The character of the formation, the footwall of which is the same as that of the Horn Silver, and has the same dip, all point to the fact that deep down there lies buried a large body of rich ore. The striking of a rich body of ore in the Lulu will mark a bright epoch for the people of Frisco.

SILVER REEF.—*Miner*, Dec. 16: Having now entered upon the last month of the closing year, the time will soon be at hand when the balance sheet and annual exhibit will be forthcoming, to show the accumulated product of the precious metals from this district. For 5 years a steady stream of bullion has poured into the marts of commerce, and helped to swell the nation's wealth. Although unforeseen causes interrupted in part the operations at the mines for a considerable portion of the year, the showing will nevertheless, we predict, be of the most satisfactory character to all concerned. As this writing the mills and mines are all running to their full capacity and demand, and the prospects are most flattering for the future.

GOLD BASIN.—From Gold Basin, which is now looming into prominence, we receive the most encouraging reports. The first 24 hours' run of the mill of that district—succeeding the clean-up reported previously—15 tons of free milling gold ore was treated, yielding $48 to the ton. There is an abundance of this ore upon the mill dump at present, as well as several hundred tons of much higher grade awaiting treatment.

MINERAL PARK.—The Lone Star, Keystone and several other of the mines of this district are producing good milling ore, which is being worked at the Lone Star mill. The outlook is very encouraging for a new lease of prosperity for this long-neglected camp.

CREAT.—The mill repairs have just been completed and the company have resumed operations. The mines of the vicinity at no time looked more promising or yielded better than at present.

GRAND GULCH.—Late advices from this district leave no doubt but that the problem of reducing the rebellious copper ores has been satisfactorily overcome. The two smelters at the mines are being run to their full capacity, and more are in course of erection. The Messrs. Adams are to be congratulated on their persistence and success

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SETTLERS are coming in numerously along the line of the California Southern railroad, in San Diego county, and are taking up every available piece of land that can be obtained,

The Yield of Wood River Mines Last Season.

For weeks past the *Times* has endeavored to procure accurate reports of the ore and bullion shipments from the Wood River country during the past season, but its efforts have been met with only partial success. Enough has been ascertained, however, to warrant the statement that during the seven months ending on the 1st inst., over $1,000,000 worth of bullion and ore was shipped out of the Wood River country. The exact figures will be published when received. At present only approximate amounts can be stated.

Shipments from Bullion.

The bulk of the ore from this camp was probably shipped to Hailey, thence transhipped for Blackfoot or Kelton, where it was loaded on cars and taken to Salt Lake. The report includes all shipments during the season beginning May 9th and ending Nov. 30th.

The Mayflower shipped 970 tons carrying 175 ozs. silver and 70% lead per ton.

The Bullion shipped 415 tons carrying 225 ozs. silver and 50% lead per ton.

The Jay Gould shipped 375 tons carrying 120 ozs. and 65%.

The Eureka shipped 74 tons, carrying 100 ozs. and 65%, lead per ton.

The Homesteke shipped 12 tons, carrying 140 ozs. and 55%.

The O. K. shipped 2¼ tone, carrying 175 ozs. and 70% lead.

The Champion.

The Idahoan, according to the reports furnished, is entitled to the first place in the list of local ore-producers. During the past season it shipped 1,000 tons of ore averaging 150 ozs. silver and 75 to 81% lead. There remain on the dump 800 tons of ore half of which assaye from $130.58 to $3,100, besides carrying from 50 to 70% of lead; the other half will yield, clear of all expenses, $53.60. The yield of the Idahoan the past season has exceeded $200,000.

From Hailey.

The Star mine shipped ore that eold for $37,500.

The Ophir, Emma Fair, Japan, Bon Ton, Washington, Narrow Gauge, French, and other groups and mines also shipped ore, hut the figures are not known.

The local smelter shipped abont $75,000 worth of hullion.

From Ketchum.

The Philadelphia company shipped $32,000 wortb of hnllion, the result of a hricf trial run.

The Carrie Leonard shipped 38 tons, averaging 200 ozs. in silver.

The Rooks, Black Horse and Allen shipped 30 tone each, which averaged 144, 144 and 130 ozs., respectively.

The Connors shipped 25 tons, carrying 120 ozs.

The Elkhorn shipped 600 tons, which averaged 120 ozs. silver.

From the Vieuna and Mountain King mines, ahout 30 tons of fair milling ore were shipped to Ketchum, thence to Salt Leke. They yielded 271 ozs. per ton.

Mr. Smiley also shipped some ore to Salt Lake, hut the figures have not heen obtained.

The total shipment from Ketchnm will probably aggregate 500 tons, carrying an average of 130 ozs. silver.

Shipmente from Bellevue.

From Bellevue reports of the shipment of 281 tons have heen received. These are as follows:

Minnie Moore mine, 217 tons, averaging 101.62 ozs. silver and 67% lead.

Monday, 5 tons, averaging 622.70 ozs. silver and 54% lead.

Overland, 14 tons, avereging 99.16 ozs. silver and 70% lead.

Queen Victoria, 34 tons, averaging 137.43 ozs. silver and 64% lead.

Mammoth, 5 tons, averaging 92 ozs. silver and 67% lead.

Morton, 6 tons, averaging 152 ozs. silver and 68% lead.

Besides the ahove mentioned, the Queen of the Hills and five other mines shipped ore, but no reports have heen received hy the *Times*.

A Curious Case.—The Virginia *Enterprise* records the following extraordinary case: It now appears prohahle that James Rowe, who was so fearfully injured hy the explosion in the Forman shaft, will get well. Both of his arms have heen amputated and the sight of hoth eyes appears to he gone. His hody was perforated in hundreds of places hy small pieces of rock, yet with all this the man is steadily improving. The fragments of rock hlown into the man's hody have not heen dug out with instrnments, hnt have heen left to work out of themselves, and daily pieces of gravel are coming to the surface in one place or another. Mr. Rowe doee not yet know that hoth hands are gone. He etill thinke he has one arm left. Yesterday, Dr. Wehher, County Phyeician, asked him if he would not like to change his position and rest on his eide for a time. He said he would like it very much; "hut," eaid bo, "you know, Doctor, that I must he very careful of the arm and hand left me. I am afraid that shonld I change my position, it would hring a etrain on that arm before it is sufficiently strong to bear it." The Doctor had not the heart to tell the man that he was armless, and only eaid: "Very well, Jemmy, make yonrself ae comfortahle ae you can, and whenever you feel like heiug turned let me know."

Iron Ore in Shasta and Other Counties.

Of all the nndeveloped resources of this State none have heen eo entirely overlooked and neglected as the iron interests. It was not until recently that the least attention was paid to the subject, and even now, ontside of a few local pepers and one or two of the San Francisco dailies, the matter is not mentioned. Puhlic attention, even in the conntiee where valuahle deposits of iron are known to exist, have not attracted that investment of cepital necessary to the development of the mines. Notwithstanding this indifference regarding what is sure to he one of the leading interests of the State in the near future, at least five of the mountain counties contain deposite of iron equal in quality to the richest ores of Pennsylvania and New York—Calaveras, Tuolumne, Placer and Shasta. In relation to the supply we cannot speak with any certainty as to other counties, hut in Shasta all the indications lead to the helief that it is inexhaustible. Shasta, alone of the counties known to contain iron, produces the hlack oxide, or what is more popularly known as magnetic ore; deposits in the others consiet wholly of the hydrated oxide of iron, a qnality of ore nsually oalled' hrown hematite. The difference hetween the oree is that the magnetic is richer, and is usually made directly into wronght iron in forges, while the hematite is mannfactured into pig.

The immense iron heds owned hy J. B. Potter, Avery, Gov. Stanford, and others, eituated near the McClond river, at the site of the old Silverthorn hridge, and secnred hy government title, are extensive enongh to justify the employment of heavy capital in working them. Iron monntain ie known to contain conntless millions of tons of the finest quality of iron ore, and our local hlacksmiths have repeatedly heated epecimens of it in their forges and hammered it into varions implements. With an ahundance of snch ore and a plentifnl supply of wood for coaling purposes, and excellent sites for furnaces ohtainahle, what better facilities for the profitahle manufacture of iron on a large scale can he asked for? As the deposits specially mentioned will be quite near the line of the railroad, we may reasonahly expect that they will not he allowed to remain idle very much longer.—*Shasta Courier.*

The Hydraulic Pumps on the Comstock.

The work of laying the 12-inch supply pipe from the big reservoir on the side of Mount Davidson to the hydranlic pump of the Chollar-Norcross Savage shaft bas been commenced. The pipe will he in place by the 1st of next month. The hig pump will then he rnn hy the natural pressnre of water flowing through the supply pipe. There will then he no nse for the surface engine, by means of which a powerful pressure is brought to hear npon the vertical column of water in the present supply pipe, and whioh not only operates the pumping apparatus down at the 2400 level, but also hringa to the surface (through an exhaust pipe) a stream of water enfficient to feed the snpply pipe.

The present hight of the supply pipe from the pumping apparatus to the surface is 2,400. When the pipe now heing laid from the reservoir ie connected with this it will give an additional pressure of 440 ft.; that is, the pressure in tbe snpply pipe will then he equal to that of a column of water of the vertical hight of 2,840 ft. In no place in the world ie a hydraulic pump running nnder the pressure of a column of water of such great hight.

When the pnmps are run hy means of a natnral flow and pressure of water it will no longer he necessary to hring any water to the surface. What is now the exhaust pipe will thsn be cut off at the Sntro tunnel level and two pipes will then he constantly discharging at that point. When they begin working hy the new plan they will have the water entering the pumping apparatns through a pipe 2,840 ft. in hight and discharging through one hnt 800 ft. in hight; therefore there will be gained the moving force of a column of water 2,040 ft. in hight.

Rich Strikes in Arizona.—Two very rich strikes were made at Mineral Hill yesterday, one in the Wedge mine of the Chollar group, helonging to Miller & Sihhad, and the other on the Specie-Paying, the property of the Indiana company. In the Wedge mine the strike consists of a 5-ft. streak of very rich horn silver-bearing rock. In the Specie-Paying the etrike was mede in an open cut on the north end of the claim, ahout 200 ft. from the south end of the Alice mine. The ledge, which was 30 ft. wide at this point, was cnt into 4 ft., and showed masses of horn silver the entire distance. The ore will mill $80 per ton, and will work up to 90% hy the ordinary milling process. These strikes are cansing mnch excitement here.

The Gold Hill mining company at Grase Valley has applied for a patent to its ground. Thie wae the first ground located for quartz mining in that district, in the year 1850, and in all prohahility the firet claim located for that purpose in the State, ae Gold Hill was the scene of the firet qnartz operatione in California.

Tombstone ie now experiencing more prosperone timee than it has ever known hefore. One cause ie that the people have at last come to the conclusion that the lawe mnst he oheyed, and that life and property mnst he protected. All who think differently will have to etand from nnder.

Mining Frauds.

There must he a very disgraceful eystem of "chenanigan" heing practiced in the stock hoards of New York in the branches specially connected with mining operations. At least, it would seem so from the tone of the mining press of that city. The *American Exchange* says, without attempting at the moment to pick ont isolated cases, or to fix the responeihility for the series of lossee which for the last year have fallen npon the people of the East, who were crednlous enough to credit the professione of those Western persons who wanted to make mining as stahle and as legitimate an interest as agriculture, we do say that the term "disgracefnl" is not too severe a term to apply to the many maltreatments and mismanagements of mining propertiee which have become a reproach to everyone who has had the success of the mining indnstry at heart.

There must he some change in tbe way of managing mining companies; there mnst he provided hetter safegnards for the protection of investors; there must he devised some system by which officere and directore of mining companies will not eo readily he made the tools hy which scamps can so outrageously hoodwink and roh the public.

Something shonld he done in this direction, and that speedily. A fraud is a fraud whether perpetrated in a commercial, agricultnral or mining transaction. Who will swindle in the one ie restrained hy no conscientious scrnples to *rob* in the other, or, if need he, upon the highway.

The man or men who will fraudulently mierepresent the outlook or prospective productiveness of mines is no hetter than one who will put his hand in your pocket and filch therefrom whatever little coin may he found floating in its cepacious reoesses. What is called in mining parlance, manipulation, in common and recognized English, means thieving. To declare dividende when no such results follow in fact is only to ohtain "money under false pretensee." If nnder certain circnmstancss this kind of "manipulation" sends the manipulator to the Stete or Territorial penitentiary we fail to see why, perpetrated under similar conditions but in the prosecution of another character of villeny the same penalty ehonld not attach. The trnstees or directore of a mine or mining corporation who declare a dividend of one per cent upon a capitel stock of $10,000,000 with no deposit of ore taken from the mine, and npon this representation puts the stock upon the market and imposes it upon the puhlic as dividend-paying, are not a whit less rescals and rohhers than the masked villiane who demand your purse or your life on the highway. They should he punished accordingly. Misrepresentation of a mine is no lese nefarious than tbat of a house or a horse and whoever ohtains money or other valuahles hy fraudulsnt misrepresentations in one case is no less a thief than he who ohtains it in the other.—*Arizona Journal.*

A New Variety of Glass—A Vienna chemist has recently discovered a new variety of glass. It does not contain any eilica, horic acid, potash, soda, lime, or lead, and ie likely to attract the attention of all professional persons on account of its peculiar composition. Externally it ie exactly similar to glass, hut its luster ie higher and it has a greater refraction, of equal hardness, perfectly white, clear, transparent, can he grounnd nnd polished, completely insoluhle in water, neutral, and it is only attacked hy hydrochloric or nitric acid, and is not affected hy hydrofinoric acid. It ie easily fnsihle in the flame of a candle, and can he made of any color. Its most important property is that it can he readily fnsed on to zinc, hrass and iron. It can also he nsed for the glazing of articles of glass and porcelain. As hydrofinoric acid has no effect on the new glass it is likely to find employment for many technical purposes.—*Wiener Gewerbe Zeitung.*

Slip in Belts.—From experiments made it has heen ascertained that ahout two revolutions per hundred are lost in the transmission of motion hy a helt. In ordinary practice this would he a elight loss, and would in no wise interfere with the nsnal manufacturing processes; hnt, where there ie a long train of gear repeated from shaft to shaft hy helts, the loss hecomes serious. It ie clear that if the coefficient of loss hy slippage he .98 for a single pair, which has heen verified with great certainty hy varying the tensions of the same helt, it will become equal to the euccessive powers: 98, 96, 94, 92, 90, and so on; so that after a succession of five speeds, the loss amonnts to one-tenth of the calculated epeed, and at the end of 34 epeeds the velocity will he redneed to half. From these considerations it appeare that where it is required to transmit epeeds as near determinats as may he, hy means of hands and pulleys, it is necessary to increaee the diameter of the driving pulley hy its fiftieth part, or diminish the driving pulley in the eame ratio.

John Catalow, who is largely intereeted in the South Mountain mines, eays the Winnemucca *Silver State*, informe ne that the furnacee are running eteadily and tnrning ont ahont eix tone of hnllion daily. Last Satnrday 600 hars, averaging ahont 100 lbs. each, had heen smelted, and a part of it shipped to thie place. The hars contain from $25 to $30 each in eilver, or from $500 to $600 per ton. No tronhle whatever was experienced hy the Eureka men, who have charge of the furnace, in emelting the ore.

The Mode of Working the Morey Ores.

The following is an extract from a letter received hy Dr. J. A. Stites, of Belmont, written at Morey, Nye county, Nevada: "In your last you expressed a wish to know something of our mode of working the Morey ores. While I have neither time nor space to go into details, I will hriefly state the most important points: The ores of this district are moetly a heavy antimonial sulphide, in some cases carrying as high as 50% antimony, while the average is ahout 20%. This ore we treat in the following manner: It is first screened eo ae to separate the dust and fine perticles. The coareer part ie then put up and hurned in pits, eimilar to charcoal pits. It takee from six to eight weeks to hurn one of those pits, and so heavily is the ore charged with enlphur that three cords of wood will thoroughly ignite 60 to 70 tons. This ore when burned is ready for the mill, and, with careful handling, I have worked it up to 90% on an average. The screenings, or fine particles, cannot he treated in this, as they are too fine to hnrn, hut hy passing them through the furnace as they come from the mine we manage to get rid of the sulphnr; it is then pessed through the hattery and treated in the usual way. The furnace is one of the original White's and is now well adapted for handling this kind of ores, hut I have improved and changed it so that it does its work well, and I am satisfied that no other mill in the State can ehow ae good resnlts on a similar character of ore. Parties here are satisfied that the problem has heen solved, and the future of Morey never did look so hright as now. The company are indehted to A. McArthur, hy whose energy and skill as foreman their mines have heen placed on a paying hasis."

An Expanding Mandrel.—An expanding mandrel recently introdnced consists of two parts, viz.: a rihhed split sleeve and the mandrel proper. The sleeve, which is made of steel, is pierced with a tapering hole, and one end of the mandrel is turned to exactly fit this hole. The sleeve is then turned to the required diameter, preferably on the mandrel to which it helongs, after which the material is removed in such a way as to leave three narrow longitudinal hearings with equal depressed epaces hetween them. These depressions extend very nearly to the hore of the eleeve, leaving only sufficient metal to hold the hearings in position. The sleeve is cut apart through one of these depressions, leaving it free to contract or expand. In using this mandrel, the eleeve is placed in the hole, where, hy lightly driving the mandrel into it, expansion will occur, and the three bearing surfacss will he forced into eufficient oontact. The contrivance is simple in construction, can he readily and inexpensively made as required for nse in a machine shop, end can also he advantageonsly manufactured and sold as a standard tool.

We learn that Col. T. G. Bilty and John Mnhlhach, of Greenwood, have just hrought ahout the sele of three quartz claims at Fraser Flat to an Eestern company, the price heing $50,000. Five tons of the quartz are being tested this week at the Cal. W. & M. Co.'e mill, and parties who hnve prospected the rock inform ns that it is quite rich. A 20-stamp mill ie to he erected upon the new consolidated mine right away. We also learn that the same parties have negotiatcd for the sale of the Wildwood mine, ahont two miles east of Georgetown, to the same company, for $6,000. Mr. Bilty has large experience as a mining expert, and appears to possess considerahle influence with capitalists seeking investment in good mines.—*Georgetown Gazette.*

Found it out by Experience.—One of the etrongest arguments that can he presented against the cheapnese of Chinese lahor, ie the experience of the Bald Mountain drift mining compeny, who several yeare ago made some experiments in this direction. They kept careful record of the results of employing the Mongolians, and in a short time hecame thoroughly satisfied that Chinese miners were expensive institntions to have around. Since that time the nnwritten motto of the company has heen, "No Chinese Need Apply."—*Sierra County Tribune.*

Niter Company.—Governor Kinkead, James Crawford, T. R. Hofer, G. G. Lyon, S. H. Day, A. Hehherling, J. M. Hetrich, and others, have taken up 3,000 acres of niter land in thie State, and have interested eome New York capitalists in the prospecting of that property. It is nnderstood that refining works will he erected on the land at an early day. Governor Kinkead is President, and T. R. Hofer ie Secretary and Treasurer of the company.—*Eureka Sentinel.*

The Otto Gas Engines at Paris.—In the distrihntion of awards at the exhihition of electricity, in Paris, the Otto motor received a gold medal, the highest award given to machines of this clase. As an indication of the succese of these motore, it is said that over 7,000 of them have been put in operation during the past four years.

Many men hnrned in the minee hy the explosion of gae owe their deathe to the fact that they have pereisted in working without any ehirte or other protection for their hodiee eave pantaloone.

Thirty-nine loads of ore, eetimated to he worth $200 a load, from the Ford & Mnllen mine at Grase Valley, are heing milled. Eleven men and hoye extracted it in two monthe.

The Engineer.

A Canal Boat Propelled by Air.—A novelty in canal boats has recently heen constructed at Wiscasset, Me., after designs devised by the owner, Mr. R. H. Tucker of Boston, who claims to hold patents for the design in both the United States and England. The first boat built is now lying at the month of Charles river, Boston, where it has been examined with much interest by engineers and others. This boat is designed to be used on canals without injuring the banks; it is a simple structure, measuring 62 ft. long and 20 ft. wide. It is 3 ft. in depth and draws 17 inches of water. It is driven entirely by air, a Roots blower No. 4 being used, the latter operated by an 8-horse-power engine. The air is forced down a central shaft to the bottom, where it is deflected, and, being confined between keels, passes backward and upward, escaping at the stern through an orifice 19 ft. wide, so as to form a sort of air wedge between the boat and the surface of the water. The force with which the air strikes the water is what propels it. The boat has a speed of four miles an hour, but requires a 35 horse-power engine to develop its full capabilities. The patentee claims a great advantage in doing away with the heavy machinery of screws and side wheels, and believes that the contrivance gives full results in proportion to the power employed. It is also contrived for backing and steering by air propulsion.—*Boston Journal.*

Society of Mechanical Engineers.—The last annual meeting of the American Society of Mechanical Engineers was well attended, and the papers presented, though not large in number, were of considerable interest and importance. The *American Manufacturer* indulges in the following criticism upon them: "If the papers read were shorter and more to the point than most of them were they would be more widely published, more universally read and more easily understood. Hence, they would accomplish more good then such papers now accomplish, and their authors would reap just as much glory, if not a little more, although many of them appear to think differently, judging from the length of their papers. They do not appear to realize that life is short, that most men at this age of the world have at best more to do than they can get through with comfortably, and that what may afford gratification to themselves may, on account of its verbosity, be a bore to others." It may be remarked that the discussions upon the papers were necessarily somewhat limited on account of the short time which the Society had at its disposal. The press of business felt by most mechanical establishments at the East at the present time no doubt kept many away and deterred others from the preparation of valuable papers. The next session will be held at Philadelphia.

Experimental Shipbuilding.—M. Raoul Pictet lately read a paper before the Paris Academy of Sciences upon the scientific principles by which the speed of vessels might be considerably increased. M. Pictet, having studied the question of producing a vessel to transport a given weight with the greatest economy and speed, has arrived at the idea of constructing one that shall be comparatively broad and shallow. The bottom will receive a constant upward pressure, which M. Pictet believes will tend to decrease the draft in proportion as the speed increases. His calculations show that with a vessel constructed on this principle a speed of from 35 to 40 miles an hour should be attained. A experimental boat has been ordered from a firm in Geneva, and is expected to be tested on March 1st of next year. *La Nature* considers that M. Pictet's former work is a guarantee that this time, too, his experiments will prove of practical value. It is to be borne in mind, however, that this is a very old idea, and unless M. Pictet's plans include special features, which are as yet unknown to us, we fear that his experiments will only result in disappointment.

Naval and Submarine Engineering Exhibition.—An international exhibition of naval and submarine engineering appliances is announced to be held in London, in April, 1882. It is intended to cover the wide field occupied in the production of machinery and mechanical contrivances employed in shipping, harbors, etc. Prizes are to be given for the best means of saving life in case of shipwreck, and for the best invention of a humane character connected with sea-faring matters.

Tunnel Under the Severn.—It is announced that, after some seven years' labor, the tunnel under the Severn has at last practically been made. The workmen are said to have met in the middle of the channel, and joined the two paths of communication from the English and Welch sides; so that, unless some most unlikely interruption or disaster should now occur, there remains nothing but to enlarge the passage, wall it in and lay the lines of rail.

New Bridge over the St. Lawrence.—Surveys and soundings for a new railway bridge over the St. Lawrence river, west of the Victoria bridge, are being pushed forward rapidly. The engineer-in-chief hopes to make his report as to the site in a few days to the directors of the Atlantic and Northwest railway.

Useful Information.

The Difference Between a Cyclone and a Tornado.

The difference between a cyclone and a tornado is defined by Mr. William Ferrie, of the United States Coast Survey, to be this: A cyclone is usually a broad, flat, gyrating disc of atmosphere, very much greater in width than altitude; a tornado is a column of gyrating air, the altitude of which is several times greater than its diameter. Cyclones are born of conditions extending over large areas; tornadoes depend rather upon the vertical relations of the atmosphere, and occur when, owing to local changes of temperature, the under strata of air burst up through the overlaying strata. The enormous velocities of the ascending currents of tornadoes are supposed to be caused by the difference between the gyrating velocities above and those on the surface. It is these ascending currents which carry up the vast bodies of water afterward precipitated in the form of a deluge of rain. The water is sometimes kept from falling by the ascending currents, and is often projected outside the area of the tornado, when it falls in a gentle shower over a larger area. When the weight of the water overbears the force of the ascending currents, there occurs the tremendous fall of rain known as a cloud-burst. When the area of a tornado is very small, a land-spout or a water-spout may be formed, according as it is over land or water. The width of these spouts ranges between 2 ft. and 200, and their hight from 30 to 1,500 ft. A white squall is an invisible spout, formed when the dew point is low. The accompanying cloud is invisible because of its hight, but below there is a raging and boiling sea, with a gyrating current of air above it. Land-spouts and water-spouts are hollow.

Effect of Sunshine.—From an acorn, weighing a few grains, a tree will grow for 100 years or more, not only throwing off many pounds of leavee every year, but itself weighing several tons. If an orange twig is put in a large box of earth, and that earth is weighed when the twig becomes a tree, bearing luscious fruit, there will be very nearly the same amount of earth. From careful experiments made by different scientific men, it is an ascertained fact that a very large part of the growth of a tree is derived from the sun, from the air, and from the water, and a very little from the earth; and notably all vegetation becomes sickly unless it is freely exposed to sunshine. Wood and coal are but condensed sunshine, which contains, three important elements equally essential to both vegetation and animal life—magnesia, lime, and iron. It is the iron in the blood which gives it its sparkling red color and its strength. It is the lime in the bones which gives them the durability necessary to bodily vigor, while the magnesia is important to all of the tissues. Thus it is, that the more persons are out of doors, the more healthy and vigorous they are, and the longer they will live. Every human being ought to have an hour or two of sunshine at noon in winter, and in the early forenoon in summer.

A New Patent Boot Heel Protector.—Mr. M. D. Williams, Syracuse, N. Y., has invented a new patent metallic boot-heel protector. This protector is made of brass or light steel and is fastened around the outer edge of the heel with three screws. It is about one-half an inch in hight, and protects the bottom of the heel by a narrow flange, which operates to keep the heel from wearing away at the edges, and at the same time gives strength and stability to it. The protector being very light adds but little to the weight of the boot, and, what is usual in like inventions, it does not detract from the finish or good appearance of the boot. This improvement is comparatively inexpensive, and the manufacturer who may be fortunate enough to obtain control of the patent ought to realize a handsome fortune out of it.

Carbonized Bran for Fruit Packing.—The California Fruit Shipping Co., of Vacaville, in this State, furnishes the following information in reply to a query from an Eastern paper: "Carbonized Bran" is made from ordinary wheat bran burned in a retort, under which treatment all moisture is driven off and a species of charcoal is obtained. This coal bran is used in packing green fruits for long shipment, and the patentees claim that grapes, when thus packed, may be shipped from this coast to Eastern markets by slow freight with safety, thus avoiding the high charges on fast freight. The company claims that tomatoes have been kept for six weeks when packed in this bran. It is stated that peaches will keep twice as long as under ordinary conditions, but this fruit having a porous skin is not as well preserved as other fruits.

To Bend a Wrought Iron Pipe.—Fill it with melted resin. When the resin hardens bend the pipe, and it will retain its round form. Remove the resin by heating.

Immense Mirrors.—There have been set up in the Grand Opera House at Paris a number of mirrors, measuring 45x52 ft., and weighing from 1,200 to 1,600 lbs.

Fires from Steam-Heating Pipes.

Steam pipes cause fires in two ways: first, by assisting spontaneous combustion of oily fiber, and, secondly, by very slow carbonization of wood at a low temperature which will ignite at a slightly higher temperature. It is a well-known fact in chemistry that the temperature at which charcoal will take fire varies with the temperature at which it is made. The extremely low temperature at which some forms of carbon will ignite is shown by the familiar experiment of burning tinder in a close glass tube fitted with a piston; the heat developed by the condensed air, when the piston is forced down, being sufficient to ignite the tinder.

The writer has seen charcoal ignited by the heat of a horizontal flue which was cool enough to serve for a walk. Steam pipes must be kept clear of combustible material of all kinds and nature. In passing through hollow walls and floors, the pipe should be surrounded by a sleeve made of larger pipe—large enough to leave a free air space between the steam pipe and the outer pipe. Rats are prone to make their nests around steam pipes in such concealed spaces. The necessity for all excessive espionage can be saved, available area added to the mill, and all portions of the mill containing machinery can be more uniformly and economically warmed by elevating the steam pipes, running them around the rooms about two feet from the walls and ceiling, the lines of pipe lying side by side in a horizontal plane. The use of elevated steam heating pipes in rooms without operating machinery, has not been sufficiently general to warrant any decided opinion in the matter. Some rag rooms in paper mills and sorting rooms in woolen mills have been fitted with overhead steam pipes, and they have proved satisfactory. In one instance a rag room has been so heated for six years. In short, the practical results of elevating steam-heating pipes and moving them away from the walls have been of such a favorable nature that the writer never knew of such pipes being moved back to the usual position near the floor.—*Iron.*

Bronzing Copper.—At the Paris mint medals are bronzed by boiling them for a quarter of an hour in the following solution: pulverized verdigris, 500 grammes; pulverized sal-ammoniac, 475 grammes; strong vinegar, 160 grammes; water, two liters. An untinned copper boiler is used, and the medals are separated from each other by bits of glass or wood.

Stove Blacking.—The most lasting polish is obtained by first brushing the stove with a syrupy mixture of lamphlack and soluble glass, and letting dry for twenty-four hours. Then apply a syrupy mixture of blacklead and mucilage, and polish by brushing before the last coat dries.

Good Health.

Talk at Dinner.

The English medical paper, the *Lancet*, has had a pertinent article on Fast Eating, and this article has gone the round of the American papers, so that the public shall benefit by it. Who does not know that fast eating is a bad practice, and who does not practice it all the same? The greatest sinners in this respect are the commercial men, who can be seen in shoals in commercial quarters, gulping down their dinners and luncheons, crying "check," then rushing off with the last morsel sticking in their throats, or perhaps the final crust between their fingers, to be finished in the street.

All things have their time, so has eating and drinking. Could man or woman turn their vision within and see how that poor misused organ, the stomach, wriggles and contorts before it can accommodate itself to the mass that is thrown into it, man or women would have pity upon it and begin to reflect that the course pursued was not the right one.

People who eat fast should order their coffins, insure their lives for the benefit of their families and never start on hazardous journeys. It may be their last. More apoplectic fits are brought on by fast eating than by anything else; more indigestion and dyspepsia is the result of rushing down the food than of the food itself; more constipation is brought about by holding meals than by the meals themselves.

Eat leisurely and you will enjoy the benefit of what you have eaten. Rather do not eat at all than eat fast, for hunger will not injure you as much as fast eating.—*Food and Health.*

Malaria.—Of all the diseases with which mankind is afflicted, perhaps not one is less understood and more vaguely defined than malaria. All professional opinions in regard to it are chiefly theoretical, and the opinions which are contained in a little treatise on malaria, written by Joseph F. Edwards, M. D., form no exception to the rule. But the author frankly acknowledges that his theory should not be accepted unless it can be rigidly verified by ample proof educed in the future. He claims, however, that, irrespective of his theory, what he says will be the means of enabling the reader "to avoid very much of the suffering which is directly or indirectly traceable to malaria," and the common-sense manner in which he handles the subject shows that he has not overrated his claims. He says that the word malaria is derived from the two words *mal aria—bad air,* and he closely conforms his arguments and statements to this definition, thereby avoiding much confusion and vagueness. He says that the principal cause of malaria is organic decomposition, and maintains that "the surest way to avoid malaria is to remove this matter from your presence while it is undergoing decomposition." In other words, he believes an ounce of prevention is worth a pound of cure. The book is written in a plain and popular style, well-adapted to the understanding of non-professional readers.

Bread from Bark.

It is well known to the botanists that many plants besides those commonly used for food, contain nutritive elements. Nearly all plants contain starch. The barks of several aspens and pine trees contain so much of this substance that it can be extracted from them as from potatoes by trituration with water. It exists also in the roots and other parts of perennial plants to such an extent as to have been employed in the preparation of bread in families. In illustration of this we quote the following directions, given by Professor Autenrieth, for preparing a palatable and nutritious bread from the beech and other woods destitute of turpentine: "Everything soluble in water is first removed by frequent maceration and boiling; the wood is then to be reduced to a minute division, not merely into fine fibers, but actual powder; and after being repeatedly subjected to heat in an oven, is ground in the usual manner of corn. Wood thus prepared, according to the author, acquires the smell and taste of corn flour. It is, however never quite white. It agrees with corn flour in not fermenting without the addition of leaven, and in this case some leaven of corn flour is found to answer best. With this it makes a perfectly uniform and spongy bread, and when it is thoroughly baked and has much crust, it has a much better taste of bread than what in time of scarcity is prepared from the bran and husks of corn. Wood flour also, boiled in water, forms a thick, tough, trembling jelly, which is very nutritious."

The Sanitary Science of the Pentateuch. A writer in the *Journal of Science* thinks that the knowledge of sanitary science possessed by Moses was in advance of that of today. He says: "So peculiar is human progress that it has taken 3,000 years to bring the civilized world to a point less advanced than that occupied by Moses. Less advanced we say, emphatically, because if we now admit the value of personal cleanliness, the importance of avoiding putrescent and loathsome matters, and of expelling them rapidly from our cities, and if we are theoretically aware of the disinfecting and deodorizing power of earth, we are far from embodying this, our knowledge, in the practice of actual life. As to the avoidance of blood of the flesh of foul-feeding animals, and of such as are liable to introduce entozoa into our systems, we do not recognize even verbally the importance of the Mosaic teachings. We eat 'blood puddings,' we feed swine with blood and with foul-smelling offal, and then we eat the animals which have been gorged on this revolting diet. And we pay the price of this uncleanliness in shortened lives and in waning vigor. We again call attention to the remarkable physiological insight displayed in the sanitary code of the ancient Israelites, and we repeat the question, Whence did it spring?"

Unwholesome Sleeping Rooms.—In many houses bed-rooms about seven by nine ft. in size, or not much larger, are found, in which two persons are often expected to sleep, and that too, sometimes, with closed window and closed door. If the carpenter who finished the room had been an extra good workman and had made the room pretty near air-tight, the two lodgers, or the one, who went to bed in one of these closed rooms at night would afford the undertaker a job next morning. These small, close bed-rooms are propagating beds for consumption, and prove perfectly successful. So successful, indeed, are they that about one-fifth of all the people who die in some portions of the country—New England, for instance—die of consumption. There are thousands of these small bed-rooms in New England, hence the large harvest of death from consumption. No room less than 12 ft. or 14 ft. square, and from 7 ft. to 10 ft. in hight, is fit for a sleeping room, and even then there should be ample ventilation.

A New Planing Device.—A very simple method of planing at any required angle the edges of boiler and other plates, where this is needed to facilitate calking, is thus described by the *Engineer's* Mancheeter correspondent: "Instead of packing the plates at the required angle on the machine, as usual, the tool itself is made to work at any desired angle. This is accomplished by a swivel head, working upon two trunnions and moved backward and forward by a worm and worm-wheel, and which is locked fast in any position by means of bolts in radius slots on a radial plate attached to the slide. The machine itself consists of a long bed with a raised part for carrying the plates, and above this a girder with clamp screws for holding the plates in position. The tool is arranged to cut both ways, and is moved by a screw with reversing action."

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Passing Events.

The debris case at Sacramento is still continued. In another column we refer to it more fully. A great deal of the testimony taken is of course a repetition, nearly, of that previously elicited, and it is only occasionally that any important or interesting facts come to light.

The event of the week has been the hearing of the news of the *Jeannette* Arctic expedition. The reports are so far somewhat contradictory, but it is certain that Lieut. De Long has accomplished nothing. It is good to know that no lives have been lost, and that all hands will, within a few months, be back home again, safe and sound, but not very much wiser.

Another week and 1881 will be added to the long roll of finished years. Now that Christmas days are with us, we feel that with a prosperous future before the country, the holiday greetings will be more fervent and full of meaning than usual. "Happy New Year" will be, before long, the wish of many, and it is likely to the many it will be fulfilled. Our coast is now awakening to renewed activity and industrial progress, and we feel certain that the coming year will be one of undisturbed prosperity.

As to the PRESS, it intends keeping pace with the times and increasing its usefulness as it does in age. Reflecting as it does the state of industry in the community where it exists, its prosperity is assured. With this future in store, we can with heartiness renew our efforts to advance and improve, and we trust that our readers will find our determinations will meet with approval, and that they will second our efforts by assisting us with contributions both literary and pecuniary.

THE bill introduced by Representative Pettibone, relative to the retirement of army officers, provides that all general officers and officers of the different staff corps shall be retired from active service when they have served 45 years in the army, and all officers of the line shall be retired when they have reached the age of 60.

Annual Expenditures on Claims.

As the first of January approaches, miners are always in a state of excitement about the annual expenditures on their claims, and they are always more or less confused as to the law on the subject, though it is quite plain now. In order that they may be fully informed on the subject, we have gathered from various sources mining laws, decisions of the courts and of the Secretary of the Interior, rulings of the commissioner, regulations of the Land Office, etc., everything that we could on the subject of annual expenditure, and herewith present it for preservation and reference:

In the first place the section of the law referring to this subject is as follows: "On each claim located after the 10th day of May, 1872, and until a patent has been issued therefor, not less than $100 worth of labor shall be performed in improvements, made each year. *Provided*, that the period within which the work required to be done annually on all patented claims so located, shall commence on the first day of January, succeeding the date of location of such claim; or all claims located prior to the 10th day of May, 1872, $10 worth of labor should be performed in improvements made by the 1st day of January, 1875, and each year thereafter, for each 100 ft. along the vein, until a patent has been issued therefor; but where such claims are held in common, the expenditure may be made upon any one claim; and when a person or company has or may run a tunnel for the purpose of developing a lode or lodes, used by said person or company, the money so expended in said tunnel shall be taken and considered as expended on the lode or lodes, whether located prior to or since May 10, 1872, and such person or company shall not be required to perform work on the surface, to hold the lode as required by the act.

"Upon the failure to comply with the foregoing conditions of annual expenditure, the claim or mine upon which said failure occurred, shall be open to relocation in the same manner as if no location of the same had ever been made; *provided*, That the original locators, their heirs, assigns or legal representatives have not resumed work upon the claim after failure and before such location. Upon the failure of any one of the several co-owners to contribute his proportion of the expenditure required, the co-owners who have performed the labor or made the improvements, may, at the expiration of the year, give such delinquent co-owner personal interest in writing, or notice by publication in the newspaper published nearest the claim for at least once a week for 90 days, and if at the expiration of 90 days after such notice in writing or by publication, such delinquent should fail or refuse to contribute his proportion of the expenditure required, his interest in the claim shall become the property of his co-owners, who have made the required expenditures."

It takes 90 days after notice in writing, or 180 days after notice by publication before the delinquent partner can be dropped.

After you have made application for a patent, no further annual expenditures are required.

On claims located before May 10th, 1872, the law requires $10 a year on each 100 ft.; but where a number of such claims are on the same vein or lode, the aggregate expenditure necessary to hold all the claims, at the rate of $10 per 100 ft., may be made on any one claim.

By an amendment to the mining law, passed Jan. 22, 1880, it is provided "That the period under which the work required to be done annually on all unpatented mineral claims shall commence on the 1st day of January *succeeding* the date of location of such claim, and this section shall apply to all claims located since May 10, 1872."

It is held by the Land Office, that under this section, labor performed or money expended on a mining claim prior to the 1st day of January succeeding the date of location thereof, will *not* be considered as a part of or applied to upon the first annual expenditures required by law. Thus, upon a claim located at any time during the year 1880, the *period* within which the labor must be performed commences January 1st, 1881, and *during* the calendar year 1881 the annual expenditure must be made, or the claim will be subject to re-location, on and after January 1, 1882.

This point is an important one for miners to remember, inasmuch as it has been decided that where a claim was located October 1st, 1879, and the $100 worth of expenditure and labor was made after the location but *before* January 1st, 1880, that expenditure is *not* a compliance with the law; it must be during the calendar year 1880, *except* so much as is required by the local law. If the local law says 10 days' work must be done within 20 days from location, do the 10 days' work of course; but that work if done before the 1st of January succeeding the location will not count as expenditure required by Government laws.

In order to apply the law to a claim located prior to 1880, it will be necessary to calculate from the date of location. For instance, upon a claim located in 1875, the first expenditures would be reckoned as due within one year from Jan. 1, 1876, to wit: Jan. 1, 1877, and annually thereafter by the calendar year.

Of course it will be understood that this work may be done at *any* time during the calendar year.

Now, after you have done your labor, go and have it recorded. This can be done with the District Recorder, who may visit the claim and see for himself, but if he does not, a sworn statement will answer. If there is no District Recorder, leave your proof with the proper Recorder of Deeds for the county where the claim is situated; or the nearest Recorder to the claim wherever he may be.

The following form, taken from Copps' American Mining Code, is the proper one to fill out and record:

Proof of Labor.

State of———, County of———

Before me, the subscriber, personally appeared———, who, being duly sworn, says that at least——— dollars worth of labor or improvements was performed or made upon [here describe the claim], situated in——— mining district, ———county, ———State (or Territory) of———, during the year ending———, 188-. Such expenditure was made by or at the expense of———, owners of the claim, for the purpose of holding said claim.

———Signature.

[Jurat]

The record of an affidavit like the above is *prima facie* evidence of the performance of such labor.

Work done outside of a mining claim, with intent to work the claim, to be considered by intendment as work done on the claim, must have direct relation, and be in reasonable proximity to it.

Roads and necessary work may be included in the estimate.

Work done outside a claim for the purpose of prospecting or developing it, is as available for holding the claim as if done within the boundaries of the claim itself.

Where one person or company owns several contiguous claims capable of being advantageously worked together, one regular system may be adopted to work such claims; and work done according to such system for the purpose of prospecting or working all such contiguous claims, although done only on one of such claims, or even outside of all of them, is available to hold all such contiguous claims intended to be worked or prospected by such general system.

The fact that a large expenditure has been made upon a claim in the past will not release a claimant from the necessity of performing the required annual labor.

Failure to perform the labor or make the improvements required by Section 2,324 of the Revised Statutes, between the dates of entry and delivery of patent does not work a forfeiture of the rights acquired by entry, nor demand cancellation of the same, when such failure is brought to the attention of the General Land Office, by such relocation or otherwise.

The annual expenditures are necessary to support the possessory title only.

The act of Congress of Jan. 22, 1880, does not annul a provision of a State law which requires a discovery shaft to be sunk within a certain number of days from date of discovery.

A party who contributes his proportion of the *required* expenditures, can retain his interest in the mine. If the party fails to contribute his proportion of the *actual* expenditures upon a mining claim, the remedy must be sought elsewhere than in the General Land Office.

The Surveyor-General is not required to make a separate certificate as to the $500 improvements on a claim. Such a certificate is endorsed on both the flat and the field notes of survey of the mining premises in question.

The Surveyor-General, if not satisfied from the evidence on file that the required amount has been expended upon the applied-for lode by the applicant or his grantors, will require further evidence on this point before furnishing his certificate.

Hearings may be had to determine whether the legal expenditure has been made in a mine for which patent is desired.

An expenditure of more than $1,500 by the owners of an adjoining mine on the portion of a tunnel running through the premises embraced in an application for patent, in case the applicants were to have an interest in said tunnel, is considered an expenditure under the mining law upon the claim applied for.

In estimating the $500 expenditures essential to authorize entry, improvements made by former locators who had abandoned their claim, cannot be included.

Where a party applies for a patent for a relocated mine, it will be necessary for him to offer satisfactory proof that a sum of not less than $500 has been expended upon the same by the applicant or his grantors.

Annual expenditures are *not* required on placer claims, they being subject only to the operation of local laws, rules, regulations and customs.

The rules and customs of miners in a particular district are laws, and constitute the American common law of mining for precious metals.

Any citizen who is entitled to locate a lode on the public domain, may perform all the necessary acts of appropriation through the agency of others.

No specified amount is required to be expended to retain the ownership of a tunnel location; but locators are required to use reasonable diligence, and a failure to prosecute work for six months will be considered an abandonment.

The expenditures required upon mining claims may be made from the surface or in running a tunnel, for the development of such claims; the act of Feb. 11, 1875, providing that when a person or company has or may run a tunnel for the purpose of developing a lode or lodes, owned by said person or company, the money so expended in said tunnel, shall be considered as expended on the lode.

The Gold Run Case.

The taking of testimony in the now noted Gold Run case continues at Sacramento. The bulk of the testimony has proved what everybody in the State knows and admits, that the old river channels have for years been gradually filling up, and that there are large deposits of sand and sediment in and along the rivers of the valley which must necessarily have been carried there by the flow of the water from the hills and mountains. What proportion of these deposits came from the hydraulic mines is a subject of as much uncertainty as ever, and that any perceptible quantity of the said sand and sediment was washed from the mines of defendant, during the present ownership, is certainly not proven by the prosecution.

Some very interesting testimony has been elicited in the examination of Mr. Hamilton Smith, Jr. Among other things he cites the sizes of the reservoirs of leading companies:

The reservoirs of the Bloomfield company have a capacity of 1,050,000,000 cubic ft.; the Milton company's reservoir has a capacity of 650,000,000 cubic ft.; the Eureka Lake company, 1,130,000,000 cubic ft.; the Fordyce and the many other reservoirs of the South Yuba company contain about 1,800,000,000 cubic ft.; the Omega and the Blue Point United, 300,000,000 cubic ft.; the Spring Valley, 300,000,000 cubic ft.; the California Water Company have nearly 600,000,000 cubic ft.; the El Dorado company's reservoirs have a capacity of 1,070,000,000 cubic ft. There are also a number of small reservoirs on the Feather, Yuba, Bear and American rivers, whose collected capacity I estimate at 700,000,000 cubic ft., making a total of 7,600,000,000 cubic ft. of storage capacity of water. I am personally familiar with all these reservoirs except those belonging to the California water company and the El Dorado company. The water from these reservoirs is generally drawn from the middle of July on, for the next four months, during the dry season.

If this water was drawn regularly for the period of four months it would make a flow of 720 cubic ft. per second, which in a river 500 ft. wide, with a current of 1½ ft. per second, would increase its depth .95 of a ft. I know from my own knowledge of these reservoirs that the water is exhausted from them during this period of four months, and it is generally quite regularly drawn. The mines depend upon this supply of storage of water for the water which they use from the middle of July generally until the middle of November.

These reservoirs have a perceptible effect in restraining floods.

As an illustration, I may say that the mining reservoirs on the Yuba river will hold an aggregate amount of water equal to the discharge of the Yuba river at extreme flood for 24 hours. It would require the Yuba river to pour out its full flood for 24 hours to fill these reservoirs, and I have never seen that river remain at full flood for 24 hours. It has been very frequently proposed by engineers to restrain floods by the erection of reservoirs, and has been done in some cases I believe.

Mr. Smith thinks that the statement that the American and Sacramento rivers were clearer from sediment this year than for some time, was not due to the stoppage of hydraulic mining. On the American river there is one mine stopped by injunction; that was the Gold Run mine. The injunction was served after the usual supply of water was exhausted. It would have worked no more in any event. There were five mines stopped by injunction in Nevada county—the Excelsior, North Bloomfield, Milton, American and Blue Tent companies. They were stopped early in June. All those five mines in Nevada county are working this deep and heavy blue gravel, in which the duty of a miner's inch varies from two and a half to four yards. By these injunctions the water which would have been used in these mines on that deep and heavy gravel was sold to other companies, who used it in washing top or surface ground, so that the ultimate result of the stoppage by injunction was to discharge into the rivers the surface gravel instead of bottom and heavy gravel. Therefore, so far as these injunctions or suits are concerned, there was more debris discharged into the Yuba river than would otherwise have been the case. The only possible explanation I can give, as far as mining is concerned, is that generally throughout the mining district they are working more bottom than surface gravel. The general tendency now is to work bottom gravel instead of top gravel.

A MINING SUIT.—Carmel W. Beach has brought suit against J. B. Cooper, A. B. Cooper, Geo. A. Ball, John McNiel, Manuel San Pedro and the Alexander Mining Co. for an accounting of the individual defendants to the Alexander Co., and to restore to the stockholders thereof all moneys and property belonging to the company, and to enjoin the officers of the company from proceeding to enforce an assessment levied upon the capital stock of the company on the 31st of October last, so far as it affects the stock claimed by the plaintiff. The complaint alleges fraud and conspiracy upon the part of the defendants in the management of the Alexander Mining Co., in the Grantsville mining district, Nye county, Nev.

Assay of Manganese.

The following method of assaying manganese is taken from C. H. Aeron'e "Leaching Gold and Silver Ores":

Take a short necked flat bottomed flask of three nnnces capacity, snch as shown in the engraving, and fit into it a cork through which pass two glass tnbes of abont one-eighth inch bore. One of the tnbes mnst extend nearly to the bottom of the flask; the other, about three inches in length, is bent to a right angle abont an inch from one end, the shorter limh being passed thronqh the cork. Now take the barrel of a small glass syringe, such as is used for medical purposes, the orifice of which must be enlarged by cutting off a portion of the beak. Fit a cork to the larger end, and through it pase the disengaged end of the bent tube, the other end of which is in communication with the flask. Place in the syringe eome pieces of pumice stone, and moisten them with sulphuric acid; attach to the bent tuhe hy means of the cork. A test tube suspended from the neck of the flask completee the apparatus, which is represented by the accompanying cut.

Weigh 99 grains of the finely pulverized manganese which place in the flask. Add one ounce of cold water, and then 150 to 160 graine of sulphuric acid. Replace the cork in the neck, with the glass tubes, and applying the lips to the orifice nf the syringe, suck air through the flnsk. This ie done for the purpose of removing any gas which tbe acid may cnuse to be evolved from impuritiee in tbe manganese. Now weigh 150 graius of oxalio acid which plaoe in the test tube, put the entire arrangement upon the pan of a balance which will indicate one-tenth grain, and counterpoise it.

Remove the apparatns from the balance, throw the oxalic acid from the test tnbe into the flask, cork instantly and set aside for a short time. When effervescence ceases, warm slightly, which will renew it, and when no more gas is evolved draw sir throngh the flask as hefore. Place the entire apparatus again on the scales. It will be found to be lighter than before, and the nnmber of grains required to restore the equilibrium will be the percentage of biuoxide in the sample.

This method, while not rigidly accnrate, is sufficiently so for practical purposes. It depends on the circumstance that oxalic acid, in presence of sulphuric acid and manganese binoxide, is converted into water and carbonic acid gas, (cnrbon dioxide). The water remains in the apparatns. The gas escapes through the tube containing pumice imbued with sulphuric acid, which retaine any vapor of water which might otherwise pass off, the last portion of the gas being drawn ont by the mouth as directed. Thus nothing hut the carbonic gas escapes, and as 99 graine of pure binoxide produce almost exactly 100 grains of the gas, it followe that the weigbt lost corresponds to the percentage of binoxide in the sample.

Having assayed the salt and manganese, the relative proportion in which they should be used remains to be considered. It has already been intimated that practice does not conform strictly to theory, not because the theory is incorrect, but hecause the oonditione attainable in working do not admit of its complete realization. Hence it is found necessary to use sulpburic acid in excess of tbe chemical equivalent of the manganese, and ae sulphuric acid is only nseful in conjunction with a snfficient quantity of salt, the latter must also be in excess of tbe manganese.

For thie reason, instead of only 27 ponnds of pure salt to 20 pounds of manganese hinoxide, we use 36 pounds; these qnantitiee usually suffice for the chlorination of three tons of roasted ore. In order to ascertain bow many ponnds of the impnre materials mnst he used, it is only necessary to divide the quantity of the pure snhstance required by the fraction representing tbe percentage found in tbe assay.

Example: Suppose the assay of the salt gave 87 per cent, it is required to know how mnch of it is equal to 36 pounds of pnre salt, then $36 \div .87 = 41.37$ pounds; again, if the manganese is 66½ per cent, then $20 \div .665 = 30$ pouuds of tbe manganese to 41 pounde of the salt, wbich is about the proportion generally nsed, bnt either or both of the eubstances may vary from this supposition.

Ae to tbe acid, the qnantity requited depende so much on the temperature of tbe generator, and the nature and qnantity of the impurities in the other materials, that no other rule can be given than this; it must be added in emall portions as long as it continues to develop a nseful qnantity of chlorine. It will soon be diecovered how mucb ie required for a given quantity of salt and manganese.

The strength of the acid is indicated by ite density, as measured by a Beaume hydrometer, wbicb is eimply a floating gauge—the bigber it floate the stronger is the acid, and the reverse.

Mining Superintendent Resigned.—Geo. S. Powers, who recently reeigned hie poeition ae euperintendent of the Blue Tent hydraulic mine, proposee to pay a visit to tbe Eastern Statee before long. Mr. Powers, during bis mauagement of that property, has shown himeelf to he energetio and indefatigable in the discharge of hie duties; bnt the presence of an injunction and the lack of water render his fnrther services unnecesoary. Like ex-Superintendente McMurray, O'Brien and Perkine, he finde his occupation gone.—*Nevada Transcript.*

Irrigating Water Wheels.

[Written for the Press by Albert Williams, Jr.]

A very simple expedient for raising and distributing water from main irrigating ditches ie illnstrated by the accompanying engravings. In many cases where the ground is nearly level a lift of from 4 to 10 ft. is sufficient; nnd this may be cheaply and effectively attained by the nse nf an undershot wheel, carrying self-emptying water boxes, like the one sbown, or constructed ou the same principle with modifications. This system is one of the many ingenious contrivances in which modern mechanical progress has been forestalled by the Asiatic races, by whom it hnd been employed for centuries previoue to being borrowed, or, more probably, re-invented, in thie country. It is now adopted qnite extensively in many placee where the conditions are favorable, and gives very eatisfactory results.

There are mnny cases where the irrigating water wheel comes into play successfully. To define them, the requirements may be stated as:

First—That the water should be bronght by ditchee from eome constant source, as a river, reservoir, lake or other body of water.

Second—That it shonld hnve, at tbe point of delivery, a considerable velocity, eay two miles an hour, or more. With higher velocitiee the results, up to a reasonable limit, are better.

Third—That there shonid be efficient volume of water to allow epace for the buckets to work in.

Fourth—A surplus of water over the amount required to be delivered at any given point.

Fifth—That it ehould be necessary to lift the water only to a moderate hight—the system working better with a six-ft. lift, for instence, than if it be required to raise the water 12 ft.

Given all tbe above conditions, tbe undershot water wheel may be safely relied on, and wherever it can be nsed at all, it can he used advantageously and economically. It is far from being a perfect mechanical contrivance, and is admittedly wasteful of power; hut if the water raised is sufficient for its purpose, the balance not utilized except as a mean of driving the wheel may he disregarded, or may be brougbt into service in irrigating lower portione of the land or in working similar wbeels at various pointe down stream.

In the cuts, Fig. 1 ie a eide elevation showing the general method of construction. Eight paire of arms, carrying plain flat buckets like those of a steamboat paddle-wheel extend from a hub rotating on metal bearings. At either end or both ends of each bucket are fixed water-boxes wbich fill themselvee on entering the water, and on being brougbt to the highest point of rotation empty themselves into a receiving trough. This trough supplies the distributing ditches, etc., and its inner end is so placed that it comes nnder the projecting buckets of tbe wheel witbout interference with the motion of the arms. The current of water in the channel underneath forces the buckete down stream, the latter delivering in the opposite direction at the top. By using a double eet of buckets, one at each end of each bucket, the water may be delivered on both eides simultaneously. A little experimenting will indicate tbe proper size of the boxes, whicb depende upon the velocity and volume of water in the channel as well ae the amonnt to be delivered.

Such a wheel can be readily constructed by any mechanic, and will cost from $25 to $50, according to size and workmanship. It may be made altogether of wood, with the exception of the bearings, but for the larger sizes (of from 8 ft. to 15 ft. or npward) it is advisable to brace well with wrought-iron tie rods. The water boxes may be made of wood, bnt perhaps the most convenient arrangement is a set of tin cracker-boxes, or some similar metallic receptacles—the eize choson to be in direct ratio witb the force of the current. It is not nsual to paint the wheele unless iron enters largely into the constrnction, in which case red lead may be nsed.

A large number of wheels similar in general construction to the one shown, are in use in the Boise river valley, Idaho. At Boise City where the gardens are remarkable for their beauty and constant verdnre, irrigation is conducted by a eeries of these wheels, which, from their simplicity and effectiveness fully meet all requirements. In some places this wheel may be used of course, to bring water to mines.

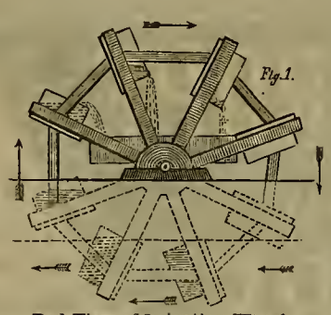
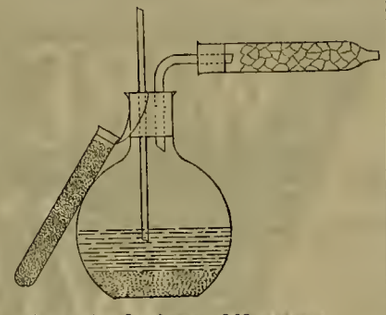


Fig. 1.

End View of Irrigating Wheel.



Apparatus for Assay of Manganese.

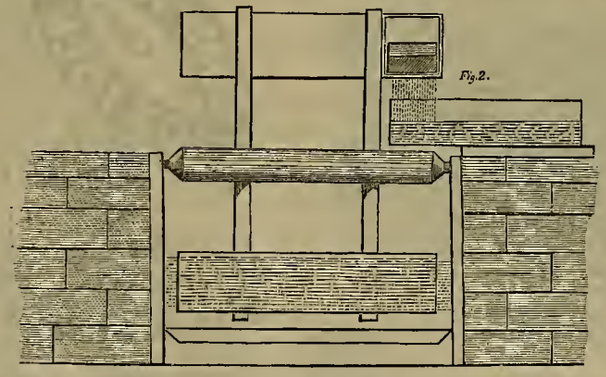


Fig. 2.

UNDERSHOT IRRIGATING WHEEL—FRONT VIEW.

New Mining Laws.

Beside the debris bill introduced in Congress, and which we refer to elsewhere, other bills interesting to the mining commnnity have been submitted. Congressman Davis, of Illinois, has introdnced in the House of Representatives a bill to amend the mining law, to provide "that in any case where, between two locatione on the same lode or vein, or between a location and any natural object which forms a visible or apparent termination of such vein, there shall he a remnant or portion of said lode or vein not exceeding 1,500 ft. in length, not located or otherwise appropriated for the space of one year, and the same shall not be open and visible or readily accessible to any part thereof by reason of being deeply covered or otherwise inacoessible, it shall he lawful for the owner or claimant of either of the adjoining ends of said lode or vein to make the claimant or owner of either of the adjoining ends of said lode or vein to make a claim to such unlocated remnant, and to locate it as an extension of the lode held hy him, and to obtain a patent for it witbout performing the labor required in case of the discovery and location of an original claim." The bill further provides, that in case application bas not been made for a patent on euch original claim, the application for it mny include tbe extension as aforesaid in all such unappropriated tract that the locator set up notice, and file certificate of location, indicating hie claim to such tract as an extension of the adjacent lode; provided, however, that snch owner shall apply for a patent on each remnant within two years after sucb location, or it shall be held as abandoned and open for location as in other cases.

Mr. Davis has also introduced a hill to amend the act of June 3, 1878, authorizing the citizens of Nevada, Colorado and the Territories to take timber from the public domain for mining and domestic purposes, by adding to its firet section a provieo as follows: "Provided that nothing in thie act shall he conetrned to authorize any perseon other than the holder of a claim or location upon a mineral lode, or other mineral land, made and held pursuant to lawe relating to mineral lands, to enter upon encb claim or location, and cut, remove or destroy, or otherwise injure, the timber upon euch claim or mineral location."

The Idaho mine, Grase Valley, yielded $48,000 in November.

Cookes'-Mitchell's Assaying—No. 2.

[Written for the Press by C. H. Aaron.]

An omission from the old work, which sbould be, and is not, supplied in the new, occura in the direotions for assaying ores for gold and silver. It ie this: No mention is made of the fact that certain highly oxidized ores require the addition of an extra quantity of carbon, flour, or other reducing agent, in order to produce the requisite quantity of lead for cupellation. If a preliminary nssay of such ores be made according to the direotions given, no lead will be obtained. From the further directions, the etudent will infer that the addition of six grains of carbon in the assay proper will reduce from the litharge about 180 grains of lead, but in tho case of an ore containing much iron peroxide, for example, he will find little or no lead. This is perplexing to students.

Roasted pyrites require just double the usual quantity of carbon ns compared with an ordinary ore which gives no lead in the preliminary assay. Some ores containing chromium also reqnire an extra dose. In euch cases a preliminary assay of the ore may be made with a large nnd known quantity of the reducing ngent, and the assay proper dressed according to the result. The applicability of the assay made with nails to sulphuretted ores of gold and silver, a method much used in this country, and which properly conducted gives results as high as any in most cases, and possesses several advantages, should be mentioned, as well as the conversion of an oxidized into a sulphnretted ore, or of a metal into a sulphuret by an addition of sulphur to the assay, as described in my hand-book on "Leaching Gold and Silver Ores," it being very convenient in certain cases. Sulphnr is alsn useful in certain assays of tin, nnd arsenic in assays nf nickel, cobalt, etc., especially for the purposes of prospecting, and under circumetances which forbid tbe use of the complicated wet methods.

That which I call the nail assay is similar to the method described by Mitchell as applicable to the assay of galena for lead, except tbat, when the ore contains little or no lead, a sufficient quantity of litharge is added to produce the requisite lead button. The method is best adapted to sulphuretted ores, and is especially convenient from the fact that, as all the litharge used is reduced to lead, the weight of the button is under perfect control without the necessity of a preliminary assay. Many mill men employ it for all ores, using about half an ounce of litharge, some charcoal or flour, two or three tenpenoy nails, and as much soda and borax as will suffice to effect thorough fusion, to half an onnce of ore, frequently adding a fragment of glass. Of course, if the ore contains a considerable quantity of sulphur, there is no necessity for using charcoal or flour, and if it contains mucb quartz, tbe glass is also superfluous; but one of the merits, perhaps the chief merit of the process is, that even if these things are not necessary, yet they do no harm, so that a general formula answers for almost any kind of ore, and a person who is not competent to select those modifications which are indispensable in other methods, may nevertheless make an assay in this way with confidence in the result.

If, however, this process is used indiscriminately for all classes of ore, a case may be met with in whicb a slight modification is desirable. It is that of oxidized ores containing mnch copper. These ores generally indicate the presence of copper hy a blue or green color (carbonates, arsenistes, etc.), but the oxide of copper is black, the suboxide red. Such ores, when assayed with or without tbe use of nails, generally yield a button of lead containing a considerable quantity of copper, whicb causes a loss of precious metals in the cupellation.* Now, if to such ores we add a sufficient quantity of sulphur to convert the copper and litharge into sulphides, and uails to metallize the sulphide of lead so produced, the copper remains in the form of a matte, and a good lead button is got for cupellation. It is not necessary to adjust the quantity of sulphur exactly, as the nails will take up any excess, so that a general formula might embrace the addition of sulphur to all ores; but as anybody who knows even a little about ores can easily distinguish those that contain much sulpbur from those which do not, this is not necessary.

The chief point to he observed in thie assay is, that it be kept in the fire until the nails, when taken out, shall have no lead adhering to them so that it cannot be rinsed off in the liquid slag. I am well aware that some professional assayers consider this method to he imperfect, but I can assure your readers that it will give, in nearly every csse, as high results as can be got by any other fire assay, while possessing the advantages indicated. In only one case bas this method failed in my hands, and in that case all crucible methods failed, a correct result being gotonly by scorification. The substance operated on was a highly arsenical matte from a emelting furnace.

*The use of an abundance of litharge will prevent the copper from coming down, but is very destructive to the crucible.

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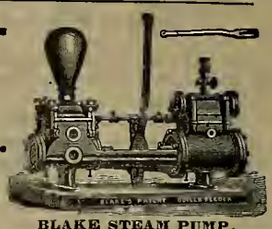

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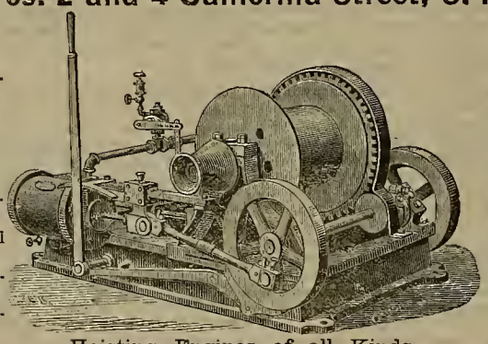

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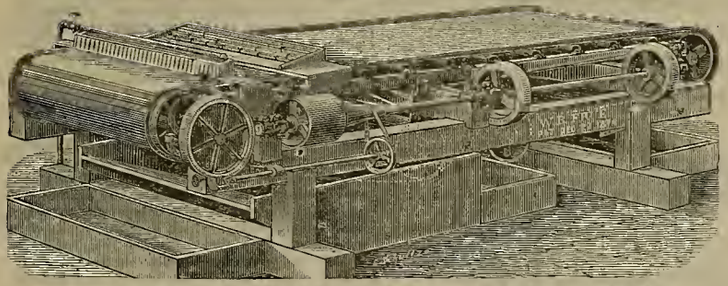

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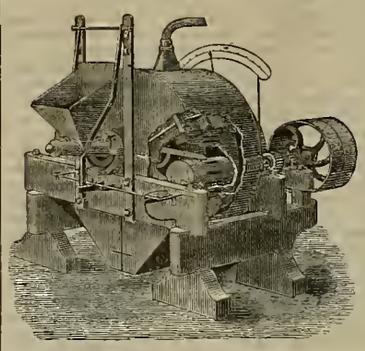

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ALEX. DEL MAR,
Mining Engineer,
Late Director of the United States Bureau of Statistics Mining Commissioner for the United States Monetary Commission, etc., No. 216 Sansome St., San Francisco. Cable address—"Del Mar, San Francisco." Branch Office, 61 Broadway, New York. Cable address—"Del Mar, New York." London Agency: H. Stodes & Co., 24 A. Southwark St., S. E. Cable address—"Del Mar, London." Paris Agency: J. H. McDonald & Co., 13 Rue St. Lazare. Cable address—"Del Mar, Paris."

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NOTICE.

The office of the STETEFELDT FURNACE CO., having been removed to New York, parties wishing to obtain information in San Francisco about the Stetefeldt Furnace will apply to Messrs. Prescott, Soott & Co., Union Iron Works, San Francisco. C. A. STETEFELDT

SHEET IRON PIPE.

FRANCIS SMITH & CO.,
Manufacturers of
THE PATENT CHANNEL IRON WHEELBARROWS.
THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand
SHEET IRON PIPE.
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Arteeian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.
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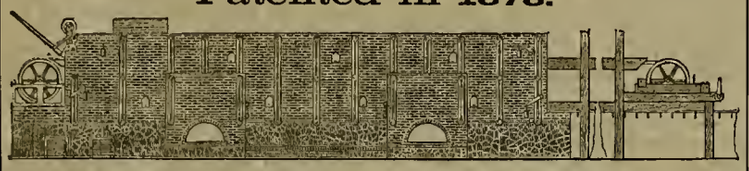
SHEET IRON PIPE.

THE O'HARRA
CHLORIDIZING FURNACE.
Patented in 1878.

SIDE ELEVATION OF THE O'HARRA FURNACE.
This Furnace is Constructed with two SEPARATE HEARTHS, one for DESULPHURIZING and one for CHLORIDIZING the Ore.
BOTH PROCESSES ARE PERFORMED AT ONE OPERATION.
An endless chain carrying conveyors or scrapers passes continuously through over both hearths, going one way through one chamber and the other through the other chamber. By this means the ore is fed and discharged at the same end of the furnace.
A cheap Furnace to build and to run.
The process is essentially the same as the well-known Freiberg process; but the mechanical devices applied to the furnace and the peculiarity of its construction enable the inventor to thoroughly desulpburize and chloridize the ore to a higher percentage than other furnaces, and with less cost for fuel and labor.
At Washoe and Ophir Tailings Mill it costs $1.10 per ton to work 40 tons in 24 hours.
At the Exchequer Mill, Alpine County, 20 tons are worked in 24 hours, at a cost of $2.61½.
Lewis Chalmers, of the Isabella G. & S. M. Co., Silver Mountain, Alpine Co., says: The O'Harra Furnace did all that is represented in the MINING AND SCIENTIFIC PRESS, roasting and chloridizing at the figures there given, antimonial and arsenual sulphurate of silver up to from 84% to 95% of the assay.
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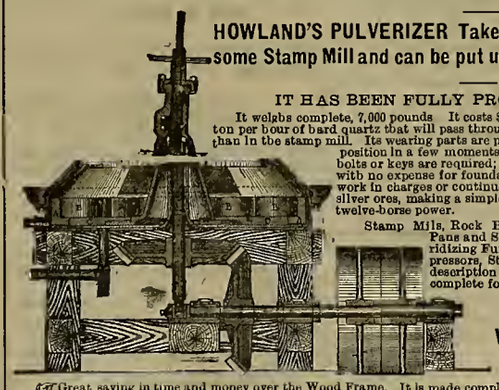
MANUFACTURERS OF
Gold and Silver Grinding and Amalgamating Machinery

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IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.
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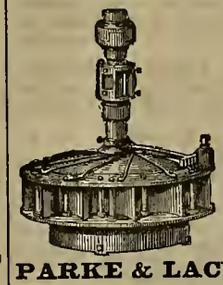
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SMELTING and LEAD CO.,
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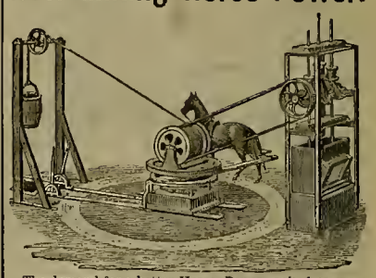
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

New Mining Horse Power.

The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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This Pick has adjustable points, all steel and for prospecting purposes. It can be used as a Pick, Hammer and Hatchet; for farmers used as a Pick, Hammer and Mattox. For mining purposes it will save more than one-half of the expense. Address
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING DECEMBER 6, 1881.

250,495.—BREECH LOADING FIRE ARM—Thos. Burnett, Eureka, Cal.
250,497.—LIFTING JACK—Geo. Caseres, Freestone, Cal.
250,512.—CULTIVATOR.—Aaron Evans and J. Draper, St. John, Cal.
250,510.—TIRE UPSETTER.—Chas. W. Eames, Shasta, Cal.
250,552.—GRINDING AND AMALGAMATING PAN—Isaac Lepley and W. H. Hepburn, Amador, Cal.
250,556.—FIRE EXTINGUISHING APPARATUS—D. R. Lynch, Grass Valley, Cal.
9,960. — PHOTOGRAPHIC APPARATUS — Re-issue—E. J. Muybridge, S. F.
250,385.—ROCK DRILL—H. F. Parsons, S. F.
250,466.—SAFETY STIRRUP—J. C. Wacblte, Sacto., Cal.

FOR THE WEEK ENDING DECEMBER 13, 1881.

250,777.—RAILROAD TRACK GAUGE AND LEVEL—Chas. F. Bergh, Alma, Cal.
250,646.—PIANO FALL AND MUSIC DESK—F. A. Clarke, San Francisco.
250,786.—FEEDER FOR THRESHERS—John P. Cobb, College City, Cal.
250,789.—GRAIN CLEANER — Franklin Dalbey, Sheridan, Cal.
250,794.—FAUIT PITTING MACHINE—Antonio Donatella, Healdsburg, Cal.
250,815.—CABLE RAILWAY GRIP—Frank W. Hopps, S. F.
250,939.—CAR COUPLING—Wm. G. Mills, Merced, Cal.
250,946.—ROLLER FOR SEAMS OF TIN ROOFS—C. D. Morin, Woodland, Cal.
250,841.—TRACE HANGER—W. H. Reyburn, Cuffey's Cove, Cal.
250,860.—CAA COUPLING—J. F. Whiting, Independence, Oregon.
250,867.—PORTABLE HOUSE—W. H. Wrigley, Oakland.

NOTE.—Copies of U. S. and Foreign Patents furnisbed by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All pateut business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

FEEDER FOR THRASHING MACHINES.—John P. Cobb, College City, Colusa Co., Cal. No. 250,786. Dated Dec. 13, 1881. The object of this feeder for thrashing machines is to regulate or distribute the unthrashed straw and grain as it passes upon tbe elevator from the derrick wagon to the feeding device which introduces it to the thrashing cylinder. It consists of new and useful devices attached to and situated over the elevator, such device having independent reciprocating oscillating pickers or tines operating over an elevator, said tines being adapted to have a vertical adjustment as a whole, and to have a separate individual adjustment to regulate their stroke. Where long straw is passed through the thrashing machine it does not require as much check as when short straw is being worked, because the proportion of grain on the former being less the eame amount will not clog the riddles; but when short etraw is being passed through it requires to be checked more because it is more likely to interfere with the thrasher by choking the riddles. The vertical adjustment of the tines either separately or together provides for this; when long straw is being fed they may be raised; when short straw is being fed they may be lowered, so that they may tear the bunches more.

PORTABLE HOUSE.—Wm. H. Wrigley, Oakland. No. 250,867. Dated Dec. 13, 1881. This invention relates to a novel construction for that class of houses which are made in sections and fitted all ready to he set up at any time; and it consists in certain improvements in the formation and method of uniting the parts of the building whereby the inventor is enabled to make a neat, serviceable house, easily set up at any point, and having a complete exterior and interior finish. It can also be built with double walls, which will make it more solid. The interior walls are pierced or cut away below the plane of the floor to admit air from the epace beneath the house, while the space between the walls communicates at the upper end with the space between the raftere of the roof, so as to promote a draft through the space, and thie will keep the interior of the house cool.

TRACE HANGER.—W. H. Reyburn, Cuffey's Cove, Cal. No. 250,841. Dated Dec. 13, 1881. This invention relates to certain improvements in harnesses, and more especially to a new and useful attachment, the object of which is to hang up the traces, and may therefore be called a trace hanger. When the horse is unhitched, and the trace is lowered from the whiffletree, its end ring is brought up to the hanger, which has clasps on it. The slightest pressure opens the device by pressing down on the lower clasp, and the ring steps in between them and is secured therein by the lower. The trace, if caught on anything while the horse is walking off, will not be injured, as it will easily pull out, requiring no more force to release it than to insert it. The only object is to hang it up, and this it does. It is in a most convenient position to receive the trace, and when using a young and restive animal is a decided advantage, because one does not have to go close to him to take out the trace. A slight pull on any portion will remove it,

Christmas and Christmas Observances.

We find tbe following interesting statements concerning Christmas in the latest edition of "Chamber's Encyclopædia:" Christmas, ths day on which the nativity of ths Savior is observed. The institution of this festival is attributed by the spurious Decretals to Telesphorus, who flourished in the reign of Antoninus Pins (138-61, A. D.), but the first certain traces of it are found about ths time of the Emperor Commodus (180-192, A. D.). In the reign of Diocletian (284-305, A. D.), while that ruler was keeping court at Nicomedia, he learned that a multitude of Christians were assembled in the city to celebrate tbe birthday of Jesus, and having ordered ths church doors to be closed, he set fire to the building, and all the worshipers perished in ths flames. It does not appear, however, that there was any uniformity in the period of observing the nativity among the early churches, some held the festival in the month of May or April, others in January. It is, nevertheless, almost certain that the 25th of Dec., *cannot* be the nativity of the Savior, for it is then the hight of the rainy season in Judea, and shepherds could hardly be watching their flocks by night in the plains.

Christmas not only became the parent of many later festivals, such as those of the Virgin, but especially from the 5th to ths 8th century, gathered round it, as it were, several other festivals, partly old and partly new, so that what may be termed a *Christmas cycle* sprang up, which surpassed all other groups of Christian holidays in the manifold richness of its festal nsages, and furthered, more than any other, ths completion of the orderly and systematic distribution of church festivals over ths whole year.

Not casually or arbitrarily was the festival of the Nativity celebrated on the 25th of Dec. Among the causes that co-operated in fixing this period as ths proper one, perhaps the most powerful was, that almost all the heathen nations regarded the winter solstice as a most important point of the year, as the beginning of the renewed life and activity of ths powers of nature, and of ths gods, who were originally merely the symbolical personifications of these. In more northerly countries, this fact must have made itself peculiarly palpable; hence the Celts and Germans, from the oldest times, celebrated the season with the greatest festivities. At the winter solstice, the Germans held their great Yule feast, in commemoration of the return of the fiery sun-wheel; and believed that during the 12 nights reaching from the 25th of Dec. to the 6th of Jan., they could trace the personal movements and interferances on earth of their great deities, Oden, Berchta, etc. Many of the beliefs and usages of the old Germans, and also of the Romans, relating to thie matter, passed over from heathenism to Christianity and have partly survived to the present day. But the church also sought to combat and banish—and it was to a large extent successful—the deep-rooted heathen feeling, by adding—for the purification of the heathen customs and feasts which it retained—its grandly devised liturgy, besides dramatic representatione of the birth of Christ and the first events of his life. Hence sprang the so called "manger songs," and a multitude of Christmas carols, as well as Christmas dramas, which at certain times and places, degenerated into farcee or fools' feasts. Hence also originated, at a later period, the Christ-trees, or Christmas-meats and dishes, such as Christmas rolls, cakes, currant-loaves, dumplings, etc. Thue Christmas became a universal social festival for young and old, high and low, as no other Christian festival could have become.

Academy of Sciences.

Dr. Behr presided at the meeting of the California Academy of Sciences last Monday evening. Among the donations was a gigantic sixth tooth and several large fragments of the jaw and of the vertebral bones of the Mastodon Giganteus, recently found by Wm. T. Lambie, at a depth of 83 ft., while excavating a well at Bowie Station, Arizona. Commodore Thos. S. Phelps, U. S. N., presented a piece of tarred canvas, of which the following is the history: "During the early part of 1881, the U. S. steamer *Lackawanna*, while getting under weigh at the Island of Juan Fernandez, brought up on her bower a much-decomposed anchor of the pattern used during the 17th and 18th centuries, which, judging from ite appearance, had been on the ocean bottom from 150 to 200 years. The anchor is 12 ft. long. The shank has become reduced by decomposition to about one-third of its original thickness, the arme and palme are half gone, and the ring made to receive a hemp cable, which was originally three inches in diameter, has become reduced about two-thirds, and in one place, for about six inches, has rotted entirely away. The canvas parceling, which was wrapped around the ring to prevent injury to the cable, is comparatively well preserved, although the cable and wooden stock have long since disappeared. The endnrance and condition of the canvas, under the circumstances, possesses a signifioant interest.

Lieutenant Frederick Schwatka presented a list of relics found by tbs Franklin search party of 1878-79-80 under his commaud, and a photograph of the medal belonging to Lieutenant J. Irving, R. N., found with and brought home with his bones.

W. G. W. Harford presented a new crab; W. J. Fisher, an Aleut stone-lamp, a slate whale-spear and scraper, spoons and numerous fossils from Alaska. From J. C. S. Stubbs, a collection of invertebrate fossils found near Shakespeare, New Mexico.

Daniel M. White presented a gray and white spotted deer skin, from near Port Townsend, W. T. It was discovered that the deer on an island off the coast are all white like Albinos, and this one was the offspring of one of these white deer which had reached the coast and united with the well-known gray deer. Prof. Davidson who had lived in the vicinity hardly believed the story of the island with white deer, since all the islands were close together, and the deer move from one to another frequently. Moreover, this island would be visited by hunters who would soon depopulate it. Mr. D. J. Staples, had, while coming overland, seen five white deer in a band.

S. B. Christie presented a mammoth cave fungi found in Napa county. W. J. Fisher presented specimens of fine micaceous granite, and four pieces of rock containing sulphuret of iron from Kodiak island, Alaska; also, a fine specimen of native amber, from Sutkum, Alaska.

Mr. J. B. Clifford sent a specimen of insect pest, and said: Having discovered a pest which infests artificial flowers and feathers, in making of which paste has been employed, I ask you to determine its name and habits. The insects are very small, brown, and bore into the goods. They must be French insects or natives of Europe, as they have never attacked American made goods. They are rather expensive boarders, and besides cost 60% duty. Do you know of a remedy?

This matter was referred to Dr, Behr, who will examine the insect.

J. G. Lemmon read a paper on a new species of buttercup from Arizona, and also made some remarks about the naming of new species on this coast, to which we will refer in a future number.

Mr. Edgar Mills was proposed for life membership, and C. Mitchell Grant as a resident member.

The committee appointed to nominate the "regular ticket" to be voted for at the coming annual election, renominated all the old officers and truetees, saying: "After diligent inquiry, your committee find that all the gentlemen named have, in their several places, and likewise in ther personal devotion to the interests of the Academy, rendered it important services. Observing, therefore, the rule of fitness and just recognition of fidelity, your committee commend them for re-election."

News in Brief.

JOHN P. JONES has been chosen a Director of the United Globe Electric Light Co., New York.

DR. ISAAC I. HAYES, well known in connection with Arctic exploration, died Saturday in New York.

THE surveyors of the Carson and Colorado railroad have completed their final lines into Candelaria.

A TERRIBLE typhoon is reported from China, one town being entirely destroyed and 3,000 inhabitants killed.

ADMIRAL BIRD, the commander of the *Investigator*, in Sir John Ross' expedition in search of Franklin, is dead.

THE international railroad has been completed to Laredo, Texas, and the Rio Grande will soon be bridged.

DURING the week ending Dec. 17th, standard silver dollars to the number of 448,495 were coined at the United States mints.

THE English Embassador at Constantinople refusee to allow the Turkish authorities to search a British ship for explosives.

THE precautions against fire ordered by the Paris authorities in the Theater Francaise will involve the closing of that theater for a month.

DURING the five months ending November 30th there arrived in this country 291,318 immigrante, against 254,262 for the eame period in 1880.

IT is said Germany does not intend to await the return of Von Schleezer to Rome, but proposes to intrust negotiations at the Vatican to another diplomat.

THE town council of New Tacoma, W. T., has levied a tax of one cent on the dollar on all property within the corporation, to pay the indebtedness incurred by the visitation of the smallpox.

THERE were two important incidente last week connected with Ireland: The suppression of the Land Leaguer Egan, which English opinion approves, and the formation of the Lord Mayor's Committee.

THE Corralitos Water Co., which supplies Watsonville with water, threatene to reduce the pressure in the town maine unless the town will pay them $150 per month—a sum which the citizens consider exorbitant.

ENGLISH papers announce the birth of a son on the 17th ult. to Lady Hesketh, at Rufford Hall, Lancasbire, an heir to the baronetcy. San Francisco readers will recognize in Lady Hesketh the daugbter of ex-Senator Sharon,

Patent Agency and Newspaper Offices.

Dewey & Co.'s Patent Agency and the business offices of the Mining and Scientific Press, Pacific Rural Press, Pacific States Watchman, and the Fraternal Record, are now favorably situated at No. 252 Market St. Elevator entrance, *No. 12 Front St., S. F.*

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Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Humboldt and Trinity counties.
D. W. KELLEHER—Merced, Fresno and San Benito.
A. C. KNOX—State of Novada.
EDWARD A. WEED—San Francisco.

Attend to This.

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OFFICE OF THE

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SAN FRANCISCO, DECEMBER 6, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, a Dividend (No. 24) of Twenty-five Cents (25c) per share was declared, payable on THURSDAY, Dec. 15th, 1881, at the office of the Company, room 19, 328 Montgomery street, San Francisco, California. Transfer books will be closed on December 10, 1881, at 3 P. M.

JOSEPH NASH, Sec'y.

ANNUAL MEETING.

THE REGULAR ANNUAL MEETING OF THE

Gould & Curry Silver Mining Company,

Will be held at the office of the Company, Room 69, Nevada Block, No. 309 Montgomery street, San Francisco, California, on MONDAY, the nineteenth day of December, 1881, at the hour of one o'clock, P. M., for the purpose of electing a Board of Trustees to serve during the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Thursday, December 15, 1881, at the hour of 3 P. M.

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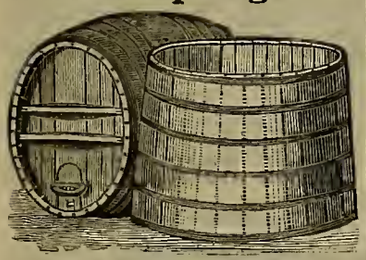

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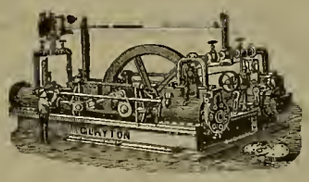

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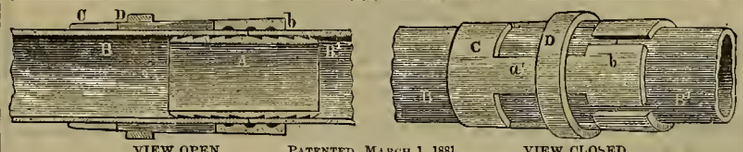

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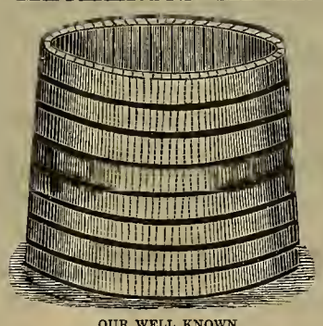

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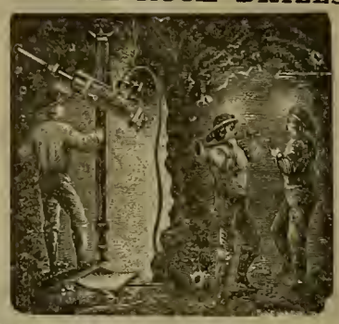

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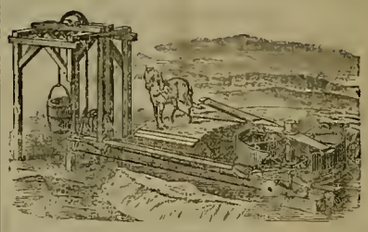

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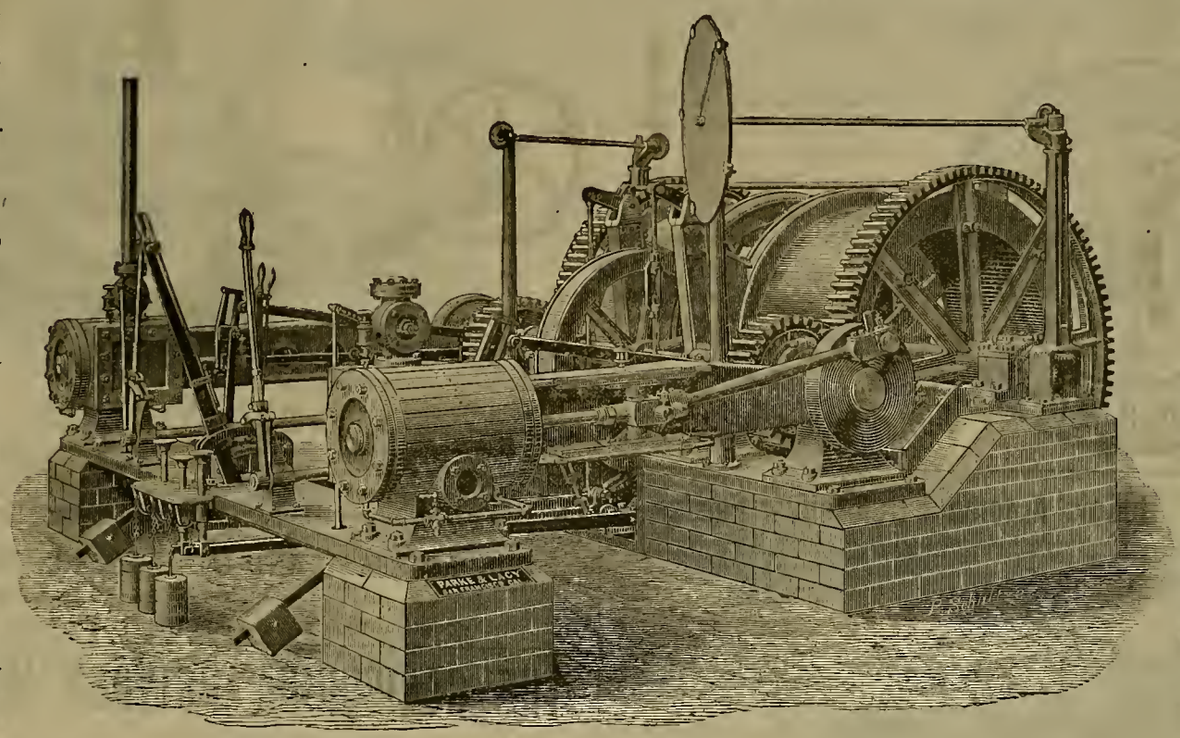

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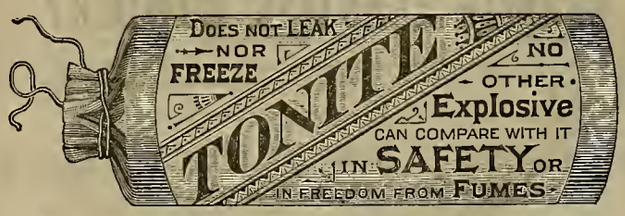

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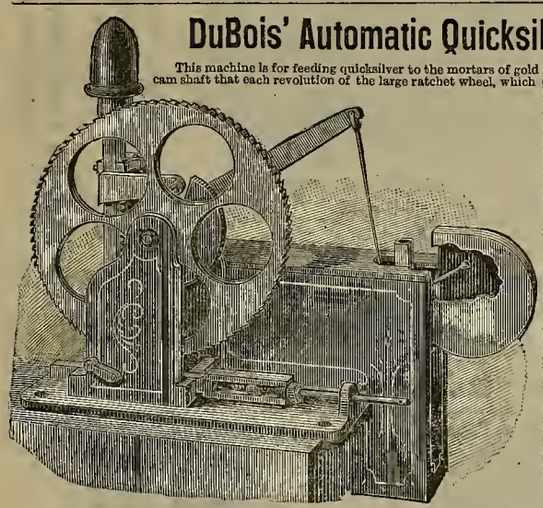

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.

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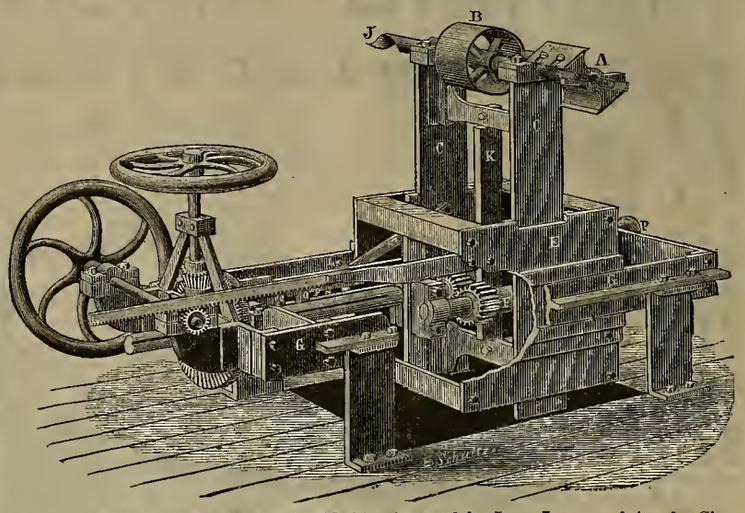

The above cut represents the Framing Machine invented by ISAAC LEPLEY, of Amador City, Cal. For perfection and rapidity of work it has no equal. Any form of cut, tenon, mortise, gain or dovetail in timber of any size can be made with exactness, and as rapidly as desired. It is complete in itself in all its parts, ready for the belt. The machine is simple in construction, and can be run by anyone of ordinary ability. Every mine requiring timber, and all mills where much framing is to be done, should have one, as a matter of economy. It will do the work of twenty men.

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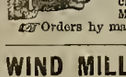

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, DECEMBER 31, 1881.

VOLUME XLIII. Number 27.

The Spring Valley Hydraulic Gold Mine.

The Spring Valley mine at Cherokee, Butte county, heing the largeet hydraulio mine in the State, whioh ie now in active operation, merits notice at this time not only on acoount of the magnitude of its worke, but aleo on account of the great foreeight of ite former ownere in eolving the debrie question ae far ae it affecte thie property.

A sketch of the past history of the property, as well as ite preeent workings and fnture proepects, will probably be intereeting to many readere of the PRESS. For thie we are indebted to the courteey of Mr. G. F. Williams, whoee connection with the mine makee him familiar with all the details.

The mine ie located at the extreme northern end of Table mountain, which forms the firet highland north of the town of Oroville. The problem of bringing an adequate supply of water to the mine wae difficult to eolve, as it wee neceeeery to croee deep river canyons in order to get the water upon the mine with enfficient elevation for hydranlic purpoeee.

Thie work was eucceefully accompliehed in 1870, when a pipe 13,100 ft. in length and 30 inchee in diameter wae laid acroee the weet branch of Feather river throngh a depreeeion of 887 ft. below the diecharging end of the pipe. The receiving end of the pipe hae a perpendicular elevation of 1,067 ft. ahove the hridge upon which the pipe ie laid acroee the river.

The greateet pressure ou thie pipe at the bridge is 384 lbs. per equare inch, or about 18 tone to every running inch of pipe. The main supply of water need at the mine has been obtained from Butte creek eince 1873. It is carried acroee the west branch of Feather river throngh a pipe 3,780 ft. long and 30 inchee in diameter. The perpendicular hight of the diecharging end of the pipe ie 630 ft. above the river. The water ie conveyed thence to Concow reeervoir in a ditch. Thie reeervoir covers 210 acree of lend and has an average depth of 26 ft. The water ie conveyed from the reeervoir through a ditch to the head of the main pipe above mentioned, thenco to the mine.

The average deily amount of water which paeeee through this pipe ie 2,200 miner' inchee, or ahout 37,500,000 gallone. In addition to the above supply, the waterehed in the vicinity of the mine furnishee from 500 to 1,000 inches during the rainy eeaeon. The following figuree will ehow the expendituree of the company from 1870 to 1880:

For ditches, pipes, flumee and reeervoire, $375,820.

For mining ground whicb was originally located and held in emall claime, the sum of $411,113 bas been paid.

The expeneee for mining, including tunneling, eluicee, etc., have been $921,907.

For ranch property, purchaeed to prevent litigation on account of the debris from the mine, the compeny has paid $395,196, and for leveee and other improvemente on eame, $154,708.

In addition to the above amount, the enm of $465,000 hae been paid to the etockholdere in dividende.

The total yield of gold during that period of time (1870 to 1880) hae been $2,650,809. The above figuree are taken from the published report of the Secretary of the compeny, and ehow only the receipte and expendituree of the company before the property chauged hande.

Ahout 18 montha ago the property wae eold to Eastern capitaliete, a considerahle portion of the etock being etill held by residente of thie State.

Under the present adminietration the enm of $19,500 has been expended on ditchee and reservoirs, and $21,400 on levee embankments. The yield of the mine eince changing hande has not heen ae great ae dnring previoue yeare, owing, to a great extent, to the insufficiency of grade to work the best gronnd. The yield hae been about $320,000, which amonnt, witb the exception of $50,000 paid in dividende, hae heen paid out for lahor and improvement, which include the running of a new bedrock tunnel.

The area of mining ground which can be worked by hydranlic procese ie between 200 and 300 acree. During former years only a very small portion of the ground was worked to the bedrock. The geological formation of the deposit ie as follows, commencing at the top:

1. Basalt caprock, covering only a small portion of the hydraulic ground owned hy the company.

2. Pipe c'ay, varying in thickneee from 20 to 200 ft.

3. Fine gravel (mostly quartz gravel), from 100 to 300 ft. deep, carrying considerable fine gold.

4. Yellow, decomposed bowlder stratum, very rich in coarse gold. This stratnm ie from 5 to 15 ft. thick.

5. Blue gravel lying npon the bedrock. Thie etratum is from 10 to 70 ft. thick, and in placee is very rich. It is composed mostly of large howldere. During the former ownerehip the mine was worked down to thie blue gravel or coaree howlder stratum.

Under the preeent management, the blue gravel etratum hae heen worked in eeveral parte of the mine by meane of three large and powerful water derricke. Thie work continuee day and night, the night work being carried on by meane of two electric lighte having 8,000-candle power each.

Ahout a year ago, the company decided to rnn a new tunnel which would be deep enough to work all the hydraulic ground owned hy the company.

Under the eupervieion of the company's engineer, ehafts were enuk npon the gronnd already worked to determine the poeition of the bedrock or deptb of gravel remaining unworked. Three ehafte were eunk and a body of gravel from 50 to 70 ft. deep was developed.

The finding of gravel of eo great a depth, which proved npon teete to be rich in gold, was a snrprise to all intereeted, for the general belief was that the gravel had been waehed nearly to the bedrock.

The bottom gravel in tbe eonth end of the claim, where the shafts were enuk, ie without any undne proportion of bowldere, and can be worked rapidly and oheaply by hydraulic proceee.

The company owne a large area of ground, which ie covered with baealt caprock. It ie the intention to commence drifting thie part of the mine. Thie work will be commenced in tbe near futnre, and will give employment to a large force of men. The nnmber of men now employed ie over 200, no Chinese being employed.

The New Tunnel.

In order, therefore, to be able to work the rich hottom gravel above mentioned, the new tnnnel muet firet be completed.

Thie tunnel will be 100 ft. deeper than preeent workinge. The tunnel was etarted on the 25th of January last. Bnt little work wae done until the 12th of March, when the firet mechine drille were etarted.

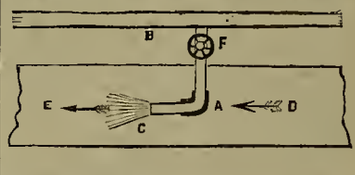
The eize of the tnnnel is 10 by 10 ft. and the total length about 3,000 ft. The grade at the lower end ie 6 in. to 16 ft., and 7 in. to 16 ft. at the upper end. In order to expedite the conetrnctiou of the tunnel it wae determined to eink two ehafte, and run the tunnel from five faces or headinge. The accompanying eketch will show the relative position of ths ehafte, from the compreseors on the eurface to the drills at the headinge. At each ehaft there ie a No. 3 Hooker pnmp driven hy compreseed air. The water which accumulatee in the down grade headinge, ie forced up to the enmp at the ehafte by meane of No. 2 Hooker pumpe.

CANAL FOR CONVEYING MINING DEBRIS.

Ventilation.

The queetion of ventilation ie one of great moment in tunnel work. It wae fonnd that the amount of air forced into the headings by meane of the air compreeeore wae ineufficient to give good ventilation. A eimple and eomewhat novel method of ventilatiou wae adopted, by meane of a half-inch gee pipe, *A*, tapped into the main line of pipe, *B*, leading from the compreesore; a jet of air under a preeeure of 60 or 70 lbs. is let into an 11 in. galvanized iron pipe *DE* (or a wooden air box can be ueed, bnt the friction will be mnch greater), with the outlet *C* of the pipe turned towarde the heading. By opening the valve, *F*, a strong current of air is drawn into the pipe at the end, *D*, and forced to the face of the tunnel.

In thie manner the air at the heading, where all the work ie performed, eoon hecomee clear after blaeting. The principle is similar to that of the Craneton elevator only that air takee the place of water.



Ventilating Appartus for Tunnel.

It ie expected that the tunnel will be completed hy the first of January, the average headway being about 17 ft. a day, and that by the first of March washing will he commenced on the rich hottom etratum which ie now inacceeeible.

The number of men employed on the tunnel work is about 80. Taking into coneideration the number of men employed and the amonnt of giant powder ueed in hlasting, it ie a fact worthy of note that no accident hae happened hy which any one hae been injured.

Debris and Levees.

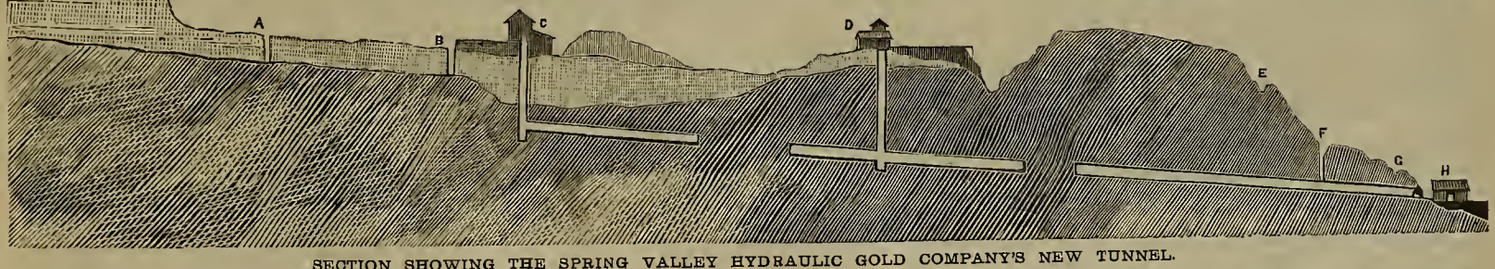
The greater part of the debrie from the river ie retained upon the company's land in the neighborhood of the mill, where the company owne ahout 6,000 acree.

The slickene or eediment held in euspeneion ie carried to the tule lands near the Sacramento river, by means of a leveed canal 400 ft. wide, with euh-levees 20 ft. between hanks. One of the engravinge ehowe the canal and euh-levees.

The object of the sub-levees (ae they are termed), *B*, *B*, ie to etrengthen the main levees *a a*, and at the same time to cauee the wafer to deposit ite eediment hetween the two emhankmente *A*, and *B*, and fill the epace, *D*. This ie accomplished hy putting dams acroes the water course, *D*, so ae to retard the velocity of the water. In this manner nearly all the eediment ie depoeited in the eide canale hefore the water reachee the tule lands. The canal commencee at the Cnnm dam, which is about eix milee from the mine, and extends for a dietance of nearly 30 milee.

During the winter months the canal becomes

[CONTINUED ON PAGE 452.]



SECTION SHOWING THE SPRING VALLEY HYDRAULIC GOLD COMPANY'S NEW TUNNEL.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

The Hydraulic Mining Question.

Another and Practical View of the Case.

EDITORS PRESS:—So much has been said on the hydraulic mining industry in the trials of the several suits growing out of its prosecution, so much written and published in the newspapers and other periodicals of California, that it would seem as if the subject had been exhausted on both sides—and nothing but a reiteration of facts already many times presented was possible. Still with all that has been said and written on the subject, there exists among the great number of those who are unfamiliar with it from personal observation, a misapprehension of some of the most important facts concerning it. Stated in a general way these facts are those showing the absolute and relative value of hydraulic mining to the localities in which it is carried on, and the necessity of its prosecution to those localities. Deducible from the preceding the effect of its permanent stoppage, it has become the rule among the newspapers devoted to the agricultural interests of the State, and also many of the metropolitan journals whose self-imposed function it is to act as whippers-in to public opinion, to decry the importance of the mining industry. It is gravely asserted by them that mining is on the decrease, that the mines are nearly all worked out and those still operated do not pay any profit. Comparisons are instituted between the mining of 20 years ago and that of the present time, which on their face would seem to sustain these assertions. Other comparisons are made between the yield of gold and that of wheat and other agricultural products to show that mining is of the far less relative importance and is becoming more and more so every year. Superficially considered these assertions and comparisons do very well to convince those whose knowledge of mining has been acquired from an intimate acquaintance with the fluctuations of the stock market, and those who know nothing at all but have opposing interests, that mining is of no importance, and that where it happens to conflict with other interests, as for example the agricultural and swamp land reclamation, it should give way to them. The reasoning is quite plausible and might be conclusive if the premises presented were fair and just. But they are not. The mining industry is carried on from an entirely different standpoint and on entirely different principles from agriculture or any other of the great productive industries, and the conditions have been and are so peculiarly anomalous here in California that the comparisons ordinarily instituted are not at all fair to mining. The limits and scope of this article precludes further discussion of this interesting phase of the subject, though it will be indirectly referred to in another connection further on.

By far the greater number of the gravel or placer mines worked by hydraulicing are situated in Plumas, Butte, Sierra, Yuba, Nevada, Placer and El Dorado counties, drained by the Feather, Yuba, Bear and American rivers and their tributaries, and discharging their combined waters through the Sacramento river into the San Francisco bay and thence to the ocean. Some few, comparatively, are situated in Amador, Calaveras, Stanislaus, and Tuolumne counties, drained by the tributaries of the San Joaquin river, and still fewer far to the north in Del Norte, Trinity, Siskiyou, Shasta and Tehama counties, drained by the Klamath and upper Sacramento rivers. Only in the seven first named counties is hydraulic mining of great importance and only in those counties has its prosecution entailed any damage to the agricultural interests of the valley counties.

The purpose of this article is as before stated to present the relative and absolute value of the industry (hydraulic mining), and the necessity of its prosecution to the localities where followed as the principal business, and more particularly the effect of immediate and permanent stoppage. To more clearly and comprehensively show the importance of considering the facts, I have selected one county and shall consider them with reference only to that county. Of the before named seven counties, Placer county ranks fifth in the importance of the hydraulic mining industry. Nevada, Yuba, Sierra and Butte in about the order named exceeding it both in the amount of capital invested and the annual yield. What may be said of hydraulic mining in Placer county applies in the other counties named. Having excellent facilities for obtaining the necessary data in the former I present it as typical of the others.

Placer county is situated in about the middle of the gold mining counties of the State. Its western boundary is in the valley plains about 15 miles from the base of the foothills. From there it extends in a northeasterly and easterly direction, nearly 100 miles to the eastern boundary of the State. In width it varies from 10 to 30 miles. The area is about —— square miles, and the population, by the last census, about 14,200. The northern boundary is in part Bear river, the southern the Middle Fork of the American river, the greater portion of the drainage being into the latter stream through its numerous tributaries. The western portion of the county lying between these two rivers is drained by several small streams, of which Auburn and Doty's ravines and Rock and Coon creeks are the most important. Industrially considered, three main geographical divisions may be made of the county. The extreme western, consisting of the valley plains and extending to the commencement of the foothills, is almost exclusively agricultural, there being no mining carried on, and only one manufacturing enterprise, a pottery, in the division. Grain is the principal production, an excellent quality being raised, though the yield per acre is not large. This portion of the county, comprising about one-seventh of the total area and about one-half the productive arable area, supports three small towns—Rosevills, Lincoln and Sheridan—situated on the line of the Oregon and California railroad. The total population at the present time does not exceed 3,000. The eastern division, comprising nearly one-half the total area of the county, consists of high mountains, deep canyons, beautiful lakes and mountain streams, and is only valuable where the timber is accessible. The permanent population, scattered in a few railroad stations and at sawmills, does not exceed 200 to 300. A few mines are known, but as yet have only been prospected. The central section comprises nearly one-third of the total area, and supports a population of nearly 11,000. The western third of this division, consisting of the lower foothills, up to an elevation of from 1,500 to 1,700 ft., contained rich surface placers, long since worked out and abandoned. A few gravel mines are still worked on a small scale, but are unimportant. The principal mining industry at the present time is the development of the numerous auriferous quartz ledges. These lower foothills, utilizing the water from ditches dug originally for mining, contain many small farms devoted to fruit culture. Hay and stock also figure extensively in the gross product. The eastern third of this division is the region of the great auriferous channel gravel deposits, which are worked by hydraulicing and drifting. Some few quartz mines have been discovered and prospected, but only one, the Rising Sun, at Colfax, has been permanently worked. Between these two sections is the remaining third of this division, poor in both mineral and agricultural resources. The iron mine and smelting furnace at Hotaling is the only important metallurgical enterprise. The comparatively small and scattered population is supported by the cutting of timber for fuel and the raising of hay and stock. As to the distribution of population and industry: In the agricultural and semi-agricultural portion of this division the population is concentrated along the line of the railroad, a certain portion receiving its support from it. The towns are Rocklin, Penryn, Newcastle, Ophir, Auburn, the county seat, and Colfax. Rocklin is a railroad town; Penryn receives its support from the granite quarries; Newcastle is the shipping point for the fruit-growing industry; Auburn and Ophir are in part dependent on quartz mining, as yet in its infancy in this section; and the town of Colfax is a railroad junction and shipping point for mines to the southeast. A population of at least 6,000 is concentrated in these towns, and engaged in mining or agriculture in the immediate vicinity. Of this number probably 1,000 derive all or part of their income from the hydraulic and drift mines higher up in the mountains.

As to the location of the gravel mining industry: Auburn is the distributing point to mines in the southern part of the county, and what is locally known as the Forest Hill Divide, which lies between the Middle Fork of the American river on the south, and the North Fork of the American river and Shirttail canyon on the north. The road from Auburn crossing the North Fork just above its junction with the Middle Fork, and climbing the Divide, runs for 15 miles through a sparsely settled country. The inhabitants find their principal support in the travel over the road. Fifteen miles from Auburn auriferous gravel begins to appear, until Todd's Valley is reached—20 miles from Auburn—but few mines are seen. The deposits worked are comparatively shallow and have been hydraulicked wherever possible. During the winter they still employ a few men. At Todd's Valley are the large hydraulic mines of Pond & Co., employing, when running, directly and indirectly, about 50 men. At Forest Hill, 23 miles from Auburn is one large hydraulic mine, the Dardanelles, employing 60 men. Several drift mines are also worked. At Yankee Jim, three miles north of Forest Hill, the mining is principally by drifting. At Bath, two miles northeast, is the Paragon mine, at present worked by drifting; some hydraulicing has been done. At Michigan Bluff there are several hydralic mines, and in the vicinity of these towns 10 or 15 others of minor importance, and occasionally operated. What is locally known as the Iowa Hill Divide lies between the North Fork of the American river on the north and Shirttail canyon on the south. The only town is Iowa Hill, eight miles southeast of Colfax, around which are many hydraulic and drift mines, the former predominating in importance, both from the capital and labor employed and the gross yield. Around the towns of Dutch Flat, Gold Run and Alta, the former being the second town in this county in point of population, are the largest and most important hydraulic mines in the country. Very little or no drift mining is done. On the Iowa Hill and Forest Hill Divide about three-fifths of the total yield of gold is from the drift mines, the remainder from the hydraulic. The preponderance of the yield of the drift mines is due to the fact that they are worked throughout the entire year, while the working of the hydraulic mines is confined to a water season of from 100 to 125 days. The total population of this portion of the county is nearly 5,000, all of whom are directly or indirectly dependent on the gravel mines. The value of the mining property, that is the mines themselves, the improvements, pipes, sluices, etc., the water ditches and rights, and necessary buildings, at an extremely low appraisement foot up over $1,500,000. The other land and improvements receiving their value indirectly from the presence and operating of the mines, consisting of town property, saw mills, mountain farms, roads, etc., valued equally low amount to at least $500,000.

Consider now the effect of the permanent stoppage of hydraulic mining. Of the $2,000,000 of property just mentioned at least $1,600,000 or four-fifths of the total would be wiped out of existence, the remaining fifth representing the value of the drift mining industry and dependencies. Of 5,000 of population at least 3,500 would find their occupation gone, be compelled to remove elsewhere and seek new occupations. The present hydraulic mines cannot all be worked by drifting as is claimed, the conditions as compared with hydraulic mining being very different.

The towns of Todd's Valley, Iowa Hill, Gold Run, and Dutch Flat would be almost completely depopulated. Forest Hill, Michigan Bluffs and Yankee Jims would lose about 60% of population. Bath, Sunny South and Damascus, all very small places, entirely supported by drift mines, would not be affected. Colfax and Auburn would lose considerable trade, and many of the small farmers in the foothills receiving their principal income from the sale of hay and produce to the miners would be affected.

Briefly summarized the effects on the county would be about as follows: A certain irrecoverable loss of at least one-fourth of the population; a reduction of one-third in the net incomes of another fourth; the practical destruction of $1,500,000 of property and reduction in the value of nearly all property not exclusively agricultural. This, beyond all question, would be the final result of the stoppage of hydraulic mining. Can the county of Placer stand it? And if Placer county, much more favorably situated than her sister mining counties with regard to hydraulic mining, finds these results disastrous in the extreme, what will be the result in them with their far greater vested interests? Because these results do not occur in a day they are none the less certain; 30% of their effects would be felt the first year, 50% the second, and the third year the remainder. Some of these have been felt already, the enforced idleness and uncertainty of the future having a tendency to depress values. The assessment roll shows in Placer county a reduction of nearly half a million in the value of the gravel mining property directly due to these causes.

Becoming more general in the discussion, the testimony in the debris case now on trial at Sacramento, shows the gross product of the hydraulic mines to be from $14,000,000 to $17,000,000 annually. This may fairly be held to represent from $50,000,000 to $70,000,000 of directly invested capital; indirectly there will be as much more invested within, as well as within the mining districts dependent on the industry. Admit that the State can stand the loss of fixed capital represented by the figures given above, and within at the most five years, can it stand the sudden cessation of annual income to the amount of $14,000,000? Does that sum bear so small a ratio to the total income of the State that its loss will not be felt? Only the greatest ignorance of the resources of the State would attempt to sustain such a view. San Francisco and California would beyond all question be seriously crippled by this loss of income. Every industry, with the possible exception of the purely agricultural and even that by sympathy, would suffer great damage.

The figures I have given may be rather more relative than exact, but at any rate are underestimated. The very slight and superficial presentation I have made of the subject is all that is possible within the limits of this article. If it lead to a more thorough and exact examination of the facts I have called attention to, it will have accomplished its object.

RUSSELL L. DUNN.

Auburn, Dec. 19th.

Sawtooth Mines.

EDITORS PRESS:—A few items of interest concerning the mines of this already famous quartz district would be acceptable to your many readers. Sawtooth mining district embraces quite an extensive piece of country, being over 100 miles long by nearly the same broad. The main producing portion of this district is what is known as Smiley and Beaver canyons, both being near each other, in fact adjoining canyons. Smiley is situated about 12 miles from the head of Big Wood River, being divided by a range of high mountains known as the "Wood River Divide." It is at nearly the head of the main Salmon river that Smiley gulch commences to run south and continues for a distance of five miles as a broad open valley with the creek called Smiley in the center. The gulch itself is probably 10 miles long, and becomes narrower as one ascends. When nearly at its head the surrounding mountains come into the shape of a horseshoe, forming what is known as Smiley basin. Here it is that the Mountain King, Vienna, Solace, Emma, Lucre, Hidden Treasure, Wisconsin, Nellie group, Alturas, Justice, and many other rich mines are located. The greatest of these is the Mountain King, owned in Minnesota, and managed by C. J. Johnston; he and his brother, Frank A. Johnston, are largely interested, both in this and the Vienna, another excellent piece of property. The Solace is owned in your city by Haggin & Tevis, and the showing on the surface is certainly a good one for an excellent piece of property when depth is attained. The Emma is owned by L. Smiley, the discoverer of the district, who richly deserves the rich property which he is possessed of. The Nellie group is operated by W. H. Brodhead and owned by New York parties. The Alturas and Justice is in the group known as the Vienna group, both mines having large bodies of good ore awaiting the erection of the company's 40-stamp mill in the spring. The Lucre has a fine surface showing, though of a lower grade, it will on account of the immense quantity, pay to mill, being conveniently situated. The Hidden Treasure and Wisconsin are extensions of the Mountain King, both showing an immense ledge and good ore of perhaps 8 ft. in width. Smiley has in promises to fulfill every expectation of the hardy and persevering men who are trying to bring it out. Not a little of this credit is due to the brothers Chris and Frank Johnston, who in the face of many hardships and at their own expense developed the Vienna, the first mine really opened up enough to show that at 500 ft. the ore was as rich and the bodies as large as on the surface. They have now got their reward in the Mountain King and Vienna group, both having sufficient first-class ore to keep their 40-stamp mill running night and day. Mr. L. Smiley also deserves special mention in this respect. Mr. Smiley is a hard working and energetic miner, as well as a thorough gentleman; to his steady and persevering work is due the opening of his claim to such a depth that proves beyond a doubt that the Emma ranks high among the paying ones of this camp.

The new mining town of Vienna is situated about two miles from the principal mines, and promises fair to be another Virginia City. Some very prominent merchants intend opening up large warehouses in the spring.

At the foot of Beaver canyon, about three miles from the main Salmon river and about two miles from Smiley gulch, lies the town of Sawtooth, in summer numbering a population of about 1,000 people, four good outfitting stores, sight or ten saloons, three restaurants, one butcher shop, one livery stable and a hurdy-house, comprises the business portion. A daily mail arrives and departs, in summer on wheels and winter on runners, carrying passengers and express freight. Two miles above Sawtooth City is situated the first stamp mill erected in the district, being owned by the Columbia and Beaver and Lucky Boy companies, of New York. The mill is a 20 stamp and as fine a structure as can be found in any camp. It was erected by Mr. J. K. Owens of your city—"Jim," certainly ranks high as a mill builder. Comfortable quarters for officers and men are erected. The Secretary, Mr. C. W. Cortright, was here during the erection of the mill, devoting all his time and energy to the promotion of his company's interest. Three miles above the company mill is their mines the Columbia and Beaver. The former is probably the most developed mine in the canyon, exclusive of the "Pilgrim," being opened by three different tunnels, each being some 200 ft. in length, running on the ledge bearing fine bodies of ore for stoping. They have commenced running a fourth tunnel some 500 ft. from the lowest. When this tunnel taps the ledge (it being a cross-cut) it will be as fine a developed piece of property as there is in the district.

The developments on the Columbia and Beaver during the past summer has demonstrated that they are exceedingly valuable mines that will add largely to the bullion output the coming summer. I believe they are at present under the management of Mr. J. R. Gowan, of Utah. The Pilgrim mine owned in California and managed by Mr. J. L. Richardson, is one of the best claims in Beaver gulch, being well developed by shafts and tunnels and proved valuable at 300 ft. depth, the ore there being richer and of larger quantity than on the surface. Probably 1,000 tons of ore await crushing in the spring. The Bidwell and Beaver Extension companies, of New York, have quite an extensive body of ore in their claim. These mines have only been developed this past summer, but so far they promise well. They are managed here by Mr. Gardiner Adams of your city. There are a great many more of good repute, that when the snow clears off work will be resumed. The ores of Sawtooth are the best of milling ores, carrying antimonial silver and black sulphurets and some gold, and require roasting for successful amalgamation. This is a fine mineral country and I am confident that within another year Sawtooth will rank as the leading quartz camp on the coast. "VOXPOPULI."

Sawtooth City, Alturas Co., Idaho, Dec. 13.

INDEPENDENCE, a mining camp west of Denver, has for a long time been overrun with desperate characters, who kept it in a perpetual state of turmoil. Shortly after dark, Friday night, Patton and Malloy, two desperadoes, started up the street, firing revolvere promiscuously. The people turned out *en masse* and pursued the desperadoes, who were finally brought to bay, and literally riddled with bullets.

Mechanical Progress.

Drilling Machines Operated by Electricity.

Mr. J. H. Thomson, of Shoeburyness, England, recently proposed a new method of working drilling machines. He recommends the use of drilling machines operated hy electricity, the drill being contained in a metal frame, in the central part of which are fitted two revolving drill spindles, one within the other, the larger being hollow and the smaller one solid. The small spindle has at its end a shoulder on which a drill or bit is fitted, and prevented from turning on the spindle by means of a feather and slot. Another drill or bit is similarly fitted onto a shoulder on the hollow spindle, and is made hollow to allow of the drill or bit on the small spindle revolving within it. The revolving spindles are driven in opposite directions, each having fixed to it a bevel-toothed wheel, which two wheels gear into, and operated by two bevel pinions, each fixed to a tubular part or sleeve, made so as to revolve on a fixed axis, at right angles to the revolving spindles, such axis passing from side to side of the frame, an aperture through the same being provided for the small drill spindle to work in. To each of the loose tubular parts or sleeves is fixed a disk, to which eight pairs of iron bars are connected. The said bars are wound with insulated wire so as to form electro-magnets. These in turn attract armatures fixed to the frame. The electric current is admitted through a terminal, whence it passes to a contact maker, thence to brushes, and from these latter to insulated rings, each split into eight parts, to correspond to the magnet, and so arranged that only those magnets are in action which are approaching the armatures. From the magnets the electric current passes to another set of insulated rings, and thence by the brushes to a terminal. The connecting wires pass along the frame of the machine. Suitable handles are provided by which the operator may hold and work the machine. If the diameter of the small drill or bit be in the ratio of 794 (or thereabouts) to the diameter of the larger drill or bit, the two drills or bits will counteract each other, and the frame will not have a tendency to turn round. Single drills or bits may, however, be employed when (as in the case of small work) convenient.

Glass Roofing and Siding.

The short-lived nature of the more common materials employed for roofing purposes is so patent that any material approximating a greater degree of perfection, beauty, utility and durability, must meet with general commendation. Glass has been prepared to meet this want, and a manufactory has been started to produce it in large quantity. The manufacturers claim for this roofing not only superior beauty, but also superiority and convenience for all purposes over any other kind of roofing now in use. It is claimed that this roofing is stronger than slate and one-half lighter, that it will not disintegrate or shrink, and that it will not absorb moisture, there being no capillary attraction. The manufacturers also contend that practical tests have amply demonstrated that it is cooler in summer and warmer in winter than any other roofing, its corrugated surface reflecting and radiating the rays of heat. It can be laid on open sheathing or laths, shedding light without exposing objects to men from within or without, or it can be laid on tight sheathing as may be desired. It can be made of any color, variegated or materialized to suit the fancy. The peculiar shape of the shingles produces a wavy appearance, greatly enhancing its beauty, and at the same time providing a bearing for all parts of the shingle. It is fastened to the sheathing as a roofing or on sides of buildings as a siding, with nails made for that purpose, or with screws, the former being preferable. Not a nail or screw is exposed to view from gable to gable, each nail or screw being covered and protected from the elements by the nose or point of the overlapping shingle. A broken shingle can be readily replaced. No cement, putty, or other substance is employed in laying this roofing. Filling may be used between the sheathing and the shingles if desired.

Tinkering.

An unfortunate weakness of some in charge of machinery is a desire to be constantly tinkering at it, under the mistaken impression that they are improving its performance. The reverse is the truth oftener than otherwise. With new engines and machines it sometimes happens that the parts chafe a little through some oversight in fitting up, and require to be eased, but when it comes to resetting valves and general overhauling, though they may be instances where it is required, in most cases it is a mistake to attempt it.

Here and there, perhaps, a little slide valve engine has been set cold, so that when it gets to work hot, the valve does not work properly; but most automatic engines, we might doubtless say all, have been correctly set by the indicator before being sent out of the shop, and no one can correct their performance by merely guessing at what is going on in the cylinder, and assuming that the performance can be improved by shifting the eccentrics hap-hazard.

Engines which require the fewest repairs are those that have had the least tinkering done upon them, and that, as a rule, applies all over. It is the same in the machine shop, some are eternally on bad terms with their lathes or shapers, or planers. We recall one man who was so often upon his knees about his lathe and had so many quarrels with its performance, that he gained a nickname which stood in lieu of his proper one, and after all his fussing with his lead-screw and feed-gear, and cone-pulley, and bearings he did the poorest work in the shop. Perhaps, because he was a tinker.

It is a good thing to know when a machine is in order and to keep it so; in other words, "let well enough alone."—*Ex.*

An Elastic Lacquer.

According to the *English Mechanic*, a patent has been taken out in Germany for a new description of elastic lacquer, which will not peel off, and which is suitable for the coating of carriage-cloths, plans, and other articles to be rolled or folded, as well as for wood and iron-work, walls, etc. It may also be employed as an isolating layer for damp rooms, as a means against dry rot, and in rendering stuffs waterproof.

To produce the lacquer, 50 kg. of linseed-oil varnish are heated up to boiling point. In another vessel about 15 kg. of lime are slaked in 20 kg. of water. As soon as the lime boils, about 50 kg. of hot melted raw caoutchouc are added to the lime water, and the whole is then stirred until it has become thoroughly mixed. This composition is poured into the boiling varnish, the whole being stirred all the time. Further stirring takes place until a homogeneous mass is formed, which is afterward strained or filtered, and left to cool. After cooling, the lacquer has a pap-like consistency. To apply the lacquer it is diluted with the desired quantity of varnish, and put on with brushes, either in a warm or cold state; but it is said to be better to apply it warm, as then no varnish is required for diluting it. In rendering linen water-proof, the lacquer may be put on by means of brushes or rollers. After treatment, the linen or other stuffs, paper, etc., are hung up to dry. Stuffs are perfectly dry and ready for use in two days. The product is stated to be lustrous, elastic, not sticky, and perfectly water proof.

How Electric Wires are Covered.—Prof. A. E. Ayrton has recently devised a novel method of covering wires for electrical purposes, the process being merely a modified form of weaving. The wire, which may be German silver, platinum, silver, etc., or simply copper or iron, if chasmese may be desired, is wound bare on the shuttle and used as the weft, being woven backward and forward between parallel fibers of silk, cotton or any suitable material employed as the warp and the insulating material employed on the shuttle. The web, whether composed of a warp of wires and a weft of insulating material, or a warp of threads of insulating material and a weft of wire, may, if desired, be steeped in or passed through a bath of bitumen or melted paraffine wax or other similar liquid, and an extra security of insulation and solidity is thus secured. It may be rolled or twisted up sideways to be placed in the bath. The web or ribbon, in the flat state as woven, can be easily painted with any fluid compound if desired, an ordinary paint brush being employed for the purpose, or the web or ribbon may be covered with gutta-percha, or with some similar substance, by being passed through a die where the compound is under pressure.

Rapid Melting of Iron.—Mr. Thomas D. West, in regard to the rapid melting of iron, says: In my practice, whenever I wanted to melt rapidly, I always had my pig iron broken small, as pig iron melts at the ends first. If the pigs had too much sand on them, I would have it knocked or brushed off. The fuel should be free from all dirt. Instead of making the charges all the same weight throughout the heat, I would make every other two charges lighter. For instance, starting at 4,000 lbs. for the first charge, the last charge would be, according to the heat, from 2,000 to 1,000 lbs., as a cupola never is in as good condition for melting iron toward the latter end of the heat as at the first. This way of charging brings your fuel and iron closer together. In charging up, the fuel should be laid in loose, so that the flame can get a good chance at it, and the fuel should be put in compactly, so as to make a solid fire. The charges should never be allowed to get below the charging door until all the iron is in. It is also of great importance to use some oyster shells or limestone to clean the iron. The slag and dirt should be let out of the cupola when there is any collected.

A New Electric Light.—Two Frenchmen have recently introduced into Paris a new electric lamp which, because of its mellow luster, they call the "Sunlight." The light is formed by boring two conveying holes into a small brick of marble and inserting two carbon rods which nearly penetrate the brick and are separated at their point by a partition of the marble. Their upper ends are connected to the dynamo-electric machine, and the current in traversing the wall of marble between the points makes it white hot. The gas escapes by the bore holes, which are wider than the rods, while the light is emitted by the bottom of the brick, which becomes calcined.

Scientific Progress.

Some Facts About Comets.

The multiplicity of comets during the past year has attracted an unusual amount of attention and study to this class of celestial objects. Emile Dolaurier advances the hypothesis that the great rapidity of cometary motion causes the ethereal matter to vibrate and transforms it into light and heat. He expands his hypothesis so as to account for all the variations of form which the great comets undergo, for the apparent solar repulsion and for the curvature of the tail.

M. Praxmowski, from observations since 1858 by the spectroscope and polariscope, concludes in regard to

The Constitution of Comets,

That they are formed of a condensed portion, which constitutes the nucleus, surrounded by an incandescent gaseous atmosphere, containing carbon and reflecting solar light, and of a swarm of disaggregated material. This latter is not controlled by the cometary attraction, but moves in obedience to universal attraction. In some comets the polarization of the light is strongly marked, while in others it is almost wholly absent. In the latter case he compares the structure to that of atmospheric clouds.

Thollon has presented to the French Academy an account of some comparative observations upon

The Spectra of the Two Recent Comets,

The continuous spectrum predominating in the first, while in the second the three carbon bands were very well defined and very brilliant, but gradually faded upon the side of the violet, and he was unable to observe any slight traces of a continuous spectrum until the night of the 21st of August. The brilliancy of the head and tail varies rapidly with the distance from the sun. In the absence of any precise photometric measurements, the variations seemed to be nearly in the inverse ratio of the square of the distance. If this law should hold rigorously it would probably follow that the white lights of comets is almost entirely due to reflection of the sunlight. It seems hard to reconcile the slowness with which the brilliancy of the band spectrum varies with the common opinion that the elements of a comet are raised to incandescence by the sun's heat. Comets, like nebulæ, may have some heat and light of their own, independent of that which may come from solar, mechanical and electric action.

Phosphorescent Alumina.—Prof. Crookes has experimented with phosphorescent spectra in a nearly perfect vacuum. After operating for a long time upon chemically pure alumina which had been precipitated from the sulphate, he noticed a curious phenomenon. When the body was first inclosed in the vacuum it was of a snowy whiteness, but after having been exposed frequently to the molecular current, thus producing phosphorescent alumina, it gradually assumed a rosy tint, and after two years, when it was exposed to the solar light, it showed a trace of the aluminum line. Repeated molecular excitement gradually brings the amorphous powder into a crystalline form. If ammonia is added in great excess to a diluted solution of alum, a part of the alumina is precipitated. Separating it by filtration, igniting it and submitting it to the action of the molecular current, instead of giving a red light, it has a pale green phosphorescence, which, when examined with the prism, shows no lines, but simply a concentration of light in the green portion of the spectrum. In studying rubies, of which he examined an enormous number by his apparatus, Crookes had the good fortune to find a single crystal, which, although it presented no difference to the sight, gave a green light under the action of the molecular current. This green light, however, always has a trace of the red line, and if the action of the molecular current was continued for several minutes, the green phosphorescence faded and a red tint was produced.

Explosion of Bubbles.—Plateau has published some new experiments upon thin liquid films. One of the most interesting is one which furnishes conclusive evidence of the contraction which the bubble undergoes during its rapid destruction. He filled with tobacco smoke a bubble of glyceric liquid of about 11 centimeters (4.3 in.) in diameter and laid it upon a ring of 4 centimeters; waiting until the blue color of the summit showed that it was upon the point of bursting he pierced the summit with a metallic wire. The mass of smoke was thrown vertically for about a decimeter above the bubble and then spread horizontally, like an umbrella, and continued to mount more slowly while diffusing itself into air. The experiment was repeated several times with the same result.—*Acad. Royale Belge.*

Large Salt Deposit.—The opinion advanced by geologists on theoretical grounds that an enormous deposit of salt reaches from the Luneburger Heide to the coast of the Baltic, has been established by actual tests. Borings have shown that one branch of the deposit extends from Luneburg, under the Elbe, and across the Grand Duchy of Mecklenburg, and another in the direction of the Duchy of Holstein, by way of Legeberg to Elmeborn. In one place the salt is more than 130 meters thick.

Engraving by Electricity.—Electricity has within late years produced wonderful results in almost all branches of science. One of the latest achievements, successfully introduced by M. Plante, is engraving on glass by means of electricity, the process being as follows: The glass is laid in a horizontal position, and covered with a concentrated solution of nitrate of potash, the liquid being retained by a shallow vessel in which the glass is placed. A platinum wire is dipped in a horizontal position in the solution along the edges of the glass. The wire is attached to one of the poles of a secondary battery of 50 or 60 elements. The lines are traced by hand with the point of an insulated platinum wire connected with the other pole of the battery. The parts of the glass covered with the alkaline solution become engraved when touched with the end of the platinum wire, however rapidly this is moved, the thickness of the lines varying with the thickness of the wire. The current from either pole may be used in the writing wire.

Evidences of a Lunar Atmosphere.—Prof. Alexander brought forward at the last meeting of the National Academy of Sciences, a variety of evidence tending to indicate some envelope, like an atmosphere, for the moon. The evidence was principally drawn from observations during eclipses. The explanations usually offered for the bright band seen around the moon at such times were fully considered, and shown to be inadequate, though good as far as they would apply. The ruddy band of light is much too broad to be the sun's chromosphere. Various experiments proved that it was not a consequence of contrast alone. It was most apparent in those instances where the moon was nearest the earth. It could best be accounted for by supposing an atmosphere to the moon—a thin remnant of ancient nebulosity, comparable to that which accompanies the earth and gives rise to the appearance of the aurora borealis.

A Plan for Producing Rain.—A Capt. Campbell has been advancing a theory according to which rain can be produced whenever and wherever desired, so that a drouth-stricken locality may speedily find relief. He proposes to take a well already dug, and explode in it say 100 kegs of powder. The powder is to be arranged in such a manner that cotton layers or interstices will prevent the whole mass from exploding on the same instant, so that a continuous sheet of fire and confusion will be kept up for some little time, shooting up into the sky for a great distance, and producing such a concussion and condensation of moisture that he thinks a storm center would be soon formed and rain precipitated. He bases his singular theory on the observations he made on the result of the explosion of the Confederate ram at the time of the passage of the Mississippi forts by Farragut's fleet, and on the result of the Chicago fire.

Height of the Atmosphere.—Dr. A. Kerber has estimated the hight of the atmosphere from the phenomena of refraction. By two different methods he obtains hights of 189 and 192.6 kilometers (117.4 and 119.7 miles).—*Wied. Annal.*

In regard to the above the *Journal of the Franklin Institute* remarks: "Some of the observations upon meteors and auroras have led to the conclusion that the atmosphere reaches a hight of more than 500 miles. Laplace's limit of synchronous rotation would allow a possible hight of more than 26,000 miles. The theory of Fresnel and Grove, that the luminiferous æther is only a very tenuous atmosphere, would make the portion which belongs to the earth of the same hight as Laplace's limit."

Electrical Experiment.—The following simple electrical experiment is described in *L' Electricien*:—A small box of pasteboard is closed with a lid of fine glass, on the upper surface of which collodion is applied several times (but not so much as to render the lid opaque). In the box are placed insect forms, made of sponge or cotton. On rubbing the collodion surface with dry fingers in dry weather, the insects move about in a curious manner.

Living and Dead Protoplasm.—O. Loew finds from his investigations that living protoplasm possesses the property, in a high degree, of reducing metals from their solutions, but that this reducing power is lost by death. Hence it may be concluded that the mysterious phenomena of life are connected with peculiar groupings of atoms, possessed of special motions which are analogous to those of the aldehyde group.—*Pfluger's Archive.*

Improvement in Telegraphy.—An exhibition was made at the Paris Exhibition, by John Mackenzie, of an improvement in telegraphy, which promises to become of much importance. By this device it is claimed that any number from 1 to 999 can be automatically signalled on one wire by a single movement of the transmitter, so that on opening the box at the receiving station the number will be found correctly recorded.

Paraffin as an Insulator.—It is well known that paraffin is a good electrical insulator, but its being so soft has prevented its extensive use. Mr. W. J. Henley has so combined it with India rubber that the insulating power is increased without impairing the properties of the rubber.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 8.		Week Ending Dec. 15.		Week Ending Dec. 22.		Week Ending Dec. 29.	
Alpha	3	2½	3	2½	2.95	2.80	2.60	2
Alta	4.30	3¾	4	3.90	4¼	3.85	4.05	3.90
Andes	1.30	1	1.10	1	1.90	85c	85c	80c
Albion	1.95	1.90	1.90	1¼	1.95	1 60	1.60	1¼
Argenta	....	....	....	....	....	....	....	....
Adlenda	....	....	15c	5c	10c	....	....	....
Belcher	2½	1.60	1.90	1.65	1.90	1¼	1.85	1.60
Belmont	40c	35c	35c	....	60c	....	75c	70c
Best & Belcher	9½	7¾	8¾	8½	8¾	7¾	7¾	7½
Bullion	1.30	1.20	1.20	1.15	1.65	1¼	1.40	1.35
Bechtel	45c	25c	20c	....	20c	15c	10o	....
Belle Isle	....	....	....	....	....	....	....	....
Bodie	4¼	3¼	3.10	2.60	3¼	3	2.90	2.60
Benton	80c	70c	70c	65c	80c	70c	70c	65c
Bulwer	3	....	2.85	2½	2¾	....	2.70	2.65
Boston	....	....	40c	....	50c	....	....	....
Black Hawk	5c	....	....	....	....	....	....	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	25c	10c	10c	....	10c	....	5c	....
California	65c	45c	50c	40c	50c	40c	35c	25c
Challenge	70c	50c	70c	60c	60c	5 c	55c	....
Chollar	3¾	1¼	1¾	1.20	1.45	1.30	1.15	1
Confidence	2½	2	2½	2.30	2½	2¼	2.40	2¼
Con Imperial	10c	....	5c	....	10c	....	5c	....
Con Virginia	1.90	1½	1.60	1½	1.60	1.30	1.35	1
Crown Point	1.35	1	1.20	1.05	1¼	1.05	1.10	90c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1¼	1	1.80	1½	1¾	1½	1¾	1.40
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2.90	2.40	3.40	2.35	2¾	2.45	2½	2.15
E. Mt. Diablo	60c	50c	80c	30c	40c	35c	....	....
Eureka Con	15¼	14	13¾	11	14	13	13	11¼
Exchequer	1.10	1	1.05	95c	1.10	1	1	85c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	25c	20c	15c	5c	....	....	....	....
Golden Gate	2½	2.40	2¾	2½	2¾	2.05	2.15	2
Goodshaw	40c	....	25c	....	25c	....	20c	10c
Gould & Curry	6¾	5	5¾	5½	6¼	4¼	4.40	3.60
Hale & Norcross	2.95	2.15	2.45	2.30	2¼	1¾	1.80	1.60
Head Center	....	....	55c	....	50c	....	40c	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	25c	20c	25c	15c	....	....	10c	5c
Justice	75c	60c	70c	60c	75c	65c	75c	60c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	1½	1	1	90c	1	45c	1¼	60c
Kosuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2	....	....	....	....	....	2	....
Martin White	3	....	3	2½	3.05	2½	2½	....
McClinton	....	....	....	....	....	....	....	....
Mono	1.30	90c	80c	70c	90c	60c	60c	....
Mexican	12	9½	11½	10½	9¾	9¾	9¾	8½
Mt. Diablo	6¾	6¼	6¾	6	7	6¼	7	8¾
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	50c	35c	35c	30c	35c	25c	25c	....
New York	5c	....	5c	....	....	....	....	....
Northern Belle	11¼	10½	10¾	9¾	9½	9	8½	....
North Noonday	35c	....	....	....	35c	30c	....	....
Navajo	....	....	15c	....	20c	15c	25c	20c
Occidental	1	....	1	....	....	....	....	....
Ophir	7¾	6	7½	6¾	6¾	6¼	6½	5¾
Original Keystone	....	....	....	....	....	....	....	....
Overman	2.15	1.55	1¾	1.70	1¼	1.30	1.45	1¼
Oro	25c	20c	20c	15c	25c	15c	20c	15c
Paris	....	....	....	....	....	....	....	....
Potosi	1.60	1	1 80	1.10	1¼	1.40	1.40	1.35
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	30c	....	....	....	....	....	....	....
Savage	3¼	2.80	3	2¾	2.90	2	2.05	1¾
Seg Belcher	6¾	6	5	....	55c	....	....	....
Sierra Nevada	11¾	9¾	11¾	10¾	10¾	9	9¾	8¾
Silver Hill	25c	20c	35e	20c	30c	25c	2 c	10c
Silver King	20	19¾	20	19¾	19¼	18¾	19¼	19
Sucoor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	1.45	1	1.35	1.10	1.35	1.10	1.20	1.05
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	5c	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	20c	15c	20c	....	20	....	20c	....
Tioga Con	10c	....	10c	....	....	....	....	....
Tiptop	5¾	....	5	....	....	....	3¾	2¾
Tuscarora	....	....	....	....	....	....	....	....
Union Con	15¾	13¾	18	14¾	16¾	14¾	15	13¾
Utah	8¼	6¾	7¾	7¼	7¼	6¼	....	....
Ward	3.60	3	3.70	3.60	3.60	....	3¼	....
Wales	....	....	....	....	....	....	7?c	....
Yellow Jacket	4¼	3.40	4.15	3¾	4.40	3.60	3¼	3.10

Sales at S. F. Stock Exchange.

Thursday A.M., Dec. 29.

40	Alpha	2.60	
200	Alta	4.05	
50	Andes	.80c	
370	Belcher	1.80@1.85	
15	B & Belcher	.7⅞	
50	Bullion	1.35	
125	Benton	.70c	
145	California	.30@35c	
190	Con Virginia	1.05	
180	Chollar	1.15	
500	Crown Point	.1.10@1.05	
80	Confidence	.2¼@2.30	
80	Exchequer	.85c	
100	Gould & Curry	.3¾	
200	Golden Gate	.2	
330	Hale & Nor	.1.60@1.65	
50	Justice	.65c	
680	Julia	.10c	
175	Mexican	.8¾	
70	Ophir	.5¾	
500	Overman	.1.40@1.45	
730	Potosi	.1.40	
460	Sierra Nevada	.9¼	
200	Scorpion	.1.15	
710	Union	.13¾@13¾	
25	Ward	.3¾	
325	Yellow Jacket	.3¼@3.30	

AFTERNOON SESSION.

250	Albion	1.90	
55	Belcher	.10c	
80	Bulwer	.2.70@2¾	
100	Bodie Tunnel	.1.20	
50	Bechtel	.10c	
110	Day	.2	
200	Eureka Tunnel	.1.90	
140	Goodshaw	.15c	
250	Manhattan	.1¼	
60	Northern Belle	.8	
500	Navajo	.30c	
100	Noonday	.30c	
100	Oro	.15c	
100	Ophir	.3.60	
100	Wales	.50c	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Horn Silver, Dec. 15th, $12,500; Hanauer, 15th, $2,510; Eureka, 15th, $1,310; Horn Silver, 18th, $10,000; Barbee & Walker, 18th, $1,296; Bullionville, 22d, $2,544; Mammoth, 22d, $2,609; Horn Silver, 22d, $25,000; Barbee & Walker, 22, $1,616; Horn Silver, 22d, $10,000; Horn Silver, 24th, $20,000; Golden Chariot, 25th, $9,094; Clearbrook, 25, $2,516; Buffalo, 25th, $10,305; Hananer, 24th, $4,395; Onondaga, 24th, $2,380; Leonore, 24th, $500; Northern Belle, 21st, $19,653; Mack Morris, 24th, $21,000; Silver King, 20th, $20,873; Northern Belle, 16th, $6,059; Christy, 20th, $4,729; Contention, 23d, $12,117; Indian Queen (for November and December), $27,300; Northern Belle, 24th, $6,515; Christy, 24th, $2,324; Star, 24th, $3,192; Northern Belle, 20th, $6,877; Contention, 23d, $17,966; Bodie, 27th, $9,239; Christy, 27th, $2,119.

THE correct list of victims of the Ring Theater fire, Vienna, has been issued by the police. It gives the total number of victims as 794, of whom 144 have been legally identified.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Albion Con M Co	Nevada	9	30 Nov 25	Dec 29	Jan 19	D B Cblsholm	327 Pine st
Alexander M Co	Neavda	1	3 00 Oct 31	Dec 3	Jan 4	A B Cooper	328 Montgomery st
Alta S M Co	Nevada	22	50 Dec 16	Jan 20	Feb 9	W H Watson	302 Montgomery st
Betty O'Neal M Co	Nevada	2	25 Nov 14	Dec 19	Jan 5	R W Heath	318 Pine st
Belmont M Co	Nevada	30	15 Nov 11	Dec 19	Jan 16	J W Pew	310 Pine st
Bodie Con M Co	California	1	60 Dec 6	Jan 14	Feb 13	W H Lent	309 Montgomery st
Bechtel Con M Co	California	8	25 Dec 3	Jan 9	Jan 30	W H Lent	309 Montgomery st
Black Hawk G M Co	California	13	10 Nov 9	Dec 17	Jan 4	H A Charles	419 California st
Caledonia S M Co	Nevada	38	25 Dec 6	Jan 7	Jan 26	E Wegener	414 California st
Hals & Norcross M Co	Nevada	72	75 Dec 21	Jan 25	Feb 16	J F Lightner	309 Montgomery st
Holmes M Co	Nevada	3	10 Nov 8	Dec 12	Jan 3	E A Holmes	318 Pine st
Kentuck M Co	Nevada	17	30 Nov 23	Jan 3	Jan 23	J W Pew	310 Pine st
Lady Bryan S M Co	Nevada	6	25 Dec 5	Jan 10	Jan 23	C V D Hubbard	310 Pine st
Mono G M Co	California	15	50 Dec 5	Jan 10	Jan 31	W H Lent	309 Montgomery st
Navajo M Co	Nevada	15	15 Dec 3	Jan 17	Feb 8	J W Pew	310 Pine st
Nor h Standard G & S M Co	Cal	2	10 Nov 30	Jan 3	Jan 21	C V D Hubbard	310 Pine st
Original Keystone S M Co	Nevada	6	50 Dec 8	Jan 12	Feb 4	F E Luty	330 Pine st
Oro M Co	California	10	10 Nov 16	Dec 17	Jan 4	W Stuart	320 Sansome st
Pinal Con M Co	Arizona	1	25 Nov 19	Dec 27	Jan 16	W W Traylor	309 Montgomery st
Potosi M Co	Nevada	7	50 Nov 11	Dec 14	Jan 4	W E Dean	309 Montgomery st
Seg Belcher M Co	Nevada	20	1 00 Dec 6	Jan 6	Jan 25	G D Edwards	414 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	4	03 Dec 27	Jan 30	Feb 17	J M Buffington	309 California
Buckeye M Co	California	4	50 Nov 10	Dec 19	Jan 19	W H Lovden	213 Sansome st
El Dorado W & M Co	California	19	75 Nov 12	Dec 22	Jan 16	R M Welch	524 Sacramento st
Horseshoe M Co	Arizona	1	02 Nov 30	Jan 4	Jan 23	J H Sayre	330 Pine st
Iowa M Co	Nevada	15	05 Nov 9	Dec 17	Jan 5	C C Leavett	411½ California st
McElroy Gray M Co	California	6	10 Dec 20	Jan 24	Feb 11	L Lillie	607 Washington st
Santa Anita M & M Co	California	2	02 Dec 14	Jan 16	Feb 2	J B Tivis	24 Kearnyist
University G M Co	California	10	10 Dec 13	Jan 19	Feb 8	W L Oliver	328 Montgomery st
Wide Awake Prospecting &M Co	Arizona	15	10 Dec 6	Jan 12	Jan 30	C Hillebrandt	Chronicle building

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Argenta M Co	Nevada	E M Hall	327 Pine st	Annual	Jan 9
Bullion M Co	Nevada	J M Brazell	328 Montgomery st	Annual	Jan 12
California M Co	Nevada	C P Gordon	309 Montgomery st	Annual	Jan 18
Con Virginia M Co	Nevada	A W Havens	309 Montgomery st	Annual	Jan 12
Hillside M & M Co	Nevada	F Frankenthal	330 Pine st	Annual	Jan 13
Iowa M Co	California	C C Leavitt	411½ California st	Annual	Jan 20
Independence M Co	California	E M Hall	327 Pine st	Special	Jan 7
Ivanhoe Con Q M Co	——	J Hausmeister	212 Pine st	Stockholders	Jan 2
Kossuth M Co	——	E F Stone	306 Pine st	Stockholders	Jan 16
Maryland Con M Co	California	E P Farnsworth	219 Sansome st	Annual	Jan 6
South Hite G M Co	——	F A Berlin	420 Montgomery st	Annual	Jan 9

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	California	W Letts Oliver	328 Montgomery st	20	Dec 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Jan 12
Father De Smet M Co	Dakota	H Dean	New York	50	Oct 10
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Dec 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Nov 15
Silver King M Co	Arizona	J Nash	315 California st	26	Dec 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Dec 12
Vizina Con M Co	Arizona	J E Haskoll	30 Pine st	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3
Western M Co	California	C S Curtiss	309 Mo atgomery st	75	Dec 22

The Mining Share Market.

There is very little doing in stocks. We are approaching the end of the year, when a large amount of money is withdrawn from speculation to satisfy collections, and another large sum of money has been absorbed in holiday trade. There is no development or prospect of a sudden development on the Comstock to create a speculative fever, and, although many of the mines are doing work at interesting points, the public is not expecting bonanzas.

The Combination pump will be run by hydraulic pressure, beginning next week, with the requisite force supplied by a natural flow of water from a tank on the mountain west of Virginia. It is thought that the change will effect a saving of from $50 to $60 per day.

A diamond drill hole is being run southwest from the west crosscut of the Gould & Curry and Best & Belcher mines to determine what lies in that direction.

At the Yellow Jacket mine they are cutting into very promising ground at several points, but as yet have only found low-grade ore. In the vein 300 ft. east of the Yellow Jacket shaft, the Sutro tunnel folks are finding ore that assays very well.

At the Savage two drill holes have been run up from the 2400 level to tap the bottom of the main incline. Neither appears to have hit the incline, but both are running large streams of water. A survey is being made for a third hole, which will soon be started.

Colorado mines paid $2,776,750 in dividends this far this year, as follows: Bonanza Develop Co., $135,000; Catalpa, $180,000; Chrysolyte, $500,000; Dunkin, $110,000; Evening Star, $425,000; Gem, $3,750; Glass Pendery, $25,000; Hibernia, $150,000; Iron Silver, $400,000; Leadville Co., $20,000; La Plata, $180,000; Morning Star, $50,000; Moore M. S. Co., $36,000; Polonia, $12,000; Robert E. Lee, $50,000; Rohinson Con., $450,000; Silver King, $50,000.

Local dividends (S. F.) for December amounted to $530,250 from mining companies against $608,000 in same month last year.

The dividends for Dec., 1879, amounted to $1,121,333, including $944,500 from the mines. This embraced $540,000 from the California and Consolidated Virginia and $100,800 from the Ophir.

YEAR BOOK OF SAN BENITO COUNTY.—We have received a copy of the Year Book of San Benito Co. for 1882, published by the Hollister *Democrat* and edited by Herr Wagner, a sprightly writer. The publication contains much information about the county, descriptions of its chief agricultural districts, record of local events in Hollister, statistics of leading products of the county. It bears on its face evidence of being a fair statement of the resources and industries of the county, and is no doubt a valuable work, worth thousands of dollars to the future progress of the thrifty section of the State it represents.

THE North Bloomfield and Milton Hydraulic mining companies paid taxes amounting to $15,026 in Nevada county.

Dos Cabezas.

EDITORS PRESS:—A letter from this place, in your issue of Dec. 17th, signed E., mentions my name. Efforts are being made here to make it appear that I am the writer of that letter. Will you please let me say that I did not write it, and I am not responsible for any of its statements. J. D. EMERSLEY.

Dos Cabezas, A. T., Dec. 24, 1881.

WEST POINT, CALAVERAS COUNTY.—Our mining interests were never in such a flourishing condition as they are at the present time. It appears, in almost every case, that as depth is attained the ore is found to be as rich as it was on or near the surface of the ground. 'Tis well known that West Point has been one of the richest quartz districts in the State; that is, so far as the surface diggings have been worked, and we hope in the near future to be able to say the same of the different mines here as depth is attained. There are a few of them that are now being worked, which fully proves them to be permanent quartz ledges, with enough gold in them to pay the capitalist for his investment therein. There are at present 14 of them in good working order. The Champion mine being the deepest heads the list.

MINING AND SCIENTIFIC PRESS.—The most valuable of all mining journals came to hand last evening much enlarged and improved in other respects. This number (Dec. 17) contains 21 pages of solid reading matter, with numerous fine illustrations, independent of the large amount of advertising. On the second page is an article from the pen of Geo. Madeira, entitled "From San Francisco to Tombstone." This is one of a series descriptive of Arizona that are to appear from week to week until the entire mining fields of Arizona are covered. In its mining summary is an epitome of our mining report of Dec. 11, as also notes from the various districts in the territory. This is a journal that no miner who desires to keep posted in all the fields of the Pacific coast should be without.—*Tombstone Epitaph.*

MILL AND MINE MACHINERY. — The well known manufacturers of improved and approved form of mill and mining machinery, Fraser & Chalmers of Chicago, Ill., have this week changed the advertisement that has been running so long in our columns, to a more comprehensive one, giving a list of the articles they make. Messrs. Fraser & Chalmers have opened a branch office at Room 32, Wall street, New York, with Walter McDermot as Manager. This firm is now prepared to take contracts for mining machinery or metallurgical appliances of any kind or size, being fully outfitted by extensive additions to shop and machinery.

JAS. C. FLOOD, the mining capitalist, gave his usual Christmas subscription of $6,000, divided as follows: Protestant orphan asylum, $1,000; Catholic orphan asylum, $1,000; Hebrew orphan asylum, $1,000; Ladies Protection and Relief Society, $1,000; San Rafael orphan boys, $1,000; Magdalen asylum, $500; San Francisco Benevolent Association, $250; Boys' and Girls' Aid Society, $250.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

GRAVEL.—*Monitor-Argus*, Dec. 26: The Alpine gravel claim miners are making good progress in the construction of their ditch. We are informed that already nearly a mile in length is finished.

BUTTE.

RED HILL.—Oroville *Mercury*, Dec. 23: We learn that this Co., whose property is situated upon the west branch of the Feather river, near Magalla, in this county, have just commenced piping. They have had during the past summer, a large force of men at work, and by an expenditure of $30,000, put in dams, flumes, giants, pipes, buildings, etc. They have also built dams for impounding all their debris within a few hundred ft of their claim, though, as we are informed, the nature of their ground is such that, taken in connection with their facilities for impounding debris, the water flowing over the dam will be almost, if not entirely, free from sediment. This is one of the oldest claims in the county, its location dating back to 1852, and since that time has been worked more or less, but only on a small scale. Now modern appliances are at work, under the direction of experienced miners, and we expect to see a creditable amount added to the already large yearly gold product of Butte county from the Red Hill Hydraulic Mining and Water Co.

CALAVERAS.

HYDRAULIC.—*Mountain Echo*, Dec. 20: The hydraulic spoken of in a recent issue of the *Echo*, as being nearly completed, is now in full operation. It is situated on Smith's Flat, about 2 miles west of Angels. The company made a run of a few days in order to prospect the ground, and a gentleman who saw them cleaning up, informs us that the claim is very rich. He saw 1 piece of gold which he should judge to weigh about 6 ounces, besides numerous smaller pieces. The mine was located many years ago, and has from time to time produced enormous quantities of gold.

WEST POINT.—Calaveras *Chronicle*, Dec. 24: Work in the Champion mine is progressing favorably. The owners are sinking their winze on the 700 level, and the mill is kept running night and day. The owners of the Lone Star are sinking a working shaft on that vein from the surface, and are taking out some splendid quartz while going down. The owners of the Florida have struck some fine specimen rock in the south drift of 190 level. They intend sinking the main shaft 200 ft deeper when fair weather returns. The Pride of Bummerville mine is running night and day, sinking their main shaft on good quartz; the water is very strong in this mine. The owners, Smith & Co, intend to sink till hard ground is struck. The present depth of the shaft is 70 ft, which at least will give them 40 ft stope on first-class rock. The old French lode will commence to turn out its metal shortly under the supervision of Mr. J. Gouldson. The owners of the Bismarck mine are taking out good rock. Mr. Carey has gone below for machinery for the Star of the West mine, which is the north extension of the old Zacatero mine. Messrs. Rose & Jenkins are erecting a mill on the old Henry lode. Brown & Co. are taking out rich rock from the Whisky lode. The Woodhouse mine is again to be put in running order under the supervision of Mr. Desmond. Mr. W. Steger & Co. are taking rich rock from the Anna mine, the south extension of the Lone Star; 30 tons of quartz on dumps with plenty more in the mine. Work on the Riverside mine is being steadily pushed forward. Mr. Bushman is still running the main tunnel of the Bull Frog mine with plenty of rich quartz in sight. About 12 tons of first-class ore on dumps. Our mills are all kept busy grinding quartz. 'Tis hard to get returns from them all. I have only received returns from 5 of the mines, namely, bullion shipments: Bowers mine, $150; Anna mine, $700; Whisky lode, $325; Sacramento mine, $352; Florida mine, $425; Placer mines, $732. Total, $2,684.

LAMPHEAR MINE.—A number of visitors from Stockton—parties interested in the Lamphear quartz mine near this place—were here this week inspecting the mine. They were Messrs. James Garwood, J. L. Mowbray, J. Jones and son, Mrs. Major J. A. Sheppard, Mr. H. C. Willis and wife, and Mr. Lovelace and wife. We understand that the parties were very well pleased with the appearance of the mine. The hoisting works are being put up rapidly, a number of teams are engaged in hauling the necessary material on the ground, and it is calculated that the works will be ready to commence operations by the latter part of next week.

EL DORADO.

SOLD.—Georgetown *Gazette*, Dec. 23: Jako Urey has sold his Mameluke quartz mine to T. Lehouf of this place. Mr. Urey has worked this seam mine continually for 5 years. He has, however, leased the mine and will work it as usual.

NEW MINE.—Messrs. Peck and Grant of Shasta and Trinity counties, two experienced quartz miners of whom we spoke a few weeks since as coming over to look into our quartz prospects, have already found a new mine in which they have obtained a half interest, a few miles above town. They are very much pleased with the lode, which prospects well wherever they have made tests for a distance of 2,000 ft. They have commenced active work in the development of the mine. They feel confident that they have got hold of one of the best mines in the State.

INYO.

THE KEYNOT.—Inyo *Independent*, Dec. 22: From points culled from private letters it may be safely stated that the Keynot mining transfer will shortly be accomplished.

WAUCOBA.—Mr. W. L. Fuller has received orders on Monday last to take a force of men and commence active operations at once upon the Waucoba district series of mines, belonging to the Waucoba M. Co. of New York. Mr. Fuller has been here some time awaiting the above order, which for some reason has been held back longer than he expected.

RUNNING.—The Modock furnaces at Lookout are in active operation, under the management of Supt. Thomas, putting out bullion worth from $600 to $700 per ton.

AT WORK.—Supt A Wingard arrived from San Francisco last week, and has put a force of men at work on the Green Monster mine, across the river from this place. It is not merely "assessment work," as the mine was patented some years ago, and some important developments may be looked for.

MARIPOSA.

NO. NINE.—Mariposa *Herald*, Dec. 24: This mine, owned by Huling's & Son, and under the name of the Yosemite Co., is running prosperously. The mill, which is of 30 stamps, crushes about 4 tons of rock per 24 hours. Fifty-five men are employed and take out ore enough to supply the mill. The rock pays from $6 to $8 per ton. It costs $4 per ton to take the ore out of the mine and extract the metal, leaving from $2 to $4 per ton profit exclusive of the wear of machinery. The men of families who worked at the Washington have been employed at the No. 9, and have moved their houses from the former to the latter place.

MT. GAINS.—This mine, owned by E. Marcot and others, has been taken in charge by Mr. Hulings, of the Yosemite Co., and 10 men will soon be at work there. Mr. Hulings is to put $4,000 worth of machinery and labor on the mine and after testing the ore, is to have the option of buying it for $4,000. In case he does not buy, the improvements are to belong to the present owner. The plan now is to sink a shaft about 250 ft. deep to the vein. The result is likely to show sufficient inducements to cause Mr. Hulings to make the purchase.

WASHINGTON.—The mill at this mine will run for 3

months yet, crushing ore which is now being removed from the pillars in the mine. The machinery will eventually be sold out or shipped below. Some of it has already been shipped. The desire to sell the machinery furnishes an excellent opportunity for those desiring to develop mines to invest in an outfit.

EUREKA.—Work has been progressing on the Eureka mine under the direction of a Mr. Morris. He is fitting up the Campodonico mill preparatory to making a test of the ore from the Eureka.

POOL MINE.—Hon. D. M. Pool has 2 men at work on his mine. The ore recently taken out appears well and gives promise of a rich development. From a Coulterville correspondence dated Dec. 17, 1881, we learn that the Brooklyn mine is progressing finely. Tunnel in 170, with favorable indications. The machinery of the Mariposa mills and M. Co., for the Reed Talc mine is partly on the ground and the prospects are that everything will be in working order inside of 3 weeks. W. H. Swaine, of Cockade gulch, was in town last Saturday. He informs us that, while out hunting deer one day last week, he accidentally stumbled over a piece of gold that weighed $105. Swaine is one of the most lucky miners in the county. The new air compressor now used in connection with the Hite mine, continues to work finely. The power is taken from the river a mile distant from the mine. One of the drilling machines run by these compressors can do as much work as 10 men.

NEVADA.

THE PROVIDENCE MINE.—Nevada *Transcript*, Dec. 26: The 40-stamp mill at the Providence mine is in operation night and day, crushing 100 tons of ore every 24 hours. The new arrangement by which water is brought from the Snow Mountain ditch through 1,000 ft of 22-inch pipe works to a charm. It is believed that 90 inches of water, or 10 inches less than is now being used, will furnish sufficient motive power, the fall being nearly 400 ft. In the spring the owners of the Providence will double their present crushing capacity by building another 40-stamp mill.

PAYING WELL.—The Gold Flat Eureka quartz mine, upon which work was begun a few months since by a company of Nevada City and Grass Valley gentlemen, with John Trenberth as superintendent, is making a good record for itself. Eighteen tons of ore just crushed yielded $979 in free gold and about $100 worth of sulphurets. The ledge is a ft wide, and the 0 men employed take out about three tons a day.

PLACER.

EUREKA.—Placer *Argus*, Dec. 24: The Eureka drift gravel mining company is the name of a new mine located in east El Dorado canyon, near Damascus. The stockholders are chiefly San Francisco capitalists who incorporated the company on the 12th of October last. The superintendent is Mr. F. Cheppellet, of the Mayflower mine, Forest Hill. Work is being pushed rapidly and satisfactorily on the claim, we understand, a bedrock tunnel, some 150 ft in length, having already been run, besides which a boarding-house (for the accommodation of the miners) and a blacksmith shop have been built. A road has also been constructed from the mine to Damascus, 3 miles distant. The prospects of the claim are considered very good, since every pan of earth taken out between the rock and the loam show pay colors.

PLUMAS.

CARIBOO MINES.—Plumas *National*, Dec. 24: A friend writing from the North Fork country, gives us the following news: The boys are all alive and well at the old camp, and most of them doing a land office business in the way of washing up. J. H. Thompson's claim is panning out big, all the way from $20 to $175 per day. Peck & Mather's claims are paying better than ever, and are proving a big bonanza to the lucky owners. Grton & Keep are driving ahead their main tunnel, with good prospects of striking the pay-grit soon. Wilson & Moore are making good big wages, with lots of good ground in front of them.

SHASTA.

IGO.—*Courier*, Dec. 24: Curtis Downer, now with Dunham & Leiter at Igo, was in town Sunday. He represents everything as flourishing in his locality, and says the mining outlook in that part of the county is of the most encouraging character, both as to quartz and gravel mines.

GRR.—Charles Johnson is engaged in hauling ore from the White Oak mine at Lower Springs to Waugh's arastra. When we see loads of ore passing through town the inquiry presents itself: Why do not some of our capitalists who have the prosperity of the town at heart, erect a good custom quartz mill and ore smelter here? Shasta is the center of one of the richest mineral districts in the State and such a mill would pay.

SIERRA.

MORE GRAVEL.—The Ruby M. Co., at Carriboo ravine, have been prospecting east and west from near the top of shaft No. 2. In the tunnel running west, between shaft 1 and 2, some gravel has been found, but so far as we can learn no prospect has yet been found. The 2 shafts are 400 ft apart, and this deposit lies between them, at a hight of some 60 ft above the main tunnel, which passes under it. No work is being done in the main tunnel at present. R. Davidson and Henry Morse, of Eureka, called on us the other day and report times rather dull just now in that noted mining camp.

EXTENSION.—One hundred and seventeen ounces was the yield of the Bald Mountain extension last week. The face of the main tunnel is in bedrock, and what is presumed to be the north rim of the pay channel. The main tunnel is now being turned east up the ridge, where in the breasts from the incline gang-ways are paying en ounce per day to the pick.

IN the Haskel Peak Gravel mine, three-quarters of what is taken out of the main tunnel (now 60 ft above bedrock) is washed quartz. We hope the persevering and energetic stockholders will soon make a lucky strike.

A PAYING MINE.—The Bald Mountain M. Co. last Saturday cleaned up, after one week s washing, 339 ounces of gold, which is worth over $0,305. This amount does not include all of the gold washed out, as only a portion of the sluices were cleaned up.

TUOLUMNE.

ANOTHER BIG STRIKE.—*Independent*, Dec. 24: We record this week another big strike by a party of miners, on the Divoli bonanza vein, in a northcesterly direction, and about half a mile distant from the Divoli shaft. One day the present week the prospectors brought to town a sack containing about 60 lbs., nearly all gold. The vein at this point, not being developed, it is impossible to tell the extent of their good fortune.

NEVADA.

WASHOE DISTRICT.

OPHIR.—*Enterprise*, Dec. 25: During the week 202 tons of ore were extracted from the croppings and 613 tons sent to the mills. The assays have not been received from the mills.

SIERRA NEVADA.—The chamber for the winze in crosscut No. 2, on the 2500 level, is about completed. On the 2700 level are cutting out a drain and timbering up the joint Union Con. drift. In the joint Union Con. winze are cutting out a tank pit at the 2800 level.

UNION SHAFT.—Are still repairing the drift running out to the Sutro tunnel on the 1600 level, casing timbers at and in the shaft and cutting out e hoh pit at the 2600 station.

CON. VIRGINIA.—Still clearing out and repairing drifts and winzes on the 1600 and 1700 levels, connecting with the old Con. Virginia shaft. On the 2500 level the joint California has been sunk and timbered 12 ft.

CALIFORNIA.—Are still cleaning out and repairing the drifts and winzes connecting with the old Con. Virginia shaft. On the 2500 level the joint Con Virginia winze was sunk and timbered 12 ft. On the 2700 level the joint Ophir east crosscut has been advanced 28 ft.

YELLOW JACKET.—During the past week, on the 228 level, the east crosscut from the south drift was extended 34 ft, making present length of same 76 ft; ground showing an increase of quartz giving low assays. On the 3000 level the east cross-drift is in from switch 332 ft, having made 40 ft during the week; face of same in porphyry with stringers of quartz and slight seepage of water. At a point 278 ft south of the same switch have started an east cross-drift, which is to-day in 35 ft, with ths face in dry porphyry.

CANDELARIA DISTRICT.

MOUNT DIABLO.—*True Fissure*, Dec. 24: There is but little change below the third level. The east drift from winze No. 3 is in 62 ft, and the ground is more favorable for ore. The east drift shows considerable improvement, the ground being of the same character as in the east drift on the next level below. There is a good prospect at this point, the samples of ore assaying $87.

NORTHERN BELLE.—During the week no addition has been made to the length of the west drift in the fourth shaft level, but near the face of the drift a crosscut has been started toward the north and is now in a distance of 12 ft, 8 ft of which are in low-grade ore, showing streaks assaying $100 and upwards. The average daily yield of ore from the mine has been about 61 tons. Bullion shipments for the week ending Dec. 21st, $19,053.23. Shipments on December account to Dec. 21st, $48,072.00.

LUCKY HILL.—The northeast drift has been advanced 83 ft and is now in vein matter of favorable appearance.

PRINCESS.—The work of getting the machinery into place has progressed very rapidly this week, and the wood work is fast approaching completion.

GALENA DISTRICT.

SALE OF MINING PROPERTY.—Lander *Free Press*: Capt. Dahlgren has succeeded in disposing of the Piumas and Goodwin mines at Galena, to an English company. The price received is not stated. These two claims are situated about one mile east of the town of Galena, and are very promising gold mines. A force of 10 men was put on last Monday to set things in shape for a thorough working of both claims the coming spring and summer. Capt Dahlgren will be the manager, with Lou Crunnagle as assistant.

GRANTSVILLE DISTRICT.

THE CENTENNIAL MINE.—*Bonanza*, Dec. 20. Work in the Centennial mine is being pushed vigorously under the formanship of Thomas K. Murphy, with the most encouraging results. Ore of a very good grade is being encountered which may develop into a bonanza at any moment, and if indications don't lie the prospects are extremely flattering.

ESMERALDA DISTRICT.

CORTEZ MINE.—Esmeralda *Herald*, Dec. 24: The main force is now employed in making the connection between the bottom of the incline and the point where the lower tunnel taps the ledge, and rapid progress is being made. Everywhere in the mine ore abounds, and is of good quality. We do not exaggerate when we remark there are millions in sight.

EUREKA DISTRICT.

CORLISS.—*Sentinel*, Dec 25: This mine has lately been visited by experienced mining men and pronounced by them one of the best prospects for an extensive and valuable mine on Prospect mountain. It is situated on the west side of the mountain and south of the Prospect mountain tunnel. There is now a small force of men at work, and as soon as the road is completed, which now reaches near the mine, the working force will be increased. This mine is owned by Senator Doolin, who is now in New York city on mining interests connected with this district. There is now quite a large amount of ore on the dump awaiting shipment.

SAFFORD DISTRICT.

GOOA.—Eureka *Sentinel*, Dec. 25: From O. H Smith, who came up to Eureka last night to spend the remainder of the winter here, the *Sentinel* gets the gratifying intelligence that the Onondaga people have received the returns from 32 tons of ore sent from their mine to Salt Lake for reduction. It averaged between $113 and $119. This clean-up of ore so cheaply obtained, $3,782, is the best thing ever yet heard from Safford. Everybody was paid off yesterday. Things are quiet in the camp. Three men are at work in the Onondaga, and there are about 30 men prospecting in the district.

SOUTH MOUNTAIN DISTRICT.

BULLION.—*Silver State*, Dec. 20: One of Peter Rask's teams arrived here yesterday, with 20 bars of base bullion from South Mountain. The bars average about 90 lbs each, and are said to contain about $30 each in silver, making the load worth about $6,000. They are marked South Mountain C. M. Co., and are the first that have been smelted since the furnaces started, about three weeks ago. Another load of bullion is on the way here on Harry Watson's team, and more teams have gone to the furnaces to load.

WASHINGTON DISTRICT.

THE DELONG MINE.—Grantsville *Bonanza*, Dec. 20: A J. Franklin has shipped several tons of ore from the De Long mine in Washington district to Salt Lake for reduction. The ore is very rich and will certainly give handsome returns. The mine is considered by all who have seen it one of the most valuable properties in Western Nye. Mr. Franklin has recently purchased an interest in it from Cherles DeLong.

ARIZONA.

COPPER QUEEN NOT SOLD.—*Epitaph*, Dec. 22: We are indebted to Mr. Arthur Laing for the full particulers of the reported sale of the Copper Queen mine. It appears that Mr. L. Zeckendorf, one of the owners, had written to parties in London about the mine, and had set a price upon the stock, which was $8 per share, or $2,000,000 for the property. These gentlemen sent out P. Taylor, Esq., of the firm of John Taylor & Sons, London, and Mr. Thom, a celebrated mining engineer, to examine the mine and make a report upon the same. They were accompanied to Bisbee by Mr. James Douglass, a mining expert of Pennsylvania. They returned from Bisbee last evening and took the down stage for Benson. They made a critical examination of the mine, which was found better than the *Epitaph* report upon the same some time ago, for the reason that a winze has been sunk upon the ore body 15 ft since we were in it, thereby adding that much to that in sight. Ore was selected by Messrs. Taylor and Thom, and a run of 15 tons of ingots made, which was in every way satisfactory. It is not known whether the London parties will take the mine at $8 per share or not. That will be a matter for after consideration.

TURKEY CREEK.—Arizona *Democrat*, Dec. 26: George Sines came in from his mine, the Compton, on Turkey creek. He brought with him about 200 lbs of assorted rock, which he has taken from the mine on assessment work. The ore has been assayed at the Prescott assay office, and shows $977.09 per ton. The Compton is a fine property and is opening up very well. It is on the same lead as the Trinity. McCann is at work on the Capital mine, and is taking out good ore. Henry Ashton is at work on the old Urfer claim, now owned by himself and J. L. Fisher. There is a fine body of ore in sight. There is a tunnel being run in on the Gliver Perry mine. This tunnel is to be run in 200 ft for the purpose of opening up the mine, which is now under bond to Eastern men. Mat. Van Winkle is opening up his claim on the divide near the Centennial mine. Messrs. Brady and Brown are sinking on the Peerless, and are taking out good ore, which they propose to have reduced at the Tuscumbia mill. In a word, this district and Big Bug district is now attracting a great deal of attention on the part of miners and capitalists. Joseph Crane, Esq., has just returned from the Davis mine and reports a fine showing on this old and favorite mine. He also paid a short visit to the Desoris mine and found Burton Foster surveying a tunnel location. The mine is attracting a large camp, and justly so. There is very rich ore in the mine, which is carefully sacked and then lowered into the mine. Mr. Crane says that no person, miner or otherwise, can fail to see that this is a very promising mine in every respect. John Stemmer reports a rich strike in Cherry creek; a gold and silver mine. The ore body is unusually large.

GLOBE NEWS.—*Silver Belt*, Dec. 24: South Pioneer Co. are making adobes to use in putting up their machinery over the new shaft. Ore just brought in from the drift being run north on the vein assays $270 per ton.

THE HOWARD mine is the topic of interest among the miners, who are loud in their praise of the mine. A drift has been run a short distance on the new discovery in bottom of shaft 90 ft deep. The ore is as rich as any produced from the mine. The near future of these two mines is that of dividend paying properties.

THE Mack Morris shipped on December account over $21,000, and will on the 20th inst. ship 9 bars more, making for the month $35,000, and will also ship $5,000 worth of concentrations.

REPSEY.—Mr. E. O. Keunedy and John D. Burgess have just returned from a visit to the new Repsey district, situate a few miles south of Riverside. They bring some nice looking specimens of copper ore, and say the ledges are large and give evidences of permanency. There are but a few prospectors in the district as yet. Those already there have laid out a town site—named the town "Repsey," and the principal thoroughfare "Red Dog Avenue." Outside of the copper ledges, there are in this district, immense ledges giving fair assays from the croppings, in gold and silver, and it is the opinion of those who have visited the camp that thers is a bright future for Repsey district.

TOMBSTONE M. & M. Co.—*Epitaph*, Dec. 24: The Combination mine is looking and yielding well, and the prospect work in this mine is bringing forth good results. Northwest shows as well as at last report. Goodenough is opening out a large body of ore on the 200 level. Stopes on the 160 level, Tough-nut mine, are looking well.

GRAND CENTRAL.—Beginning with the old works, the west crosscut on the 600 level is in 130 ft. Several small veins or stringers of ore have been cut within the last few days that give good assays. On the 500 level they have cut the ledge, having a two-ft vein of rich ore on the foot wall, and one 1 ft thick on the hanging wall, with 6 ft of low-grade ore intervening, thus making the ledge 9 ft wide at this point. Are drifting south on this body to intersect the winze, which will be done this week.

VIZINA.—Running a level east from the summer drift which is in good ore. The main drift is all in high-grade ore. The northeast drift is also yielding high grade ore. Hoisting 25 tons daily. The company has declared its regular monthly dividend of $20,000 with an extra dividend of $20,000 payable in New York on the 3d of January. After paying these dividends of $40,000, the company has a surplus of $100,000, or sufficient for 5 more dividends.

CONTENTION.—Flora Morrison shaft down 65 ft below the 400 level. Drifting on the 300 level still continues.

COPPER QUEEN, BISBEE.—Have sunk a winze 30 ft deep on the ore body from the third level, finding the ore as good es above. The company has declared dividend (No. 7) of 10 cents per share, $25,000, and an extra dividend of like amount, making a total to date of $200,000.

WASHINGTON.—Pinal *Drill*, Dec. 24: A good wagon road has been constructed to this mine, which is situated half a mile due north of the King. The Washington mine was located in 1875. The Washingtoo mine, like the Silver King, has ore from the very surface, in a small, rich streek. Assays as high as $2,500 are frequent, but the ore averages $1 0 a ton.

AMADOR.—Is situated on a parallel vein with the Mount Vlow. The assessment work has just been completed by going 10 ft further into the tunnel, which runs into a large reef of heavy dark sper. It seems to be crowded with talc gouges, seams and veins, indicating a very large ore body beyond. The ore gives good assays. The plan is to run the tunnel in deeper, and then crosscut, in order to find the main vein, as the ledge will become more settled at greeter depth.

SILVER DISTRICT.—Arizona *Sentinel*, Dec. 24: The Black Rock continues to improve. The output of ore is increasing and is of high grade. The vertical shaft on the Lost mine is being sunk as rapidly as possible. Black sulphurets and carbonate ores continue to be found in seams and kidneys.

COLORADO.

THE MANCHESTER LODE.—Georgetown *Courier*, Dec. 22: A good strike was made last week in the Manchester lode, in Spring gulch, about two and a half miles from Idaho springs, of 6 inches of clean copper ore, which assays over $88 in gold, silver and copper to the ton, carrying 37% copper. The lode is an extension of the Bleck lode, on which a valuable strike was made a short time ago, and is owned by the Idaho Springs G. & S. M. Co.

NEW CALCINERS.—Denver *News*, Dec. 23: The Miners' Smelting Co. are adding to their works two new calciners, and are also building a new ore house. Their gold refinery will be ready for work in about three weeks. The office and assay department of the company have been moved to one of the cotteges across the railroad from the works. The company shipped 10 silver bricks from the works Wednesday that were valued at $15,000. The average fineness of the bricks was 9080. Mr. Roberts, for the company, has commenced the erection of concentrating works at Idaho. About 200 tons of ore per day are now being received at the works in Golden.

TWIN LAKES PLACER.—Leadville *Herald:* A statement of the conditions and past operations of the Twin Lakes Con. Placer M. Co. has been issued by Mr. T. F. Van Wagenen, manager. Work has now been suspended for the winter, but will be resumed in the spring. It seems that this is to be one of the large and permanent properties of this section of the country. The yield last season, counting all the ground from the grass roots to bedrock, was about 23 cents to the cubic yard. Only one-sixth was gravel, and the gravel yielded $1 00 to the cubic yard. The property of the company consists of 3,000 acres, nearly all of which has been already patented. For fluming and ditching, besides other improvements, the sum of $7,385 has been expended and nearly $5,000 paid out for surveying and procuring patents. There is territory sufficient to last for many years.

IDAHO.

BUSINESS AT BULLION.—Wood River *Miner*, Dec. 17: Notwithstanding that midwinter is almost upon us, business booms right along in and about Bullion camp. The following mines are being worked and are piling up great heaps of high grade ore on the dumps: The Bullion, Mayflower, Eureka, Idahoan, Homestake, Jay Gould, O. K., Red Elephent, Durango end Mountain View. By the time the snows of winter have disappeared and the earth is covered with a rich, nutritious grass for the stock of incoming freighters there will be an emount of ore on the dumps of the mines of Bullion meny times in excess of what has been on hend any time this year.

NEW STRIKE IN THE IDAHOAN.—News was brought in Thursday night of a new strike in the upper tunnel of the Idehoan, and yesterday several citizens went up to Bullion to ascertain particulars in regard to it. They reported the discovery of an apparently large ledge in the upper tunnel and a little over 200 ft from the entrance. Specimens of the ore brought in show it to be a fine grede of galena. The Eureka mine is on the same mountain opposite the Idahoan, and a number of prospects lately begun on this mountain show traces of mineral everywhere. There is little doubt but that the entire mountain, like that to the southwest of it in which the W. R. G. & S. M. Co.'s properties are located, is full of rich rock.

SOLD.—Wood River *Times*, Dec. 21: Prof. Jenney came in from Salt Lake last week to give directions to the miners at work on the Red Elephant and Durango groups of mines at Bullion, and left after remaining here two deys. From the City of Saints, Prof. Jenney will go to Arizona where he is called to testify in an important miuing suit, and will return here in a few weeks. The mines which Prof. Jenney came here to visit consist of two groups, one of which is situated at each end of the productive mines of Bullion. The Red Elephent group adjoins the O K mine on the northwest; it consists of five claims, all of which are expected to make a good showing in the spring. In the Red Elephant there is already a vein carrying 27 inches of solid galena in sight, and widening depth. The depth attained at the time of the Prof.'s visit was 20 ft, the ore having improved from 80 ounces at the surface to 120 ounces at the bottom. The Durango group adjoins the Ophir on the south, and consists of six promising claims, some of which already give evidence of containing ore. The two groups above-mentioned were purchased about four weeks ago by Prof. Jenney, for R. C. Chambers, of Salt Lake. The price paid is said to have been ridiculously low—the figures stated being less than $15,000 for the claims.

ONTARIO.—Rook's group of mines on the west fork of Wood river (Warm Spring creek), continues to open up satisfactorily. About three weeks ago a big cave of ore was struck in the Ontario, which yielded 150 tons in two weeks, when, there being no room for any more on the dump, the work of extracting it ceased, with ore in sight in all parts of the cavo. The cave was thoroughly sampled, the samples being sent to Supt. Rooks in Salt Lake, where they were assayed. They went from 150 to 174 ounces in silver to the ton, besides 69% in lead. Major Rooks has gone to Boston to spend the winter, with the intention of returning early in the spring.

MONTANA.

THE MOULTON MILL STARTED.—*Inter-Mountain*, Dec. 17: After a short preliminary run last night, 20 of the stamps in the new Moulton mill were dropped on ore this morning. The mammoth engine is running smoothly and noiselessly, and all parts of the mill seem to be in perfect order. Some little adjustment of the stamps is necessary in order to get the proper "splash," and to do this successfully may require several days yet. The mill, however, may be considered fairly in operation, though an occasional stoppage of a few hours may be required before everything can be got in perfect running order. Although, as Mr. Clark states, sufficient ore could be extracted from the Moulton to keep 40 stamps in operation, it is not deemed wise to tax the productive capacity of the property until the levels are more fully opened. Mr. Clark is in favor of working the mine ahead of the mill, not of working every ton of ore as rapidly as it can be extracted. The starting up of the Moulton is an important event in this district.

THE BANNACK MINES SOLD.—*Inter-Mountain*, Dec. 21: A private letter from Bannack says that the sale of the Bannack and Marysville gold quartz lodes has been consummated through the agency of Messrs. Smith & Ostrom to a New York and London Co. These mines have been under bond for some time past and their sale has finally been effected. The mines embrace a group of gold mines located in that district that have yielded an immense amount of gold in the past. These mines have large bedies of low-grade free milling quartz in sight, while the base ores are of a high grade. The mines sold include the Dakota, Madamoiselle and Washington lodes on the north side and the Excelsior, French, Wadams and Bannack lodes on the south side of Crasshopper creek, for the sum of $125,000. The new company, it is understood, propose to erect a large mill for the free ores and will reduce the base ores by the smelting process.

UTAH.

SILVER REEF.—*Miner*, Dec. 17: The weekly visit of our mining reporter along the great silver lodes of the district found a state of cheering activity, at all the principal mines. The extensive ore dumps, which show no depletion from the constant drafts made upon them, are themselves a fair premise to drew conclusions from; but a trip into the subterranean chambers, and a survey of their treasure-laden walls, will justify all reasonable anticipation for the future.

THE BARBEE & WALKER.—The 3d and 4th levels north of this mine are both in high-grade ore, from the stopes, of which the principal mill supply is at present obtained. The judicious manner in which this mine is being worked reflects deserving credit on the management. The mill has had an uninterrupted run during the month, with a fair average product, which the bullion shipment will attest.

THE LEEDS.—An important strike has just been made on the 4th level north in the Jenneas shaft. This is more important as it demonstrates clearly the permanence of the ore bodies in the north workings of the mine. This rich body was encountered 120 ft north from the melt shaft, and at present shows a strong 6-ft vein in the face, with every indication of improvement. The Bonanza and Lemmon shafts continue to supply the mill with an abundance of ore for the stamps. An increased output of bullion is promised for the present month, which will no doubt be further enlarged when the higher grade ores from the Jenaens find their way to the battery.

THE CHRISTY CO.—The various mines of this company continue to be successfully developed, and new and important strikes are reported in several, notably, in the old and reliable Tecumseh. The Maggie keeps up its regular shipments, and is looking well throughout. Contractors on the east level of the Uncle Sam, from bottom of the vertical discovery shaft, have encountered ore of a much better grade than that heretofore found. Among the other properties upon which this company is at present prosecuting work is the Silver Point, Silver Crown, Hillside, Great Western and Northern Light, in all of which good milling ore is being raised in greater or less quantities.

THE STORMONT CO.—In the Buckeye new ground is being opened far in advance of the present requirements, and every precaution taken to provide substantial ore reserves. The extension of the 4th level south continues in the same excellent grade of ore that was reported previously, and is fast nearing the locality—at some 300 ft greater depth—which contained the rich bonanzas that made the Last Chance famous. This ground can be far more economically worked through the main Buckeye shaft than from the old incline of the chance, the machinery of which was inadequate for greater depth.

OTHER PROPERTIES.—Among the numerous claims now receiving attention, and which will come in prominence at an early day, we note the McKelvy, Emily Jane, Gisboro, McMullen, Vanderhilt, Grey Eagle, Mayflower, Romulus, Last Chance, Susan, James Duffin, Toquerville, Bisacker & Gibfried, and others on the east apexes of the Buckeye and White Reefs.

GOLD BASIN.—A recent shipment of 50 lbs. of gold amalgam, valued at $5,000, is reported from the Patterson & Ridenour mill at that place, and everything is represented as being in a prosperous condition.

GRAND GULCH AND COPPER MOUNTAIN.—Active operations continue at these localities, and the shipment of copper ingots occur weekly. Copper is destined to become one of the great industries of southern Utah in the near future, and is now beginning to receive its share of attention.

EL DORADO CANYON.—Favorable reports are received from this district. A syndicate, composed of several of our solid business men, has just procured a lease of the Lincoln Co.'s mill, and will start it up on ores from their property. Mr. James Cronen is resident manager, and is making a success of the enterprise.

Meetings and Elections.

Ophir M. Co., Dec. Trustees—C. L. Weller (President), A. K. P. Harmon (Vice-President), C. H. Fish, J. H. Dohiuson, C. O'Connor, R. H. Follis and George Congdon. C. L. McCoy was re-elected Secretary and W. H. Patton Supt. The bullion product of the mine for the year past was $49,527.18. Of this amount $41 353.39 came from ore taken from the croppings, which evereged $24.36 per ton, the yield being 69½% of the essay value, no allowance being made for moisture.

Guterio M. Co., Dec. 24. Trustees—J. B. Haggin, President; Jos. Clark, Vice-President; Louis T. Haggin, William Willis, J. C. Ball and W. B. Carr, of this city, and R. P. Lounsberg, of New York; Secretary, J. K. Goodrich; Supt. R. C. Chambers; Assistant Secretary and Transfer Agent in New York, H. E. Parsons.

Presidio Railroad. Trustees—A. S. Hallidie, Albert Miller, A. W. Bowman, James Moffitt, Robert Watt, J. G. Kittle, N. J. Brittain.

THE MINING AND SCIENTIFIC PRESS of the 17th inst. is a double number, devoted chiefly to Arizona and New Mexico.—*Pinal Drill.*

A Representative Gold Mine.

Report of the Idaho mine, Nevada county, for the year:

The fifteenth annual meeting of the Idaho mining company was held on the 19th inst., at which the following official reports were received, read and approved.

To the Stockholders of the Idaho Quartz Mining Company—GENTLEMEN: I herewith submit for your consideration my annual report for the year ending December 5th, 1881. During the year now past the business of the company has progressed in a satisfactory manner. The work connected with the company's property has also been kept in as favorable a condition as circumstances would permit; and it is considered that there is fully as much pay ore in sight underground now as there was one year ago; and as was expected the yield has been more satisfactory than it was last year. This also has brought an increase of profits, which have been disbursed to the stockholders by increased monthly dividends.

In several of my reports I have stated that our machinery was of adequate power to do all the work required, but each year seems to require an addition, and while we may congratulate ourselves on the apparent permanenoy of the mine, we should also bear in mind that as we attain greater depth, it brings with it the need of larger and heavier machinery. We have hsen troubled considerably in the past to adjust the pumps for both winter and summer use. In the winter the surface water is very fast, requiring 14-inch pumps to keep it at about eight strokes per minute. This water is caught at the 800-level, and below that point a six-inch pump will answer at any time in the year. In the summer months the 14-inch pumps are too large, and have to be run so slow that the six-inch are too small to do the reqnired work below the 800-level, and in view of this difficulty, and inorder to do away with some of the flat rods it was deemed advisable to erect another engine to connect with the lower pumps and have them entirely independent of the large pumps. This engine is of 20 inch diameter and 48-inch stroke, and all its parts are of sufficient strength to work the engine up to its full capacity. As it is impossible to form an idea of the work this engine may have to do in the future, it was deemed best to make a good job in every particular, and when completed it will he second to none on the coast.

The sump at the 800 station has been enlarged. This was necessary from the fact that if from any cause the large pumps were stopped only a short time, the water ran to the bottom of the mine, and with 6-inch pumps ruuning so slow it required a loug time to pump it out. The sump is now 16 ft. by 14 ft. and 60 ft. long.

The underground workings are all in good condition. The 1100 drift is in 850 ft from the incline. The ledge has been of an average quality and size until recently. It now shows indications of breaking up, and I fear we have about exhausted the pay chute in this drift. The stopes connected with this drift are of good size and of an average quality.

The 1200 level is in 512 ft. from the incline. The ore in the drift is of low-grade all the way from the incline, and it has been broken up badly for the last 100 ft. I think, however, it is only local and that it will form again only a little below the bottom of the drift. It certainly extends only a short distance up, and the ore is of good quality and the ledge of good size all through the 1200 stopes.

The 1300 drift is in 124 ft. from the incline. As we wish to make a connection with the 1200 as soon as possihle, we have not taken the ledge down in this drift. We are now putting up a raise to the 1200, which will be through in ahout three weaks.

Preparations are now being made to commence sinking the incline for the 1400 level. In the last 100 ft. of sinking, the incline ran into the hanging wall. This made it quite expensive, and it is now thought hest to make a turn toward the footwall, and thus avoid working in the hard hanging wall rock.

During the year we have crushed 27,945 tons of rock. Of this amount 346½ tons came from the 1000 level and stopes; 9 753½ from the 1100; 15,527½ from the 1200; 1,977¾ from the 800, and 340 tons from the incline.

This gave a total yield of—

35,868 ozs. of bullion, value	$627,738.32
42 t ns of sulphurets	3,924.70
Tailings, worked on share	4,569.66
88 tons slime sold	4,569.66
Cost of working	1,584.00
Specimens	152.05
Total	$642,538.84

Yielding an average of $22.95⅞ per ton. Aversge cost of mining and milling per ton $9.51 1-9.

[The detailed statements of expenditures are summarized, but the aggregates will be found under the head of recapitulation.]

RECAPITULATION.

Mill and mining	$265,863.70
Saving sulphurets	2,042.50
Grinding tailings	1,378.07
Sinking incline	13,317.00
Sinking sump at 800 level	2,197.45
Air shaft	337.34
Opening bob pit in main incline	1,413.45
Retimbering main incline	420.94
V Flume	649.10
New engine at 1000 level	2,821.61
Repairs on brick pump house	1,980.34
New pumping engine	24,574.80
General account	19,356.08
Total	$336,368.41

Respectfully submitted,
EDWARD COLE, Supt.

Secretary's Report.

To the President and Stockholders of the Idaho Quartz Mining Company—GENTLEMEN:—The undersigned, Secretary of the above named company, in accordance with law and the by-laws of the company, submits for your consideration and action the fifteenth annual report of the oompany for the fiscal year ending Dec. 5th, 1881. At the commencement of the year just closed, there was in the treasury a casb balance of $29,262.29. By reference to the books of the company the several monthly reports of the superintendent, sustained by proper vouchers duly examined at each stated meeting of the Board of Trustees, the monthly receipts of the company from all sources for the year 1881, ending Dec. 5th, are as follows:

Dec., 1880	$10,270.62
Jan., 1881	66,951.39
Feb. "	52,018.39
Mar. "	52,271.13
Apr. "	51,390.54
May "	58,875.77
June "	56,655.47
July "	42,411.51
Aug. "	53,499.52
Sept. "	47,744.16
Oct. "	68,295.36
Nov. "	49,723.72
Total	$640,107.58
Cash on hand Dec 6, 1880	29,262.29
Assets for the year	$669,369.87

The monthly expenditures of the company for the period above, for all purposes amounted as follows:

Dec.	1880, including Dividend	137	$ 43,742 83
Jan.	1881, " "	138	48,804.77
Feb.	" " "	139	43,221.00
March	" " "	140	44,126.14
April	" " "	141	48,817.88
May	" " "	142	52,043.42
June	" " "	143	50,779.19
July	" " "	144	48,445.52
August	" " "	145	51,743 65
Sept.	" " "	446	54,236.23
Oct.	" " "	147	59,758.36
Nov.	" " "	148	61,834 40
Total			$607,018.41
Assets brought forward			569,360.87
Balance in Treasury Dec. 5, 1881			$ 61,751.46

To the foregoing monthly expenditures are included twelve dividends, declared by the Board of Trustees for the year herein stated, and at the time and amounts as follows:

Div. No.	Declared 1881	Per ct.	Amount.
137	Jan. 3,	5	$15,500
138	Feb. 7,	7½	23,250
139	Mar. 7,	7½	23,250
140	April 4,	7½	23,250
141	May 2,	7½	23,250
142	June 6,	7½	23,250
143	July 4,	7½	23,250
144	Aug. 1,	7½	23,250
145	Sept. 5,	7½	23,250
146	Oct. 8,	7½	23,250
147	Nov. 7,	7½	23,250
148	Dec. 5,	7½	23,250

Being for the year 12 dividends, paying 87½% and amounting to $271,250. The undersigned respeotfully refers the President and stockholders to the 15th annual report of the snperintendent of the mine and to the report of the Treasurer for detailed statements of the foregoing several summaries, and which are made a part of this report. Bafore closing this branch of the subject the Secretary deems it not inappropriate to present in epitomised form the aggregate receipts and expenditures of the company for the last thirteen years, that heing the time in which the mine has paid dividends, and before which only prospecting was done.

Receipts from all sources in the years:

1869	$ 306,038.75
1870	183,450.23
1871	407,301.16
1872	404,035.52
1873	1,010,612.20
1874	669,023.03
1875	509,430.72
1876	573,923.31
1877	525,435.18
1878	609,449.18
1879	501,033.15
1880	440,445.59
1881	640,107.58
Total receipts for 13 years	$6,780,295.60

There has been paid out in dividends to the stockholders as follows:

Year.	Dividend.	Per cent.	Amount.
1869	11	55½	$170,500
1870	7	12	37,200
1871	12	75	232,500
1872	11	52½	162,750
1873	12	220	682,000
1874	12	102½	317,750
1875	11	55½	172,050
1876	12	82½	255,750
1877	12	77½	240,250
1878	12	85	263,500
1879	12	54½	168,950
1880	12	41	127,100
1881	12	87½	271,250

Being for thirteen years 148 dividends and paying 1,000⅛%, amounting to $3,101,550.

The Secretary submits for the examinatiou of all stockholders all books and papers connected with this office. All of which is respectfully submitted. GEO. W. HILL, Secretary.

I. Q. M. Co.

To Edward Coleman, President.

Treasurer's Report.

To the President and Stockholders of the Idaho Quartz Mining Co.—GENTLEMEN: I herewith submit my annual report as Treasurer of said Co., for the year ending Dec. 5, 1881:

RECEIPTS.

By cash on hand Dec. 6, 1880	$ 29,262.20
Receipts from 35,868 ounces of bullion	627,738.32
Sulphurets	3,924.70
Sale of specimens	152.50
Percentage from tailings and slime	6,253.13
Pan rent	1,378.00
Sundries	660.03
Total receipts	$669,369.87

DISBURSEMENTS.

Paid Supt's. checks	$336,368.41
Paid 12 dividends	271,250.00
Total	$608,618.41
Balance cash on hand	$ 61,751.46

Respectfully submitted,
JOHN C. COLEMAN, Treasurer.

Treatment of Sulphurets.

From a letter in the London *Mining Journal* we take the following extracts:

In continuation of my letter I would observe before entering on the subject of the treatment of the pyrites which fills a considerable space in Mr. Lock's paper on the Causes of Success and Failnre in Gold Mining, read at the Society of Arts, it will be as well to examine the properties of mercury and the causes of its inefficiency—sickening, flouring, frothing up—when in contact with auro-pyrites. No assistance in this respect is derived from the paper nor from the discussion thereon, the impression being left that mercury mnst be taken with all faults, no substitute being possible. There is a law of chemistry, that simple substances only combine with simple snbstances, and compound only with compound substances. Free gold, metallic gold, a simple substance combines with mercury a simple substance. Mineralized gold, that is gold in combination with sulphnr, a compound substance, does not combine with mercury. It is popularly believed that gold exists in the metallic state only while chemistry recognizes several compounds of gold with other elementary substances, including aurous sulphide, Au_2S, and anrio sulphids, Au_2S_3. These sulphides of gold in association with sulphide of iron are the auro-pyrites found with the free gold. The metal mercnry also combines with sulphnr. Two sulpbides are known, mercurous oxide, Hg_2O, and mercurio oxide, HgO; the lattor is cinnibar, the mineral whence the metal mercury is obtained by sublimation. Mercury, gold and iron it will be seen have all an affinity for sulphur, and when the auro-pyrites, compounds of gold and iron with sulphur are in contact with the mercury, the affinity of that metal for the sulphur leads to a contest for its possession, and a disturbance ensues, the mercury sickening, flouring, frothing up causing a loss of both mercury and gold.

The treatment of the pyritos left with the tailings after extracting the free or metallic gold by amalgamation with mercury is the vexed question puzzling gold miners, and which all their knowledge is insnfficient to surmount. Every miner knows that roasting does not set free the gold in the pyrites and is anxious to know what will. The roasted mineral is never completely desulphurized, in the best cases enough sulphur remaining with the iron and the gold to prevent amalgamation with mercury. The agencies with which nature has operated to eliminate free or metallic gold from its asssociates, sulphur and iron, are heat, moisture, atmospheric air, and time. In the roasting process heat and air are present, moisture and time absent. The operations of nature have been protracted through long periods of time in remote ages, while the duration of the furnace roasting occupies 12 or at most 18 honrs.

The popular belief that gold exists only in the metallic form, native gold or free gold, has a compauion belief that gold unites with no other substance than mercury. Mr. Lock, under the bead "Occurrence of Gold" and "Treatment of the Pyrites," actually adopts the first, and by omitting mention of any substitute for mercury by implication adopts the second. The first having been disposed of the second remains to be considered. Mercury as a metal fluid at ordinary temperatnres presents a rough and ready method available in remote regions—where gold mines are for the most part situated—for the collection of free gold. In this case simple substances only are in question. Gold combines with other metals, which though solid at ordinary temperatures are fluid in a state of fusion. It is of every day occurrence that mineralized gold a compound is in the furnace brought into contact with mineralized copper, also a compound substance. Desulphurization takes place, the iron in association with the gold and the iron in association with the copper are slagged off, the gold remaining in association with the copper as a regnlus. This is commonly practiced in South America where ores rich in copper, gold and silver are found, the regulus finding its way to Swansea, where the copper, gold and silver contents are brought to the metallio form by the Ziervogel and Augustin processes, and thus in the present actually on the grand scale may he seen Mr. Lock'sspeculations on the fnture of gold mining. "Having" he says "secured the pyrites in a fairly clean condition the next etep is to extract the gold contained in them. This is often conducted as a separate branch of industry, especially where the proportion of pyrites yielded by the ores is too small to permit of each mine maintaining an establishment for the purpose, and where the necessary facilities, cheap fuel and skilled labor, do not exist."

"Securing the pyrites in a fairly clean condition" evidently means their concentration into a smaller hulk, the removal by mechanical means of the quartz or other matrix before shipment from the mine. This is correct as far as it goes, but it does not go far enough if the old practice of sluicing by water down inclined planes to catch the gold in mercnry tronghs and the pyritea on blankets are to be retained. The proposition so interpreted means two concentrating operations where one would suffice. It is hard to break with old habits or ideas. Mr. Lock does so gently, apeaka only of the concentration of pyrites, or what is termed the blanket aands, an entering wedge which will succeed by the holder plan of concentrating the whole mass of mineral as it comea from the stamps and collecting the free gold at the same time as the auro-pyrites, leaving but a small bulk remaining for combination with either mercury or copper. In the same discreet way Mr. Lock has introduced the substitution of air in the place of water as a medium of separation. Other projected improvements are from time to time brought forward. Mr. Hay Anderson proposes to supersede both etamps and water, and to adopt in their places Mr. Readwin's system of dry grinding in pans, with marcury medicated to prevent sickening. It is to be feared that grinding in pans proceeds at a speed too slow to satisfy the desires of shareholders for dividends. Supposing that an antidote will cure the mercnry of its disease, stamping a more rapid method of comminution than grinding, with preliminary concentration to reduce the bnlk to be subsequently ground, would remove an important objection. A French chemist proposes to use calomel, a compound of mercury with chlorine, Hg_2Cl_2, instead of the metal itself.

The more the subject is considered the more evident it will appear that it is indispensable to draw a broad line of distinction bstween mines supplying only the precious metal free gold, and mines yielding auro-pyrites only, or auro-pyrites mixed with free gold. The first only are suited to the rough and ready process of amalgamation with mercury. For the second class—termed base ores—ohcap fuel and skilled labor are primary necessities, as the gold thsy contain can only be extracted by chemical treatment in the furnace. To which olass the Indian mines belong the explorations now in progress will decide. Some reports recently published mention the presence of iron, regarding it as a hopeful sign of gold. It is quite probable that such mines with proper treatment may prove—of the two classes—the more profitable.

Timber Reservations.

Bills have been introduced in Congress setting aside as reservations for public parks certain groves of big trees (*Sequoia gigantea*) in this State, which in the main is a good thing. An old subscriber of the PRESS calls our attention, however, to the fact that there are two sides to the question of this reservation bnsiness. He has a somewhat different view from the general one, and as it is well to consider both sides, and be sure of being right before going ahead, his opinion is given publicity.

One bill introduced is to crsate a reservation on a very large tract of *Sequoia*, in Tulare, where, our informant says, that although the trees are large, there are only two noted ones. These are the General Grant and Hugh Miller, and they stand in the body of a large tract of timber, though they are some seven or eight miles apart.

Very few stop to consider that by reserving this large tract considerahle money is kept out of circulation. It contains upwards of 15,000 acres of timber, with perhaps 300,000,000 ft. of timber, of which probably 50,000,000 ft. are redwood, or *Sequoia*. It is bard to tell where one kind of tree leaves off and the other begins.

The tract lies on the south side of King's river, and has been so far untouched, becanse it was impossible to haul out or get at in any ordinary way. It will reqnire some $200,000 to utilize the tract, so that cutting and marketing would he of benefit to some persons, of course. Some capitalists had just made arrangements to utilize this tract, and were prepared to spend the above amonnt of money. The land, as it stands, is represented to be utterly worthless for any small operation, and can never be touched unless done cheaply on a large scale. Of course, as soon as the hill was introduced, the capitalists stopped work.

The gentleman to whom we refer, told ns, in answer to a question, that the damage around Lake Tahoe had been exaggerated. Some of the logs have been cnt off, but a very large proportion was still left around the shores. This was cnt for timber, not wood. It is only since they have commenced to cut down trees for wood. He thinks about one acre out of every 5,000 has been cut off the shores of Lake Tahoe, no more. It would be more sensible to create a reservation around the lake than in Tulare connty.

We present these opinions as those of persons who take a utilitarian view of the ordinary timber reservations. They do not think it just to reserve large tracts because a few noted trees exist there; and think that making timber is much better for the country than making timber reservations.

A NEW TORPEDO.—Trajan Theodoresco, a Roumanian engineer, is said to have recently invented a new torpedo, or submarine boat, the peculiarity of which is that it is capable of maneuvering under water 12 hours at a time. It is ahle to act at depths of from 100 ft. in rivers to 700 ft. or 800 ft. in the sea. Through the agency of screws it may be made to sink or rise noislessly, and either euddenly or gradually by snccessive stages, and can move or maneuver in any direction. The illumination of the vessel is internal and enables the officers upon her to see for a distance of 130 ft. under water.

In order to secnre the right of possession to a mining claim there must be compliance not only with the laws of the United States, but also with such *local* regulations of the mining district as are not in conflict therewith.

A Debris Compromise.

EDITORS PRESS:—Your correspondent in the PRESS of Dec. 17th, on a "debris compromise," and "proposed re-working of river beds," has advanced some good ideas, but are they feasible? In my judgment they are not, for want of sufficient fall in the rivers where the tailings are deposited. The best evidence of this is that in early years of California mining the debris commenced to lodge in the river channels, and the deposition has increased just in proportion to the increase of drift and hydraulic mining. I include drift mines because there are many such mines in the State that move and wash more ground in a year than one-third of the hydraulic mines.

Your correspondent, M. T., says "all these streams have a heavy fall or grade in the mountain region." I might here ask M. T. what he considers a heavy fall for sluice grade? There are, perhaps, more mines worked with six inches' fall to 12 ft., than any other grade, —220 ft. per mile. Very few flumes in hydraulic mines work at three inches to 12 ft. Even this grade would require 110 ft. per mile. Bear river originally had a fall of less than 70 ft. per mile for 20 miles, from the mining dump down. A flume on a grade of one inch and a half to 12 ft. would require about 55 ft. per mile. Does Mr. T. believe the tailings can be successfully handled on this grade? He must remember that in the first washing the loam, clays and lighter rocks passed on down, leaving the heavy quartz rocks, gravel and sand in the river beds. If there was sufficient fall to the rivers, the tailings would long since have been worked and dumped into outside basins.

The Yuba river at Smartsville originally had 22 ft. fall per mile, and at San Juan 34 ft. per mile. From these points up the fall increases rapidly. I mention these two points because they are very extensive mining districts. It seems to me utterly impossible to move the tailings to bedrock that are deposited in either of these rivers. The American and Feather rivers are subject to the same general laws.

I have for many years held that the only sure and safe way to control the debris from the mines will be to levee the rivers, condemn and pay for certain lands between the Yuba and Bear rivers, and between the latter river and the American, let the lands be built up by the overflow from waste weirs in the levees. A levee along the east bank of the Feather and Sacramento rivers, and also on north bank of the American river from month to high land, say sluice levees should be as high as the average high water mark, this would hold the water and settle it so that when it escaped through waste weirs to the river, it would be very free from matter.

Can this be done? Why not? Let the General Government come to the front and aid the State; let the State, by law, appoint a commission to survey, appraise at a fair valuation, the land required; pay for these lands; it will work; no hardship for a man to sell his farm at a fair price.

When these lands are filled up to, say, high water mark, the Feather and Sacramento rivers can be flumed and the slickens carried across and dumped in the tule for an indefinite period.

There has been one-third money enough expended in litigation and extravagant expenditures on levees and dams to accomplish what I propose. This done all will be happy, and the production of $20,000,000 gold annually will continue.

Now, Mr. Editor, I ask in all candor, will not the General Government aid in this matter? Say it does cost $1,000,000 or $2,000,000; are not the mining and agricultural interests of California of sufficient importance to demand this relief? Most certainly.

Suppose the miners finally gain their point and are allowed to mine without let or hindrance. It ought not to affect my proposition, for under it, all matter carried in suspension would be settled within the ponds and tule, and the water would go comparatively clear to the ocean.

A. F. W.

Oakland, Dec. 19, 1881.

THE student who aims to become something more than a learner—namely a doer, possibly a creator—must never allow himself to think that the possibilities of any fact or phenomenon have been exhausted—so far, we mean, as its utilization is concerned. The habit of inventing, in other words, seeking novel and useful applications for the knowledge gained, should go hand in hand with acquisition. The apparent progress will not be so rapid perhaps as by the method of "cramming," but it will be real and not liable to backsliding, while the possible profit of it will be incomparably greater.

DANIEL HALE HASKELL, in early days the head of the banking firm of Adams & Co., died at the Alms House last Saturday evening, at the age of 65 years. After the dissolution of the banking firm Adams became addicted to drink. He was, on Friday last, arrested for begging, and on the day following was sent by Judge Rix to the Alms House, where he died about 5 o'clock in the evening, shortly after his arrival.

EVERYTHING promises a brisk mining season in Shasta and Trinity.

Useful Information.

THE FASCINATION OF BIRDS BY SNAKES.—Catherine C. Hopely suggests in *Land and Water* a new theory of the so called fascination of birds by snakes. It is that the bird mistakes the snake's tongue, which the animal keeps in constant motion, while it otherwise remains perfectly still, for a lively worm, and gazes at it with the expectation of making food of it. The idea was suggested by observations at the Zoological gardens, where the birds where frequently seen watching the tongues of the snakes. Commenting upon the above the *Germantown Telegraph* says: This, we think, is a mistake. Judge Miller, of Missouri, told us a month or so ago that he had two plants of fine lettuce of which he desired to preserve the seed; but as the seed matured the goldfinches preyed upon them to such an extent as likely to rob him of all his prized seed. So, to preserve what there was left, he constructed an artificial snake of some striped stuff, filled it with bran, curled it up and placed it near the stalks, where the birds could see it plainly; and the result was that not a bird approached the plant.

A HEAT CONSERVATOR.—An important and useful invention is a method for keeping coffee, tea, chocolate and other kinds of drinks and food hot from one to 20 hours, the quality of the articles preserved being unchanged. No artificial heat is used in the process, and its practicability was demonstrated Thanksgiving day by A. L. Moffit, of Boston. A 10-gallon tank of hot coffee was made at 6 A. M., and shipped to a hotel in the country, when it was served to the guests at 3 P. M.—hot; as if it had just come from the fire; at 10 P. M. the temperature was but little changed, and 28 hours after the coffee was made, it was still warm enough to form a pleasant drink. It was kept in a wooden tank, quite apart from any heating surface, the tank presumably lined or interlined with some extraordinary heat-conserving material.

OUR PACIFIC SEAL-SKIN INTEREST.—An abstract of the preliminary report of a special agent of the U. S. Census Bureau shows that the total seal skins and sea-otter skins taken on our Pacific coast during 1880 was about 160,000. Of sea-otter, having an average value of $50 per skin, there were 3,500 captured in Alaska and 75 in California. Of the fur seal there was a total of 155,000 taken, of which 147,000 were taken in Alaska, valued at $10 each; 6,000 in Washington Territory and 2,000 in California, valued at only $5 per skin. The total value in first hands is about $1,750,000. The total capital invested in the business, excepting Indian canoes and material, which no attempt was made to value, is about $750,000.

BROWN BRASS.—The following recipe is said to produce a good brown tone upon brass: The article, after having been thoroughly cleansed and freed of all traces of grease, then polished, is dipped for about half a minute into a cold solution of 10 grams of hypomanganate of potash, 50 grs. green vitriol, 5 grs. muriatic acid, and 1 liter water; then rinse well and dry in fine soft sawdust; if a reddish cast is desired, dip the article into a second bath heated to 60° C., of 10 grs. chromic acid, 10 grs. chloric acid, 10 grs. hypomanganate of potash, and 50 grs. blue vitriol (sulphate of copper) dissolved in 1 liter water. The latter mixture alone produces a light bronze. The article may afterward be heated in an oven, which operation, it is said, produces a very rich tone.

IMITATION GROUND GLASS.—A very useful kind of varnish is made known by Leon Vidal, which is excellent for producing imitation of ground glass, and will doubtless be found available for other purposes. The formula is: Sandarac, 18 parts; mastic, 4 parts; ether, 200 parts; benzol, 80 to 100 parts. It would be well if the ether in its composition could be replaced by some less expensive liquid, otherwise the cost of coating a large window would be rather considerable. Perhaps some one will be able to improve upon this formula. One great advantage of such a varnish is that it can be easily removed when no longer required to produce an opaque or semi-translucent window.

IMPROVED INDIA RUBBER.—A French inventor has recently patented a method of improving India rubber and gutta-percha by the addition of a distillate of birch bark. By distilling the outer layers of the bark he obtains a dense, black, gummy matter, which possesses the properties of ordinary gutta-percha, with the additional quality of resisting both the action of air and the strongest corrosive acids. He claims also that by adding a small proportion of the birch bark gum to gutta-percha or to India rubber (one-twentieth part will suffice), the durability of the rubber or the gutta-percha will be greatly increased, the new mixture not being acted upon by the air or by acids.

CASH BOYS are being superseded in a Boston store by a mechanical arrangement for conveying purchase money from the sales clerks to the cashier's desk, and returning the change. The device is essentially a duplex system of inclined grooves connecting the stations of the various clerks with the cashier's desk. The money is placed in hollow balls which readily traverse the inclined grooves back and forth by the force of gravity.

CHESTNUT FLOUR is made by drying, or, rather, roasting fresh chestnuts for three days and nights in a drying room, on a latticed floor covering a chamber in which a fire is lighted. The husk is then easily removable, and the kernel is ready to be ground into flour, which is of a pinkish color. This is mixed to the consistence of cream with water, and poured on fresh chestnut leaves to be baked into small circular cakes between heated stones. Chemical analysis shows it to contain 40% of nutritious matter soluble in pure water, and it ought to be easy of digestion and suitable for children's food.

CEMENT FOR GLASS.—To make a cement for glass that will resist acids, take 10½ lbs. of pulverized stone and glass, and mix with it 4½ lbs. of sulphur. Subject the mixture to such a degree of heat that the sulphur melts. Stir until the whole becomes homogeneous, and then run into molds. When required for use it is to be heated to 248°, at which temperature it melts, and may be employed in the usual manner. It resists the action of acids, never changes in the air and is not affected in boiling water. At 230° it is said to be as hard as stone.

COLORING GLASS.—Colors are usually imparted to glass in the melting pot; for blue, oxide of cobalt is used; for red or gold, suboxide of copper. Glass is stained by painting its surface with a fusible-colored glass ground to a fine powder and mixed up with gum water or turpentine, and, after trying, then heating the painted glass in a furnace until the coating fuses. Collodion, shellac or spirit-copal varnishes, properly colored with one of the coal-tar dyes, can in some cases be advantageously employed as a colored wash for white glass.

"AMERICAN ARROWROOT" is not arrowroot at all, but simply potato starch. As *maranta arunainacea*, the source of true arrowroot, has been grown in some of the Southern States, "American arrowroot" is, possibly, an article of commerce, but if so, it is not sold under that name. What is bought and sold as American arrowroot is in no sense arrowroot at all, and yet, the consumers, at least, are led, by that name, to think that it is. Let the authorities start their experts to examine the article.

SOAP-BUBBLE BALLOONS.—Much amusement may be afforded by making soap-bubbles with ordinary gas conducted through a caoutchouc tube and clay pips to glycerine soap solution. A small disk of thin paper, with fine wire from its center to a little paper car with aeronaut figures may be connected to the bubble when it begins to swell. The disk being attached by capillarity to the part where the drop forms, the detached bubble rises with its car.

Good Health.

SWEET FLAG CANDY.—If what the *Country Gentleman* says of this in the following paragraph is correct, the roots of this plant may be really valuable: Sweet-flag candy is relished by all lovers of sweetmeats, and it is a valuable aid to digestion, as it will stop the disagreeable rising of gas, so annoying to dyspeptics. Being eaten greedily by children, it is often better than other medicine. A bit held in the mouth when one is caring for the sick will often counteract the effect of contagious germs. To prepare it, take fresh, healthy roots of sweet-flag, and after a careful washing, cut in slices one-eighth of an inch in thickness. Put them into a stewpan or bright basin, and pour a little more cold water over them than will cover them. Set on the stove and heat slowly; when the water boils turn it off. If the candy is desired for medicine, quite enough of the strength has been removed, but for a sweetmeat it is better if boiled up, and the water turned off four or five times. Now measure the sliced roots, and to each two cupfuls allow one and a half cupfuls of white sugar, turn on water enough to cover, return to the stove and simmer slowly, stirring often, until the water has quite boiled away; then turn out on buttered plates, and stir frequently until dry. The long simmering after the sugar is added makes the roots quite tender, and the candy will keep fresh and nice for years.

THE TREATMENT OF BURNS.—The London *Medical Record* says that Dr. J. Troizki, in a Russian medical journal, adds his testimony to that already published as to the value of solution of *bicarbonate of soda* as a dressing for burns. He says that during the previous year he noticed 25 cases of burns, mostly of a severe nature. Sixteen of them were received in a fire in a village, during a strong wind, when the inhabitants, in order to save their property, were obliged to work in the flames. In all these 25 cases bicarbonate of soda was exclusively applied. The result of this treatment was so favorable that the author considers himself justified in pronouncing this remedy the best and most efficient in burns of all kinds and degrees. Even in extensive burns of the second and third degrees, the pain was soon alleviated by the application of compresses soaked in a solution of bicarbonate of soda; and the wounds soon healed, leaving but few scars, and no impairment of the functions of the affected parts. No evil results from this extensive use of bicarbonate of soda, which might suggest the reception of carbonate acid into the blood, were noticed.

HOW VOLTAIRE CURED THE DECAY OF HIS STOMACH.—In the "Memoirs of Count Segur" there is the following anecdote: "My mother, the Countess de Segur, being asked by Voltaire respecting her health, told him that the most painful feeling she had arose from the decay in her stomach, and the difficulty of finding any kind of aliment that it could bear. Voltaire, by way of consolation, assured her that he was once for nearly a year in the same state, and believed to be incurable, but that, nevertheless, a very simple remedy had restored him. It consisted in taking no other nourishment than yolks of eggs beaten up with the flour of potatoes and water." Though this circumstance concerned so extraordinary a person as Voltaire, it is astonishing how little it is known and how rarely the remedy has been practiced. Its efficacy, however, in cases of debility, cannot be questioned, and the following is the mode of preparing this valuable article of food as recommended by Sir John Sinclair: Beat up an egg in a bowl and then add six tablespoonfuls of cold water, mixing the whole well together; then add two tablespoonfuls of farina of potatoes; let it be mixed thoroughly with the liquid in the bowl; then pour in as much boiling water as will convert the whole into a jelly, and mix it well. It may be taken alone or with the addition of a little milk in case of stomachic debility or consumptive disorders.

PEOPLE sleep with their mouth open, and thus make this organ perform a duty which should be performed by the nose. There are many objections to this. The air in passing through the channels of the nose, for instance, is raised to the temperature of the body before it reaches the larnyx. Thus breathing, no matter how low the temperature may be, the sense of cold is never felt below the border of the soft palate. But when one breathes through the mouth on a cold day the sensation proceeds as far as the larnyx, and an irritating cough may be caused. Then, again, in nose-breathing the air is moistened by the natural secretions which cover the turbinated bones in a condition of health, and the short, bristly hairs at the opening of the nostrils act as a filter to arrest impurities and reduce the likelihood of laryngial, bronchial or pulmonary disease. Infants, athletes, savages and animals breathe through the nose; the ordinary civilized man employs the mouth to an unnecessary, and often to a very injurious, extent.—*Journal of Health.*

NEAR-SIGHTEDNESS.—Persons living in cities begin to wear glasses earlier than country people, from the want of opportunities of looking at things at a distance. Those who wish to put far off the evil days of "spectacles" should accustom themselves to long views. The eye is always relieved and sees better if, after reading a while, we direct the sight to some far-distant object, even for a minute. Great travelers and hunters are seldom near-sighted. Sailors discern objects at a great distance with considerable distinctness, when a common eye sees nothing at all. One is reported to have such an acute sight, that he could tell when he was going to see an object. On one occasion, when the ship was in a sinking condition, and all were exceedingly anxious for a sight of land, he reported from the look-out that he could not exactly see the shore, but he could pretty near do it.—*Journal of Health.*

VACCINATION APPROVED.—It is singular that any well-informed person should entertain a doubt as to the efficacy of vaccination in the prevention of smallpox, yet there is considerable incredulity on the subject. The St. Louis Board of Health reflected for some time on this head, but finally decided in favor of vaccination. One firm basis for its belief, it is stated, was drawn from the fact that "not a death from smallpox has occurred in that city for five years, during which period vaccination has been more generally practiced than, perhaps, in any other large city in the country." Those communities which neglect vaccination, generally have a sad experience to convince them of their error.

TOBACCO AND COLOR BLINDNESS.—A Belgian physician has ascertained, during a tour of observation and inquiry made at the request of the government authorities, that the very general use of tobacco is the main cause of color blindness; and this affection is now occasioning no slight anxiety both in Belgium and Germany from its influence on railway accidents, and also from the military point of view. It is not surprising, therefore, that these facts have led to the issuing of orders in certain towns of Germany, forbidding all lads under 16 years of age from smoking in the streets.

COMFORT FOR GUM CHEWERS.—The spruce gum industry of Maine is represented to be in a highly flourishing condition. Men who range the woods collecting the gum make good wages, selling the article for 40 cts. a pound. Altogether, residents of the State obtain $40,000 yearly by the sale of the article. Inquiry concerning its use discloses the interesting fact that it is sold chiefly to factory girls. A further investigation regarding the dangers of lockjaw and paralysis of the tongue in noisy factories, and the use of chewing gum as a preventative, is now suggested.

THERE were severe gales and heavy rains throughout England, on Saturday and Sunday, many houses being unroofed and partly demolished, rivers overflowed and trees prostrated,

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SAN FRANCISCO:
Saturday Morning, Dec. 31, 1881

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Passing Events.

With this number of the MINING AND SCIENTIFIC PRESS we conclude Volume XLIII., a "passing event" of which our readers are asked to take special note, as it is a very proper time to renew subscriptions. We refer more fully to it, however, in another column.

The Gold Run case at Sacramento still moves on slowly, taking testimony not having yet been concluded. The testimony is very voluminous and much of it contradictory; but few people interested in "debris" can speak of the subject without difference of opinion. People looking at the same subject from different standpoints naturally reach different conclusions.

Attention is called to an interesting letter on the second page of this number, which gives some valuable facts concerning the debris question in Placer county. Our readers are also requested to note that there is considerable original correspondence in this number of the PRESS, all of which is worthy of careful perusal.

The copious index on the last page shows what a wide range of subjects has been treated in the volume. Our readers will do well to file the PRESS, since, with the index, it forms a reference on mining and metallurgical matters nowhere else to be found.

Our columns are so crowded this week that we omit the usual illustration from the ninth page.

To all our readers, A HAPPY NEW YEAR. May the sun of prosperity illumine your homes and warm your hearts. May the right and the true fill your minds, elevate your aspirations, and be the secret of your successes. May death pass you by; may disease be averted, and the circle of blessings, led in by the revolving months, be unbroken.

Close of the Volume.

This number is the final one of Volume XLIII of the MINING AND SCIENTIFIC PRESS, and we feel assured that our readers will acknowledge that the volume has contained a mass of information, on all topics, which has been both interesting and valuable to them.

The copious index, which fills the last page of this paper, is a sufficient indication of the scope and variety of the subjects treated during the past six months, to convince anyone of the trouble we have taken to collect miscellaneous, technical information of every kind.

It is hardly necessary for us to review the contents of the volume even in the abstract. The pages have spoken for themselves. We have endeavored to keep the PRESS abreast of the progressive times in which we move; and to keep for our readers a careful watch on all that could be useful or instructive to them. We have on several occasions given double numbers, containing special information; and propose in the future to do this even more frequently, as occasion offers.

We will begin the new volume with renewed energy and vigor, and a consciousness that as "times" are improving and mining fields widening, the PRESS will also improve and have larger and wider opportunities for gathering information of use to its special readers.

All that we ask is the kind co-operation and assistance of those to whose interests we are indebted, and we feel that both will be extended to us in the future as in the past.

The Congressional Mining Committees.

New York, world-renowned for the extent of its mining industry, in the distribution of favors gets the chairmanship of the House Committee of Mines and Mining. There is a special fitness in this, as it seems to be the prevailing policy to put people where they are not wanted, and where they will only have "not to do it." The chairmanship of the Committee on Commerce, which that State ought to have had, it did not get, and a growl arises, as she is not represented at all in said committee; but the chairmanship of the Committee on Commerce is given to Page, of California. Why the positions were not reversed, taking into consideration the interests of the respective States, it is hard for one not a politician to see.

The House Committee on Mines and Mining consists of Van Voorhees, of New York, Chairman; Brigham, Barry and Cassidy. Mr. Owry, of Arizona, a Territorial delegate, will take part in the deliberations of the committee, but cannot, of course, vote. No better man than Gen. Rosecrans could have been found to have put on this committee, as he is familiar with mines and mining interests of this coast, having worked practically at their development, and is, moreover, in sympathy with the working miners.

The Senate Mining Committee, for the first time in many years, is now controlled by Senators of practical experience. Still there are some there who know nothing and care nothing about mining. Hill, of Colorado, is Chairman; Miller, of this State; Fair, of Nevada; and Jones, of Nevada, are on the committee; Van Wyck, Hampton and Camden are the others. The debris bills which have been introduced, will, in all probability, go to the Commerce Committee, which has charge of the improvements of rivers and harbors. With Mr. Page on this committee, there may be something done about our harbor of refuge on this coast, and the improvement of our rivers will be more closely looked after. For a Californian to be chairman of so important a committee is somewhat novel; but perhaps the Government is finding that San Francisco has a commerce worth noticing.

Re-Locating Claims on Sunday.

The 1st of January will be on Sunday and some persons may think this being a legal holiday, will not be a day on which claims may be re-located legally. But Monday will also be a legal holiday, being the one on which New Year's day is celebrated. Without pretending to know more about it than others, the PRESS advises men to be on hand on the Sunday morning and then they will be on the safe side. The reason we advise this is that the Secretary of the Interior, in July, 1879, in a written opinion to the Commissioner of the General Land Office, took the ground that in the absence of a law to the contrary, an adverse claim may be filed on Sunday, or out of office hours, if the local officers are willing to receive it. He said: "While it is true that officers are not expected nor required to transact business out of office hours or on Sunday, still there is no law of the United States prohibiting them from doing such business. Nor am I able to find any law of the State of Nevada which prohibits the transaction of ordinary business on the Sabbath day."

By a parity of reasoning there seems nothing to prevent men locating or relocating claims on Sunday. Therefore it would be unwise to delay beginning the annual assessment work on mines until Tuesday the 3d because the 1st and 2nd of January were both legal holidays. The one who did begin work on that day (the 1st), would be the most likely to hold the claim. At least that is our opinion.

Foundry Notes.

At the Union Iron Works, in this city, in addition to considerable mining and miscellaneous work they are engaged on some marine machinery which merits attention. It consists of a compound surface condensing engine for the new Coos Bay propellor, for E. E. Dean & Co., now lying in Oakland creek. The initial cylinder is 20 inches in diameter and the expansion cylinder 38 inches; stroke 30 inches. The crank shaft of the engine is made in sections and built up. It is specially heavy and is made in nine separate pieces. It is 10 inches in diameter and the crank pins are 10 inches in diameter.

The valves are of the O'Neill patent and are worked by the O'Neill valve motion and cut-off. The cut-off is placed on each cylinder. This is an advantage where varying pressures are liable to be used. Were the pressure varies the cut-off can be varied to equalize pressure in each cylinder. The air pumps are 16 inches in diameter, 15-inch stroke; and there are three inch feed and bilge pumps. These are all worked from a beam connected to the low pressure cross heads. The thrust bearing is secured to a projection cast on the main bed plate and has also the usual bolts, etc.

The circulating pump is an independent rotary pump worked by vertical engines. The propeller is 10 ft. in diameter, 13½ ft. pitch. It has a 9-inch propeller shaft, brass lined, where it passes through the stern bearing. The boilers are four in number—5 ft. 6 inches in diameter, and 8 ft. 6 inches long, and with single flues 32 inches in diameter and 6 ft. long. These are placed fore and aft, and arranged in pairs, so that any pair or one boiler may be disconnected. Two superheaters, 5 ft. in diameter, 5 ft. high, each with four 16-inch flues, are provided. The superheaters are connected by a breeching, to which the stack is attached. This engine has been designed for strength and compactness, and is all made first-class in every respect. It is in every way a very creditable piece of work.

Among other things, the works are engaged on a new double pump hoist for the Bullion mine for lifting pump rods, etc., from the pump compartment. The cylinders are 16 inches in diameter, and 24-inch stroke. The engines are connected by crank shafts, 10 inches in diameter in center, 8½-inch bearings. The engines are of the ordinary plain slide valve link motion type; and the engine beds are extended out so as to carry a spur wheel shaft. This shaft is 14 inches in diameter in the center.

There is a single 34-inch pinion on the engine shaft, made with V teeth, 4½-inch pitch. The fly-wheel is 10 ft. diameter, arranged with brakes. The spur gear is 167 inches in diameter, 4½ inch pitch, and has V teeth. The reels are made for flat wire ropes, and are small—4 ft.; outside diameter, 16 ft. The arms are bolted to a central hub. It is intended for 6-inch rope. The reels are arranged with indicators running back to a convenient position for the engineer. The whole thing is so arranged that all parts are easily seen and managed by the engineer. It is intended only for raising and lowering pumps and pump rods and all work in the pump shaft; so it is to run somewhat slower than the ordinary hoists.

They are just starting on a pair of 12x36 double hoists for the South Wellington colliery. This is a link-motion outfit, an exact duplicate of that furnished to the same company about three years ago. The engines are connected by a seven-inch crank shaft. There are two winding drums for round rope, 6 ft. in diameter, 4 ft. wide, connected together and driven by spur gear 77½ inches in diameter, 3 inch pitch, 10 inch face. The single pinion on the engine shaft is 25¾ inches in diameter.

The reels are placed in front of the engine and the bearings for the same are bolted to the engine bed. The fly wheel on the engine shaft is fitted with strap brake and foot lever; the reels are also fitted with brakes. This is a substantial and not very expensive style of hoist for mines.

They are just starting a 20 stamp mill for the Lake Valley mine, Mexico, fitted with a 20x48 in. O'Neill cut-off engine, an exact duplicate of the one being built for the Idaho mine, and which we shall describe in detail shortly. With this engine go four 54x16 boilers. The 20 stamp mill is a wet crushing one for silver. There are 16 combination pans and 8 Boss' standard settlers, two agitators and clean up pan, retorts, etc. Another engine 14x48 is also being built for a quartz mill in Mexico.

THE *Silver State* learns that Emmons & Young shipped a carload of antimony ore from Lovelock, which was taken from their mine near that place. By assorting the ore it averaged 60% antimony. It is said they have, without doubt, the most extensive antimony mine on the coast. The mountain upon which this mine is located is said to be a mass of antimony.

Relocations of Mining Claims.

In the last number of the MINING AND SCIENTIFIC PRESS we summarized the laws and decisions relative to the annual expenditures required by the U. S. mining laws, in view of the fact that this was the last week of the year and that miners were apt to forget all the details. In this issue we do the same thing with reference to "relocations," because, on the 1st day of January many claims will be subject to location by reason of failure to perform the annual assessment work.

But before we begin speaking about relocation, it is as well to remind miners that if they located their claims during 1881, they need do no assessment work before Dec. 31, 1882, and that the said claim is not relocatable until Jan. 1, 1883. The reason of this is that the law specifies that the year in which assessment work is due begins on the 1st of Jan. after the date of location, and this work can be done *any time* during that year. If the claim was located any time in 1880 the work was due any time in 1881, and if not done this week the claim is relocatable on the 1st of January, 1882, *provided* you are not on the ground on that day doing the work. The law, after telling about the amount of work to be done, says: "Upon a failure to comply with the foregoing conditions of annual expenditure, the claim or mine upon which said failure occurred shall be open to relocation in the same manner as if no location of the same land had ever been made: *Provided*, that the original locators, their heirs or assigns or legal representatives have not resumed work upon the claim after failure and before such location."

There is no doubt that some people have relocated claims which are not relocatable, from a misconception of the law.

It is as well to remind miners that when they do their work they should record it. We gave in last week's PRESS the form for "Proof of Labor."

The following form is a notice of location as given in "Copp's Mining Laws:

Notice of Location.

Notice is hereby given that the undersigned, having complied with the requirements of Chapter Six of Title Thirty-two of the Revised Statutes of the United States, and the local customs, laws and regulations, has located ——linear feet on the ——lode [20 acres of placer mining ground], situated in ——Mining District, ——County, ——, and described as follows:

[*Describe the claim accurately (by courses and distances, if possible), with reference to some natural object or permanent monument, and mark the boundaries by suitable monuments; if a placer claim is located on surveyed land, describe the legal subdivision.*]

Discovered ——, 188—. —— ——, Locator.
Located ——, 188—.
Attest:
——
——
Recorded ——, 188—.

In locations of abandoned mines (relocations), the fact that it is such a location should be stated, and the affidavits of two or more respectable parties that such mine was abandoned and subject to relocation, should be recorded with the location notice.

Where the location is by agent, that fact should be stated after the name of the locator, thus: By Thomas Jones, agent (or attorney).

Record of location notices in the absence of a district recorder should be made with the proper recorder of deeds from the county wherein the claim is situated. It is advisable to have these notices attested by witnesses, for locators cannot be too careful about their evidence.

If you are going to relocate a claim of your own for any reason, as for more particular identification or description, use the form given above, but state, after the description, that it is a relocation, and, in addition, where the original location is recorded, in order that the title may revert back to the original discovery.

Work on a claim is work done anywhere upon the surface of it within its surface lines or anywhere below the surface within those lines extended down vertically; and though it should be shown that the work done within the lines below the surface was also within a lode having its apex outside of such vertical surface lines, it will still be work on the claim within the meaning of Section 2324 of the U. S. Revised Statutes.

The notice of location need not necessarily be placed on ore, or on any part of the vein or lode; but it is sufficient if placed in sufficient proximity and relation to the ledge as in connection with the work done under it, to give notice to all comers what ledge is intended.

If one takes up a claim as the agent of another, the title vests in the other and the agent, by his mere act, cannot subsequently divest it.

There is no law to prevent a person from relocating his own mining claim by a different name; and if he does so and then conveys it by the latter name, there is no reason why the existence of the former location should invalidate the deed.

If several persons locate a claim and by a failure to comply with law forfeit it, it may be relocated by a part of the first locators, along with others who were strangers to the first locations; and those whose names are left out of the notice of relocation cease to have any interest in the mine.

The relocation of an abandoned claim by a prospector, outfitted by another under an arrangement to share equally in all discoveries amounts to the same thing as if the prospector had located a new discovery.

When one or more parties firet locating mining gronnd afterwards made a second location on the same lode, with the names of other parties added to the notice of location, it appearing at the time of the sscond location the ground was undeveloped, and it was not known that both notices were on the same lodc; and it further appearing that the second notice was posted for the express purpose of protecting the original location, a Nevada court hsld that the second location did not of itself constitute an abandonment of the first location.

When the first claimant who takes up a claim is not a citizen, or has forfeited hie right by noncompliance with the mining laws, or abandoned his claim, the mining groond staked off by him is open to location hy any U. S. citizen.

Posting a notice on a tree at each end of a claim, or sticking up a pile of rocks in the middle of the claim, is not sufficient compliance with the law, whicb requiree a location or relocation to be "distinotly marked on the ground so that its boondariee can be readily tracsd." Any marking by etakes, moonds and notices will do, hut tbey must be such that the *boundaries* may be traced.

Where a party applies for a patent on a relocated mine bo must prove that the reqnired $500 has been spent on the mine by himself or grantors; and the fact that tbe original owners, who afterward abandoned it, spent that amount, does not relieve the rslocator of the responeihility of doing that much work.

Alisns cannot hold a mining claim prior to iseoance of the patent. An aeeignor can tranefer no greater intereet than he has, and the purcheser from an alien of an unpatented mine acquiree no title thereto. Such purchaser, however, may relocate the claim and thereby acquire a poeeessory title on complying with local and general laws.

The Act of Congress of January 22, 1880 (referring to expenditures) doee not annul the provisione of the State (Colorado) law, which requires a diecovery shaft to be sunk within a certain number of daye from date of discovery.

It will be remembered that the United States lawe provide that "miners of each district may mske regulatione not in conflict with the lawe of the United Statee," etc. In the same section it ie provided as one of the requirements that *not less* than certain amounts named sball be annually expended on lode claims. It follows that the State, territory or district laws may require *more* then the amount named in the United States law, it cannot make a less requirement, becenee it would be in conflict with the lawe of the United Statee, which name the least sum which will preclude relocation.

The Commissioner of the General Laud Office, in a written opinion of Oct. 21, 1881, eaid: "The local lawe may require expenditures to he made in a certain manoer end within certain periods not named in the U. S. Law."

The man who contributes his proportion of the *required* expenditures can retain his interest in the mine. If he fails to contribnte his proportion of the *actual* expenditnree the remedy must he sought in the courts, not in the Land Office.

Where a party abandone a mining claim, be has the undoubted right to remove from said claim any machinery or buildings he may have placed thereon, or auy ore he may have extracted from the mine. The ore in tbe dump ie, therefore, the original owners.

A party relocating an abandoned mine may either eink new shafte and run new tunnels, or continue the work upon snch ehafts or tunnels as may have been constructed by parties who had ahandoned the same.

While bolding possession for the purpose of making tbe development reqoired hy law, the locator's rigbt to the lode ie complete and it cannot be conveyed except by deed. It may neverthelese be loet hy abandonment, or by volunterily yielding the poseession to another whicb ie the same thing. And eo if the locator admits another to the poeession witb him, this will amount to an ahandonment *pro tanto*, and a retaking by tbe party admitted, upon which they will become interested in the lode jointly, or otherwiee, according to their agreement. In these particulare the rule ie the eame when applied to the relocation of an abendoned claim.

Minere mnet not only comply to Government laws but alao to locel regulatione of the dietricte where theee ledgee are located.

Where a rule or custom of minere in force, requiree a location to he recorded euch recording is necessary, otherwise not; but it is best to he on the safe eide and record any how.

The removal of a locator'e notice, marks, etc., hy othere doee not divest bim of his rights.

If the local mining laws of a district provide that, ou a failure to work and notice a claim as required hy the mining laws, the claim shall be coneidered ae abandoned. A failure to comply with such lawe is an abandonment of tbe claim, and it is opsn to location as vacant ground.

Tbe failure to perform the amount of work on a mining claim required hy the local mining lawe or regulatione etabliehed and in force in the district, amounts to an ahandonment of the claim, and thereupon it mey he occupied and appropriated by another.

If the poeeession of the occupant be continued in another, hy the expression of a wish or deeire of the occupant to another that he succeed to the poseession, and he thereupon takes poesession, a gift is the result; there is *no* vacancy in the possesaion, and conequently no abandonment.

Miners will remember tbat claims located eince May 10, 1872, reqnire $100 of work each calendar year, and mines located prior to tbat date require $10 wortb of work for each 100 ft. on the claim.

With regard to the qusstion of locating claims on *Sunday*, we have something to say in another column of this number.

In the next nomber of the PRESS we will give our mining friends some points on miniog partnership, and show ehow them how to get rid of non-paying partners.

Deep Mining.

The Problem as it ie Being Worked on the Comstock.

[Written for the PRESS by JAMES DELAVAN.]

The workings of the minee of tbe Comstock have been carried to great depths, reaching from 2,000 to 3,000 ft., and the resnlt has not bssu very satiefactory below the 1600 levels. It is true that the Union Con. had ore from the 2100 level to the 2400, but in the otber mines no coneiderable nmount of high-grade ore has been developed below the 1600 level. It woold eeem that it is useless to go to any depth below that with the expectation of finding bonanza ore. In tbe lower levele already reached the eame vein matsrial continues to be found se was found above, and eome qoartz, which is barren, or so nearly eo, that it will not pay the expenee of mining and milling it. Thus far, it hes become a eettled fact that it ie useleee to penetrate the earth to so great depths as bes heen doue in the Comstock mines with the expectation of finding ore in sufficient quantity and quality to make it remunerative. That fact hes been demonstrated. As to why it is so, there are different theoriee. One is that the rocke and water are eo mucb heated that what mineral there is, is beld in eolution and cannot crystallize and become solidified. Therefore, at any point below the 1600 or 2000 level the heat is so intense that it is impoeeible for the preciouo metale to become of sufficient deneity to combine with the matrix, and therefore ore need not be expected to be found there.

It has been hoped that the water in the earth would be found at a certain depth, to have changed from a high temperatore to a much lower one, and that these bodies of ore would be found as they were in the uppar levels; but thus far that has not been the case, and I am of the opinion that it will never bs.

The workings on the Comstock and experience in the mines may serve as a guide to miners in other localitiee, ae when it will be necessary to ceaee psnetrating the earth in search of the precious metale; and, therefore, a great amount of expensive work would be saved where there was no hope of adequate returns. Some of our so-called mines, worked to a depth of 2,500 and 2,800 ft., although large amounte of qnartz rock have been found in them, are almost barren of tbe precious metale. Most of them have had good ore at and near the surface, and to a depth of 1,000 and 1,600 ft. If bodies of high grade or bonanza ore are found on the 2600 level and down to the 3,000, then it may be said that the theory as to the beat preventing the crystalization of the metels and being held in eolution is incorrect. That fact will be demonstrated, as I suppose that work will be contioued, until the 3,000 level has been attained. The Yellow Jacket mine reeched the 3,000 level some time eince, and the company hae had many drifts and crosscuts run in different directions on the 2828 and 3000 levels, hut have developed no ore, although some quartz bes been encountered containing a small amount of tbe precious metale. Enough has been done on those levels to convince anyone that no paying bodiee of ore are likely to bo found at tbose depthe.

The Utah mine is now down to the 2500 level, and no ore has heen developed in any portion of the mine. Crosscuts and drifts have been run from the vertical shaft and inclines. A cross drift ie now heiog rnn eaet from the bottom of the incline (2500 level), and no ore hae as yet heen found. The Sierra Nevada hae no developed ore of any value on the 2500 level, although a large amount of exploitation bas been done. The joint Sierra Nevada and Union Con. winze ie down to the 2800 level, and but little ore hes heen found. It ie boped that the Union Con. may develop ore on the 2700 level; but I think the chancee are that it will not be found that will pay the expense of extracting and milling. The Ophir and Mexican have a joint winze that hae heen sunk from tbe 2500 level to the 2910 level, and a cross-drift has been run east from tbe 2900 level of the winze several hundred ft., and no ore hae been encountered, although a large amount of promiseing vein material has been passed through. The California and Con. Virginia have gone at eome depth below tbe 2500 level, and have made no development of ore. The Best & Belcher and Gould & Curry have extended their exploration to a depth of 2118 ft. and have not eucceeded in finding ore. As yet the Savage, Hale & Norcroes, Chollar and Potosi have found no ore on the 2400 level, although there hae bsen no search for it, beyond runuing a drift from the combination shaft (a drain shaft for those mines). What little ore the above mines have had helow the 1000 level has been of low grade. The Julia and Bullion that bave heen eonk on to the depth of about 2500 ft., have bad no ore in any of their levels from the snrface. The Crown Point and Belcher have carried their workings down to the 3000 level, and no ore of velne has been developed. The Belcher company still hold ont the idea that they will have ore on the 2800 and 3000 levels, bnt I am of the opinion that they will not, except it may be small stringers that will not amount to much.

From the experience in the Comstock mines, I am forced to believe that it is useless to go below a depth of 1600 ft to look for bodies of paying ore. Tbat being the case, would it not be more reasonable to csase working to so great depth as has been attained, and turn the attention of capitaliete to developing new minss, wbich coold be done at much less expense and with a more certain prospect of an adequate return from them. There is a large amount of promising ground in tbis section of the country for the development of mines, that with comparatively a small amount of money expended upon them. The Regent mine, in Silver City, ie a sample of what may be expected from opening new minee. They have taken out a large amount of ore that has paid all expenses, and returned a good profit, and only from a depth of 140 ft. and above that. Since the 200 level has been reached, the quality of the ore hee been much better than that taken out above. West of the old Ophir croppings, a man by the name of Rowe, made a discovery of a rich vein of ore not far below the surface. When the Ophir company found it out, they claimed it and attached the ore he had out, and brought suit for damage, for tbe emount that he had realized from ore that he had milled. The man Rowe became frightened and took a certain amoont of money to abandon the ground, giving it up to the Ophir company. To the publ c it makes no difference ae to whom the gtoond where thie discovery was made belongs to. But the Iowa company, whose mining ground wae located west of the Comstock claim, that the discovery is on their ground, and I think are prepared to show it. They have run a drift eouth from their shaft on the 200 level that will bring them directly under the point of the discovery, and where the Ophir company are taking out ore. In the preliminary survey of the Ophir, preparatory to making an application for a patent, the west boundary line was fixed about 600 feet west of the west wall of Cometcck, whereas it ehould have been the west wall of the Comstock instead. The Iowa company protested against a patent being issued according to their eurvey. The Commissioner of the General Land Office at Washington refosed to consider the protest, on the ground that it was not filed within the time prescribed by law, notwithetanding the Ophir Company'e application *specifically* set forth that it claimed only such eurface ground as lay within the walls of the Comstock, and that the Iowa company, relying upon the supposition that the Government would not grant anything more than was asked for, when hy so doing it would clond the title of another claimant to mining ground west of the Comstock, and knowing that the gronnd as originally claimed and applied for did not conflict with the Iowa company'e mining claim, which was tbe reason why the Iowa company did not file its protest within the 90 days then allowed by law after the filing of the Ophir application. But upon the solving of the mystery ae to the locality of the west wall of the Comstock by this final snrvey of the Opbir company, it was too late for the Iowa company to assert its rigbts to ite property, upon which it had expended a large amount of money, notwitbstaoding the fact that the Ophir claim, as applied for in ite application, did not conflict with the Iowa company'e ground, and the furtbsr fact, that within 30 days after the final survey had virtually located the west wall of the Comstock 600 ft. west of its true position, and the Iowa company was then for the first time mede aware of the fact that tbe Ophir company wanted to extend its west line 600 ft. farther west than it had asked in ite application, the Iowa company *had filed its protest*. An appeal was taken hy tbe Iowa company from this decision of the Commisaioner to the Secretary of tbe Interior, who held that the Ophir mining company was only entitled to the ground asked for in its application for a patent, and tbereupon ordered thet a patent be issued for the ground claimsd by said company, but that a reeervation clause be inserted therein to the effect that no ground lying west of the west wall of the Comstock was intended to he conveyed by eaid patent. The Iowa company have ascertained the fact by actual development, that the west wall of the Cometock ledge lies about 600 ft. east of west line of tbe Ophir company's final survey, and about 300 ft. east of the Rowe development. The Iowa company have set up a claim to the ground, and notified the Ophir company to desist from treepassing thereon, preperatory to bringing a suit for posseeeion and damages. The Iowa company seem to have a valid claim to that ground and should hold it.

EVERY miner ought to he in possession of the MINING AND SCIENTIFIC PRESS of the 17th. That number of the PRESS is twice its usual size, and contains much important information which should be read hy every miner. Send 10 cents in stamps to Dewey & Co. for a copy. You will never regret it.—*Georgetown Gazette.*

ONE difference between mining on tbe Comstock and mining in Arizona is that on tbe Cemetock to strike water is a calamity, and in the latter it ie considered equal to etriking a big body of ore. Water commands a price in Arizona.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING DECEMBER 20, 1881.

251,013.—HAY UNLOADING AND STACKING APPARATUS—Jos. C. Austin, Imusdale, Cal.
251,021.—GAS RUNNER—Wm. M. Blaine, Salinas, Cal.
251,337.—DESK—J. H. Burrows, Boise City, I. T.
251,023.—TRANSOM ADJUSTER—B. H. Carter, Oakland.
251,201—WASHING MACHINE—M. J. Fenwick, Cottage Grove, Or.
251,034—FOOTSTOOL FOR ROCKING CHAIRS—Ferdinand Franz, S. F.
251,044—ORE CRUSHER AND GRINDER—Wm. Gutenberger, Sacramento, Cal.
251,114—WIRE ROPE AND CABLE—A. S. Halldie, S. F.
251,045—ATTACHMENT FOR CLEANING-SHOES OF THRASHING MACHINES—H. Hamilton, Visalia, Cal.
251,115—BUCKBOARD WAGON—J. Hansel, Stockton, Cal.
251,054—PAINT COMPOUND FOR METALLIC SURFACES—Eugene Jones, Gold Hill, Nev.
251,119—FIELD THRASHER—H. Jory, Marysville, Cal.
9,985 (re-issue)—ARTIFICIAL TOOTH—C. H. Mack, Walla Walla, W. T.
251,264—STAMP MILL—Jas. F. Marvin, Ft. McDowell, A. T.
251,127—PICTURE FENDING DEVICE FOR MAGIC LANTERNS E. J. Muybridge, S. F.
251,237—PLOW—C. H. Remington, Gilroy, Cal.
251,060—PIANO STOOL—S. W. Shaw, S. F.
251,070—SASH FASTENER—S. W. Shaw, S. F.
251,302—HYDRAULIC MOTOR—W. J. Silver, Salt Lake City, Utah.
251,076—FAUCET—M. Tommasi, Smith's Ranch, Cal.
251,145—EXPLOSIVE COMPOUND—G. von Planitz, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'e SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of especial mention:

WIRE ROPE AND CABLE.—A. S. Hallidie, S. F. Dated Dec. 20, 1881. No. 251,114. Mr. Hallidie's invention refers to tbe wire ropes need in hoisting, haulage, transmitting power, and for similar purposes. The ordinary method of making wire ropes ie to twiet or lay together cylindrical wiree of the same metal into strands, or to lay or twist theee etrands together to form a rope. Ropea made in this manner, when eubjscted to considerable friction or pressure, have the exterior wires compoeing them very much flattened and worn upon their outer eurfaces, and on account of thie wear the strands break, and the rope becomes stranded. Mr. Hallidie propoees to lay the straude of the rope in euch a manner that tbeir exterior sorface shall approximate in form the curve of the circumference of the rope, thus producing a more eolid and compact rope, with a eurface less sueceptible to wear, and presenting less irregularities to be acted upon. Mr. Hallidie has also applied for a patent for a machine for flattening the wires.

HAY UNLOADING AND STACKING APPARATUS. Joseph C. Austin, Imuedale, Monterey Co., Cal. Dated Dec. 20, 1880. No. 251,018. Thie invention relates to certain improvments in that clase of apparatns by which hay or similar substancee may be removed from a wagon to a barn or etack. It consists in certain detaile of conetruction hy which loads of hey may be removed from the wagon, carried the whole leogth of the harn and forcibly deposited at the oppoeite end of tbe barn from tbe wagon at a single operation. Eacb euccessive load ie transferred to the top of the precsding one, until the end of the barn is foll. The next section is then filled in the eame manner and eo on in succession nntil tbe whole barn bes been filled from the eingle entrance at one end.

PAINT COMPOUND FOR METALLIC SURFACES. —Eugene Jones, Gold Hill, Nev. Dated Dec. 20, 1881. No. 251,054. This invention relatse to a compound which is used for covering wire ropes, euch as are employed for mining purposs, rigging of shipe, cahle railroade and in other placee. It can also be put on ships' bottome, water pipee and other metallic surfaces. The object of the compound is to prevent corroding or crystallizing of the article on which it is placed, either when need under water or exposed to the atmosphere. It will he specially useful in cables in the shafte of wet minss.

ATTACHMENT FOR CLEANING SHOES OF THRASHING MACHINES.—Hugh Hamilton, Visalia. Datsd Dec. 20, 1881. No. 251,045. This invention relates to that claee of agricultural implements known ae thrashing machines, and more especially to certain improvemente thereon, conesting of an attachment for the cleaning ehoes to prevent the riddles being choked up with straw.

EXPLOSIVE COMPOUND.—Guetav von Planitz, S. F. Dated Dec. 20, 1881. No. 251,145. This ie a novel compound as a base for blasting and other powdere, and relates also to a procese for preparing the seme. It coneiete in combining nitric acid with reein under peculiar circumetances, which cauese a decomposition and the formation of an entirely new acid compound,

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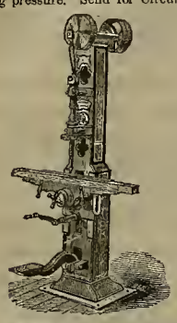

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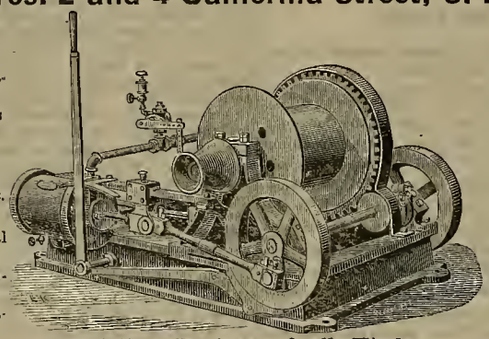
Williamson Bros. Hoisting Engines.
New Haven Machine Co.'s Machinists' Tools.
Otto Silent Gas Engines.



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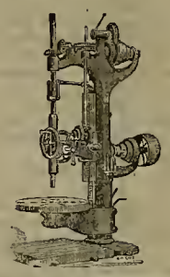

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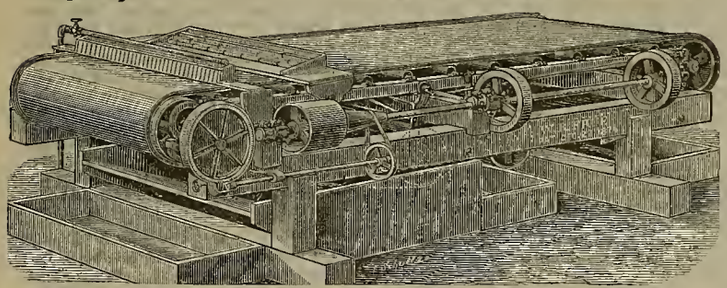

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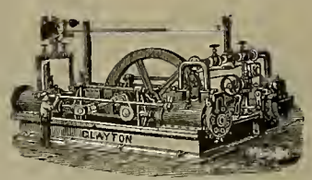

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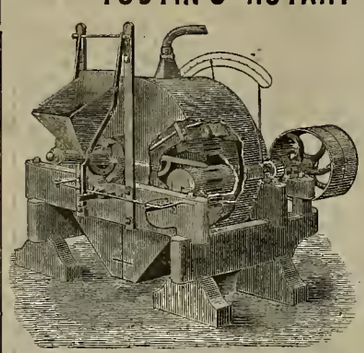

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Ores Worked by any Process.
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Analyses of Ores, Minerals, Waters, Etc.
Working Tests (Practical) Made.
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Special attention paid to Examinations of Mines, plans and reports furnished.
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MINE and MILL SUPPLIES,
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We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.
Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
☞Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.
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ALEX. DEL MAR,
Mining Engineer,
Late Director of the United States Bureau of Statistics Mining Commissioner for the United States Monetary Commission, etc., No. 216 Sansome St., San Francisco. Cable address—"Del Mar, San Francisco." Branch Office, 61 Broadway, New York. Cable address—"Del Mar, New York." London Agency: H. Stodes & Co, 24 A, Southwark St., S. E. Cable address—"Del Mar, London." Paris Agency: J. H. McDonald & Co., 13 Rue St. Lazare. Cable address—"Del Mar, Paris."

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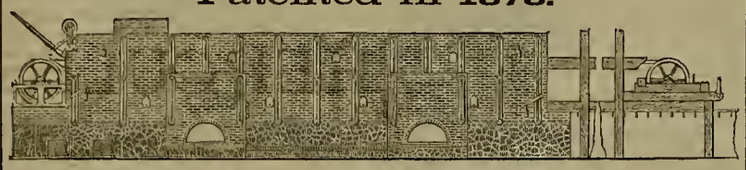
NOTICE.
The office of the STETEFELDT FURNACE CO., having been removed to New York, parties wishing to obtain information in San Francisco about the Stetefeldt Furnace will apply to Messrs. Prescott, Scott & Co., Union Iron Works, San Francisco. C. A. STETEFELDT.

SHEET IRON PIPE.
FRANCIS SMITH & CO.,
Manufacturers of
THE PATENT CHANNEL IRON WHEELBARROWS.
THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand
SHEET IRON PIPE.
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Artesian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.
Office and Manufactory, 130 Beale Street, San Francisco.
SHEET IRON PIPE.

THE O'HARRA
CHLORIDIZING FURNACE.
Patented in 1878.



SIDE ELEVATION OF THE O'HARRA FURNACE.

This Furnace is Constructed with two SEPARATE HEARTHS, one for DESULPHURIZING and one for CHLORIDIZING the Ore.
BOTH PROCESSES ARE PERFORMED AT ONE OPERATION.

An endless chain carrying conveyors or scrapers passes continuously through over both hearths, going one way through one chamber and the other through the other chamber. By this means the ore is fed and discharged at the same end of the furnace.
A cheap Furnace to build and to run.
The process is essentially the same as the well-known Freiberg process; but the mechanical devices applied to the furnace and the peculiarity of its construction enable the inventor to thoroughly desulphurize and chloridize the ore to a higher percentage than other furnaces, and with less cost for fuel and labor.
At Washoe and Ophir Tailings Mill it costs $1.10 per ton to work 40 tons in 24 hours.
At the Exchequer Mill, Alpine County, 20 tons are worked in 24 hours, at a cost of $2.61¼.
Lewis Chalmers, of the Isabella O. & S. M. Co., Silver Mountain, Alpine Co., says: The O'Harra Furnace did all that is represented in the MINING AND SCIENTIFIC PRESS, roasting and chloridizing at the figures thoro given, antimonial and arsenual sulphurate of silver up to from 84% to 95% of the assay.
SEND FOR DESCRIPTIVE CIRCULAR TO
WHITNEY, VEASEY & CO.,
Carson City, Nevada.
Agents for San Francisco, KUSTEL & CO., 318 Pine Street.

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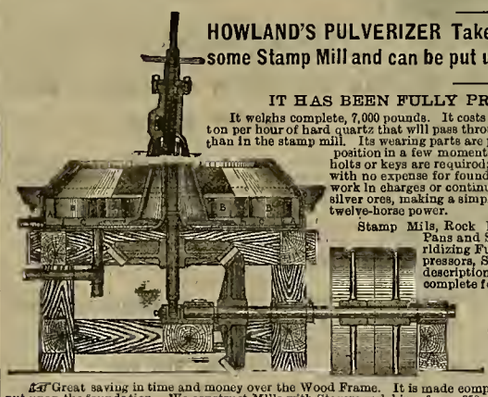
MANUFACTURERS OF
Gold and Silver Grinding and Amalgamating Machinery



HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.
IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies. Iron Work complete for Wood Frames, also
SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.
☞Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
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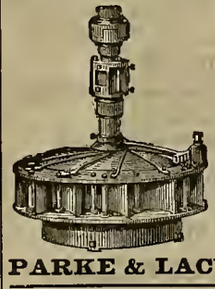

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The "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.
Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
JAMES LEFFEL & CO., Springfield, Ohio,
and 110 Liberty St., N. Y. City.
PARKE & LACY, Sole Agents, 21 and 23 Fremont St., S. F.

STEEL CASTINGS
FROM 1-4 TO 10,000 lbs. WEIGHT.
True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
CRANK SHAFTS, SHOES, DIES and GEARING specialties.
Circulars and Price Lists free. Address
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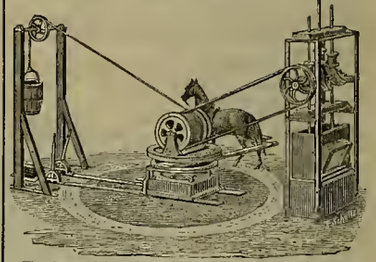
San Francisco Cordage Factory.
Established 1856.
Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice.
TUBBS & CO.,
611 and 613 Front Street, San Francisco

SELBY
SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.
Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
Agent and Manufacturer of Mining Machinery
38 and 40 Main St., S. F.

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F. VON LEICHT,
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☞Reports, Surveys and Plans of Mines made.☜

The Spring Valley Hydraulic Gold Mine.

[CONTINUED FROM PAGE 441.]

a veritable river 400 ft. wide and several feet deep. The water sheds which is drained by this canal, aggregates several hundred square miles.

At times of great floods it may he true that damage to lands and crops has occurred hy the breakage of the levees, but it should he borne in mind that the quantity of water which flows into the canal from the mine is not more than one 50th part of the water which finds its way into the canal during heavy storms. The company has expended hundreds of thonsands of dollars to prevent damage hy debris and must continue to expend large sums to maintain its levees.

It is thought hy some that the original plan should have been to have kept the mining water entirely separate from the natural drainage water of the country. Had such a system been adopted, it would have been much cheaper for the company and no damage hy floods could have been charged against it, but on the contrary low and sterile lands could have been made to produce abundant crops. At the present time parties owning low land contiguous to the canal are making arrangements to have it covered with slickens in order that it may become more productive. Thns the same deposit which the farmers in certain parts of the State are trying to prevent the miners from sending down upon their lands, claiming that it destroys all vegetation, is being sought after in this locality as the only material which will make the lands arable. The future prospects of the mine are very promising indeed. As soon as the tunnel is completed and the flumes put in, it is expected that the yield of gold will far exceed that of former years, and will he double the present output. Judging from the quantity and quality of gravel, and taking into consideration the splendid facilities for the future working of the mine, there is little doubt but that the hopes of the most enthusiastic of the owners are about to he realized, and that this mine will in the future he classed not only among the largest producing mines, but will he the best paying hydraulic mine in California.

News in Brief.

SMALLPOX is reported spreading in New Jersey.

TRAVEL is unusually light at present on the Virginia and Truckee railroad.

GREAT BRITAIN is said to have lost $1,000,000 in the last three years in crops.

THE San Jose fruit cannery employes 400 hands in the season, and puts up 2,000,000 lbs. of fruit.

ONE thousand men are wanted in the Yellowstone valley, M. T., for railroad work—wages $2 per day.

THE yield of potatoes of all kinds last year in Ireland amounted to 3.6 tons per acre, against 1.3 tons in the previous year.

NEWS from Magdalena, Mexico, is to the effect that work has been resumed on the Guaymas road, via the Magdalena route.

TRAVELERS report that in Africa there are falls on the Zambezi river 500 ft. high, or more than three times the hight of Niagara.

WITHIN the next twenty months Yavapai, A. T., expects 150 miles of railroad crossing that county, running from east to west.

THE noted Mullan Pass Tunnel, M. T., is to he 16 ft. wide, 20 ft. high, and 3,800 ft. long (about ¾ of a mile) through solid granite.

THE A. T. and S. F. surveyors are now running their lines from Tucson up the Santa Cruz to Calabesas, the end of the Benson and Calabesas road.

Business Offices and Sunny Rooms to Let.

We have some desirable rooms to let adjoining the offices of this paper which will be rented on favorable terms. Stair entrance, No. 252 Market St. Elevator, No. 12 Front St. Parties wishing offices, etc., will do well to call and see them. DEWEY & CO.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired), be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is repleto and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry O. Hanks, State Mineralogist.

REMITTANCES to this office should be made by postal order or registered letter, when practicable; cost of postal order, for $15 or less, 10 cts.; for registered letter, in addition to regular postage (at 3 cts. per half-ounce), 10 cts.

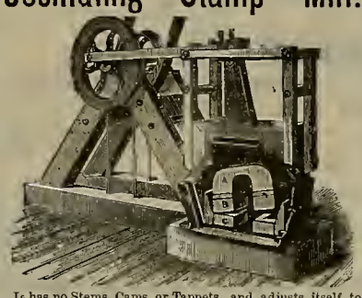
ANNUAL STATISTICIAN of 1881.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 816 California st. Price, $4

San Francisco Metal Market.

[WHOLESALE.
THURSDAY, December 29, 1881.

IRON.—	
American, Pig, soft, ton	— — @30 00
Scotch, Pig, ton	25 50 @27 50
American White Pig, ton	— — @—
Oregon Pig, ton	— — @29 00
Clipper Gap, No. 1	— — @28 00
Clipper Gap, White	— — @32 00
Clipper Gap Car Wheel	— — @35 00
Refined Bar	4 @
Horse Shoes, keg	— @ 5 50
Nail Rod	— @ 7½
Norway, according to thickness	6½@ 70
STEEL.—	
English Cast, lb	13 @ 15
Black Diamond, ordinary sizes	— @ 15
Drill	15 @ 16
Flat Bar	16 @ 18
COPPER.—	
Ingot	— @ 22
Sheet	— @ 20
Sheating, Tinned 14x18	— @ 31
Nails	— @ —
Bolts	— @ 33
Old	— @ —
Bar	— @ 22
Cement, 100 fine	— @ 15½
LEAD.—	
Pig	— @ 5
Bar	— @ 6
Pipe	— @ 8
Sheet	— @ 8
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES.—	
10x14 I C Charcoal	— @ 7 50
10x14 I C Coke	6 15 @ 6 40
Banca Tin	— @22 50
Australian	— @23 50
I. C. Charcoal Roofing 14x20	— @ 6 90
ZINC.—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS.—	
Assorted Sizes	4 00 @ 4 15
QUICKSILVER.—	
By the flask	@37½ 41
Flasks, new	— — @ 1 25
Flasks, old	— — @ 1 05

HUNTINGTON'S Oscillating Stamp Mill.



It has no Stems, Cams, or Tappets, and adjusts itself to the wear of the Shoes and Dies.

For simplicity, economy, durability and effective working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power. Awarded First Premium and Medal at Mechanics' Fair, S. F., 1880.

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Improved Patent Grinding and Amalgamating Pans, Concentrators and Gold Amalgamators; also, Steam Engines and Mining Machinery of all kinds. Send for circulars.

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DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half-year ending December 31st, 1881, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a dividend on Term Deposits at the rate of Five (5) per cent. per annum, and on Ordinary Deposits at the rate of four and one-sixth (4 1-6) per cent. per annum, free from Federal Taxes, and payable on and after the 9th day of January, 1882. By order,
GEO. LETTE, Secretary.

F. MANSELL & CO.,
Sign and Ornamental Painters,
Removed to NO. 434 PINE ST., S. F.
(Opposite their old stand.)

THOS. PRICE'S
Assay Office and Chemical Laboratory,
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KNIGHT WATER WHEEL.
All sizes of this Superior Wheel furnished at the shortest notice. Send for circulars to
ALMARIN B. PAUL, Agent.
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E. MAIN, 315 Folsom Street,
Makes to order Gents' Fine French Calf Boots from $6 to $10; Gaiters from $3 to $6; Alexis from $3.50 to $5; Mens' Heavy Kip Boots, $6; Oxford Ties, French Calf, $4; California Leather, $3.50; Men's Working Shoes from $2.50 to $3; Children's Shoes made to order. Persons in the country ordering to the amount of $12, I pay the express charges. I sell nothing but my own manufacture.

HERCULES SLAYING THE GIANTS.

HERCULES POWDER

Derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

No. 1 (XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade

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Special Attention Paid to Patent Law.

N. B.—Mr. J. L. Boone, of the above firm, has been connected with the patent business for over 15 years, and devotes himself almost exclusively to patent litigation and kindred branches.

AN INTEREST IN A VALUABLE MINE FOR SALE.

The whole or part of the ECLIPSE GOLD QUARTZ Mining Company, for sale. The Keystone mine adjoins it on the south. It is situated in Amador City, Amador Co., and the title is protected by U. S. Patent. None but people of means need apply for full particulars, etc. Address G. W. KLING, Amador City, Cal.

WM. H. BELLOWS,
CONSTRUCTOR OF
Flumes and Ditches for Lumbering, Mining, Irrigation, or other purposes.
Routes Surveyed, Estimates furnished, etc, etc.
OFFICE—430 California St., San Francisco.

Reardon's Patent Pick.
This Pick has adjustable points, all steel and for prospecting purposes. It can be used as a Pick, Hammer and Hatchet; for farmers used as a Pick, Hammer and Mattox. For mining purposes it will save more than one-half of the expense. Address
P. W. REARDON,
Box 160 San Jose, Cal.

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Send for Circular.

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CAR WHEELS, from A. Whitney & Sons.
RAILROAD IRON, SPIKES, BOLTS, Etc. } FROM BEST EASTERN MAKERS.
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Several Good Dividend Paying
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Apply to
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Branch offices in New York, Boston, Philadelphia, Chicago, St. Louis, and London, England.
Only mining properties of ascertained value negotiated.
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1851. 1881.
DEPUTY U. S. MINERAL SURVEYOR.
Surveys for Location or Patent. Maps and Plans Drawn. Mining Properties of all kinds examined and careful reports made of the same. Consultations on Mining Investments. Address, THOS. W. REECE, CIVIL ENGINEER, Oroville, Butte Co., Cal. References given and required.

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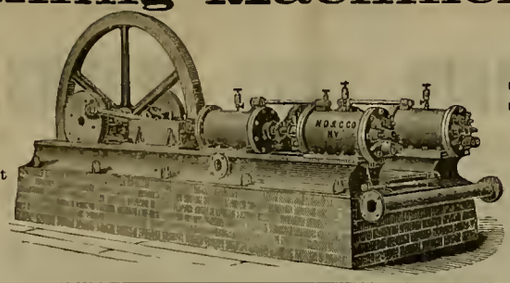
No. 49 Fremont Street, San Francisco, Cal.,

MANUFACTURERS OF AND DEALERS IN

Mining Machinery.

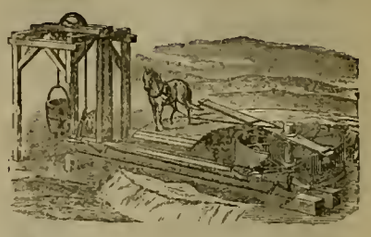
We manufacture the BEST **Air Compressor** Ever driven by belt from Water Power.



Hoisting Rig.

DONKEY ENGINES For Pile Driving.

MINING CARS, Ore and Water **BUCKETS.**



MINERS' HORSE-WHIM.

One Horse can easily hoist over 1,000 pounds at a depth of 500 feet. The Power is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing

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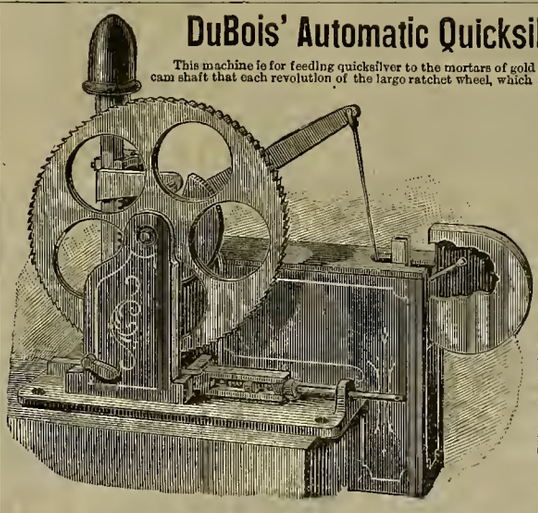

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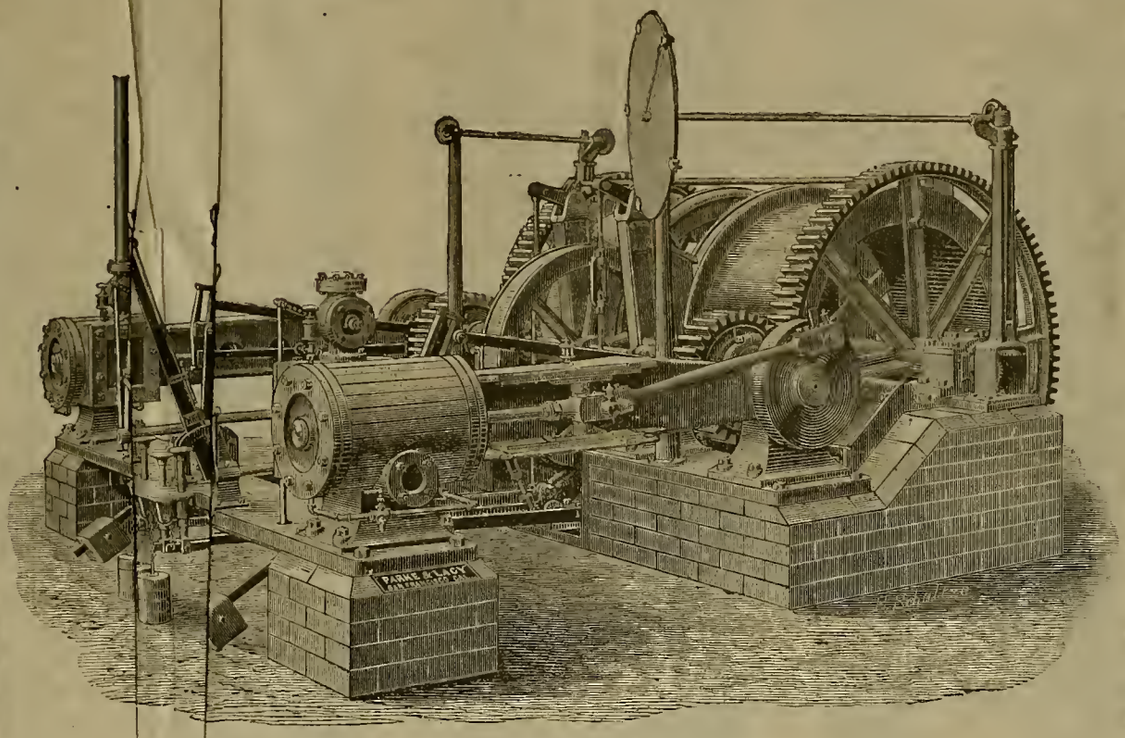

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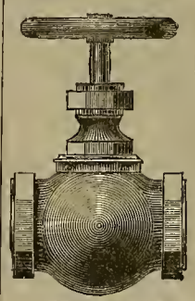

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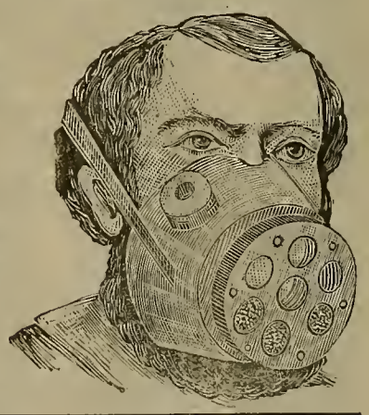

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